# 1AC

## 1AC---Technology

### 1AC---Innovation ADV

#### Contention 1 is Innovation.

#### The unmoderated, permissive nature of present merger policy sanctions Big Tech to engage in predatory behavior that disrupts Schumpeterian competition.

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1. Introduction

Commentators across the political spectrum have called for new and more forceful approaches to antitrust enforcement with respect to Big Tech—especially Amazon, Facebook, and Google. A wide range of proposals have been put forth, including breaking firms up, subjecting them to pervasive regulation, and being much more wary of mergers between incumbents and either recent or potential entrants.1 The last concern is driven, in part, by the combination of apparently dominant market positions coupled with large numbers of acquisitions. For example, Amazon is estimated to have accounted for almost 40 percent of all 2019 ecommerce sales in the U.S., and Facebook and Google together account for over 60 percent of U.S. digital ad spending.2 These companies made hundreds of acquisitions in the previous decade.3

To determine if acquisitions by Big Tech are a big problem that justifies heightened or different scrutiny, it is useful to begin by asking: what is special about these firms, beyond their tremendous success? One answer is that all are in industries with very strong increasing returns and positive feedback loops. There are several sources of increasing returns—often present simultaneously. One source is network effects. Another is the collection and use of big data, which can give rise to economies of scale, scope, and experience. Lastly, the creation of software and intellectual property (including proprietary hardware designs) is typically characterized by large economies of scale, with high fixed costs and very low marginal costs.

The presence of such strong increasing returns can limit the number of viable competitors and even create a tendency to tip toward monopoly. When increasing returns are large relative to product differentiation, competition may be for the market rather than in the market. Competition for the market, whereby firms compete by innovating to attain temporary market dominance, is often referred to as Schumpeterian competition.

The need for scale can make entry difficult in the very markets in which entry is critical because competition takes place for the market. In a market in which a large base of users is essential to a firm’s ability to offer an attractive value proposition—say because network effects are strong and/or the value of user big data is high—the only economically viable means of entry may be to build up a base of users in an adjacent market and then provide the new service to that base of users—what is sometimes called a two-stage entry strategy.4 Some commentators believe that Instagram and WhatsApp would have used two-stage entry to become strong competitors to Facebook in social networking if that firm had not acquired them in 2012 and 2014, respectively.5

Another strategy, to use alone or in conjunction with two-stage entry, is to offer a product with higher quality than that of the incumbent firm. Most directly, an entrant’s quality advantage may outweigh its scale and installed-base disadvantages. There can also be an indirect effect. In markets subject to strong network effects, a firm may gain significant competitive advantage from favorable consumer expectations—when consumers expect that firm to have high sales, their expected value of patronizing that firm rises due to the anticipated network benefits associated with a larger user base. One might expect incumbents generally to have expectations advantages. However, a highly visible innovation might tip expectations in favor of an entrant.6 \*\*\*FOOTNOTE BEGINS\*\*\* Farrell and Katz (1998) provide an early analysis of the role innovation can play to facilitate entry by shifting consumer expectations in markets with network effects. \*\*\*FOOTNOTE ENDS\*\*\* If this pattern prevails, then leapfrog innovation might allow an entrant that is small today to generate a positive feedback cycle and overcome an incumbent’s various scale advantages.

Both two-stage and innovative entry strategies require the entrant to amass complementary resources (e.g., users and intellectual property) to have a chance of overcoming the advantages of incumbency. An entrant also needs a strong growth trajectory that allows it to achieve viable scale. An entrant’s need to acquire complementary assets and attain a promising growth trajectory may allow an incumbent to identify potential rivals before they become major actual competitors.

Below, I explore the role of merger policy in a model in which competition is for the market and an incumbent can identify—and merge with—an emerging or potential competitor before the entrant becomes the new dominant firm. After Section 2 briefly reviews related literature, Section 3 presents the overall analytical framework: a discrete-time, infinite-horizon game in which each period a new potential entry opportunity arises with exogenous probability. Entry requires making a sunk investment in product development. If entry occurs and the firms do not merge, then the incumbent and entrant compete for the market, and the market is ultimately monopolized as one of the firms is driven to exit.

Section 4 argues that incumbents’ acquisitions of emerging or potential competitors should be subject to heightened antitrust scrutiny when competition is for the market. Entry is a critically important means of promoting market performance under Schumpeterian competition but acquisition of a nascent competitor can be an especially effective way to avoid Schumpeterian competition, to the detriment of consumers. Marino and Zábojník (2006) have shown that, when competition is in the market (i.e., multiple incumbents can be profitable simultaneously), the threat of rapid entry can sometimes serve as a substitute for merger policy by making merger unprofitable absent efficiencies. To see why, suppose that there are two incumbents. In the absence of additional entry, merging to monopoly raises profits by eliminating product-market competition. However, there can be an offsetting share-dilution effect: when the two firms merge, they may create room for a subsequent firm profitably to enter the market because they weaken their bargaining position—instead of collectively receiving two-thirds of the continuation profits in symmetric bargaining over merger with the entrant, they receive only half. When subsequent entry is rapid, the share-dilution effect renders mergers unprofitable absent efficiencies. By contrast, there is no share-dilution effect when competition is for the market: even absent merger, the market is monopolized after a period of competing for dominance following entry. Because it eliminates a period of competition to be the dominant firm, merger is profitable even if ensuing entry is rapid.

Sections 5-8 examine the effects of merger policy on potential entrants’ pre-merger innovation incentives. When mergers are banned, entry occurs only when a potential entrant has a sufficiently valuable innovation that it can overcome any incumbency advantages and become the new dominant firm. As Rasmussen (1988) identified, when mergers are feasible, a firm may enter the market solely to induce the incumbent to purchase the entrant in order to avoid dissipating product-market profits through competition—so-called entry for buyout.7 \*\*\*FOOTNOTE BEGINS\*\*\* Entry for buyout can occur even if the entrant could otherwise become dominant—competition to attain that position could prevent the firm from recovering its entry costs. \*\*\*FOOTNOTE ENDS\*\*\* It is often argued that a benefit of allowing mergers is that, by facilitating entry for buyout, they can promote innovative entry.8 Below, I show that allowing mergers can also discourage entrant innovation.

As long as the incumbent’s actions conditional on not merging are independent of whether mergers are permitted, the option to merge can only increase an entrant’s profits. This finding, however, does not imply that this option everywhere increases an entrant’s incentives to marginally improve its product. In fact, the possibility of merger may diminish innovation by increasing the relative profitability of entering with a less ambitious product. Moreover, the option to merge might reduce an entrant’s profits by facilitating incumbency for buyout, whereby an incumbent invests in strengthening its competitive position solely to induce the entrant to merge on more favorable terms. Finally, a permissive policy that also applies to future mergers can reduce a current entrant’s profits by facilitating entry for buyout by subsequent entrants.

Section 5 analyzes the effects of merger policy on an entrant’s incentives to invest in marginal product improvements. When there is no incumbency for buyout and certain other conditions are satisfied, an entrant’s disagreement profits when bargaining over whether to merge equal its profits when mergers are banned. Hence, the difference between the entrant’s profits with and without the possibility of merger equals the entrant’s share of the gains from merger. The effect of permissive merger policy on innovation incentives thus depends on how a change in the entrant’s product quality affects those gains. In general, increasing the entrant’s product quality can raise or lower the gains from merger, which implies that option to merge can raise or lower an entrant’s incentives to invest in quality.

The analysis summarized above relies on reduced-form profit functions. Sections 6-8 present examples in which product-market competition is explicitly modeled. These examples illustrate how permissive merger policy can harm innovation incentives and that the competitive effects of mergers can be complex and highly fact specific. The example of Section 6 exhibits same-side network effects, such as arise with social networks. Among other things, this example demonstrates that, in situations where the merged firm retains the older technology (to avoid splitting users and losing network benefits), an increase in the entrant’s product quality lowers the gains to merger. Intuitively, the higher is the entrant’s product quality, the greater the opportunity cost of not using it. The example of Section 7 considers a market without network effects in which a firm must make a new investment each period in order to be an active seller. In this example, the entrant chooses a higher product quality when mergers are banned because the possibility of merger leads the entrant to put weight on the effects of its innovation on monopoly profits, which are less sensitive to the entrant’s quality than are the profits the entrant earns when competing with the incumbent. Section 8 shows by example that permissive merger policy can facilitate incumbency for buyout that discourages innovative entry.

Section 9 discusses some policy implications of this analysis. Although acquisitions of emerging competitors in Schumpeterian markets should be subject to heightened scrutiny generally, in some cases merger promote innovation and efficiency. It is thus important to examine the facts of each case at hand even if doing so is difficult.

Finally, a technical appendix examines a benchmark case of imitative entry to compete in the market, which serves as a benchmark for the text’s model of innovative entry to compete for the market.

2. Related literature

Before turning to the analysis, it is useful to put it in context and discuss related literature. The model presented below is not intended to apply to all Big Tech mergers.9 It is highly unlikely that the Big Tech incumbents considered each of the hundreds of firms they acquired to be a significant potential competitor, and any given incumbent may have a variety of motives underlying different acquisitions. For example, some commentators are concerned that a digital platform can expand into various industries that rely on it and then create artificial advantages for its subsidiaries while harming competition from rivals to those subsidiaries. Variants of this complaint have been made against Amazon Basics, Google Shopping, and Apple apps sold on its App Store.10 My focus is on mergers aimed at preventing successful entry into a firm’s core market(s), rather than mergers that allow a firm to expand into other markets. The latter type of merger is more appropriately analyzed using models developed in the literature on vertical mergers. Church (2008) surveys the main theories relevant to vertical mergers, and Slade (2020) surveys empirical studies of the effects of vertical mergers.

Big Tech firms often operate multi-sided platforms, which can have strong implications for the welfare effects of a merger. Recent analyses include Anderson and Peitz (2020) and Correia-da-Silva et al. (2019), and Foros et al. (2015) and Jullien and Sand-Zantman (2020) offer surveys of the two-sided merger literature. Below, I abstract away from multi-sidedness and focus on the implications of strong increasing returns.

There has been a long and inconclusive debate regarding the general relationship between horizontal mergers and innovation. See, for example, Baker (2007), Jullien and Lefouili (2018), Katz and Shelanski (2007), and Shapiro (2012), and the papers cited therein. This literature tends to be concerned with the effects of merger on the level of post-merger innovation. By contrast, I consider situations in which innovation is necessary to launch an entry attempt, and I focus on the effects that the prospect of merger has on premerger innovation incentives.

Several recent papers also consider premerger incentives.11 Cabral (2020), Letina et al. (2020), Motta and Peitz (2020), and Hollenbeck (2020) all find that prohibiting mergers can reduce innovation by reducing entry for buyout. The first three papers all examine models in which additional investment increases the probability that an innovation project is successful but does not affect the outcome conditional on success.12 Hence, the possibility that merger discourages entrant investment in marginal quality improvements does not arise. Hollenbeck (2020) considers a computational oligopoly model in which entrants’ investment decisions do affect their marginal product qualities, but for the functional forms that he utilizes, he finds that the prospect of merger never decreases entrants’ innovation levels.

Kamepalli et al. (2020) also examine the effects of merger policy on premerger innovation. They find that permissive merger policy can reduce entrant innovation but for a reason very different than the ones I identify below. Specifically, Kamepalli et al. examine a market subject to network effects in which prospective early adopters shy away from an entrant that they believe will be merged out of existence.

Finally, Bryan and Hovenkamp (2020) examine a model of startup acquisitions by duopoly incumbents in which a startup does not have the ability to enter the market. Although related, the analysis focuses on the effects of exclusive licensing rather than the elimination of a potential Schumpeterian competitor that I examine.

3. The model

I explore the effects of merger policy by examining Markov perfect equilibria (i.e., subgame perfect equilibria in which players’ strategies depend only on the current, payoff-relevant state variables) in the infinite-horizon game illustrated in Fig. 1 below. Firms and consumers have a common per-period discount factor, δ. The structure of the game and specific parameter values are common knowledge.

At the start of each period, any existing incumbent chooses whether to remain active in the market. Then a new potential entry opportunity arrives with exogenous probability, ρ¯. An opportunity can be thought of as arising due to the discovery of a new generation of product or process technology that is proprietary to the potential entrant. When a new generation arrives, the potential entrant associated with that generation chooses how much to invest in developing the new technology, where greater investment leads to higher quality.13

Let qk(I) denote the quality level obtained for the generation-k technology when the entrant invests I. qk(I) is assumed to be increasing in k as well as I. To simplify the notation, equate each technological generation with the corresponding period index. That is, generation k refers to the technology that allows entry commencing in period k. This notation implicitly assumes that generations advance over time independently of both whether an entry opportunity arises in a particular period and what amounts that entrants have invested in past generations. Once a given generation of technology has arrived, it does not improve (i.e., for a given k, qk( · ) does not change with the passage of time), and there is only a single entry opportunity for any given firm: a firm must either choose to enter when an opportunity arises or otherwise stay out forever.

Conditional on having an entry opportunity and choosing to enter, a generation-l entrant facing an incumbent with product quality qf chooses investment I to maximize

[Equation omitted]

where VE l (qf, ql) is the expected discounted productmarket profits that will be earned by a generation-l entrant with quality ql facing an incumbent with quality qf. 14 One can think of f as standing for “follower” and l standing for “leader” because the entrant relies on the leading technology. Assume that that there is a unique optimal investment level conditional on the incumbent’s quality, I E l (qf), with associated quality level qE l (qf) ≡ ql(I E l (qf)). The potential entrant chooses to enter the market if

[Equation omitted]

and will stay out of the market otherwise (with I = 0). Let ρE l (qf) denote ρ¯ times the conditional probability that entrant with generation-l technology will enter if the opportunity arises and there is a single incumbent having quality qf.

After the entry decision, any incumbents and the entrant (if there is one) choose whether to merge, which generates a new state of the market. A merger is assumed to take place whenever doing so maximizes the net present value of the merging parties’ joint profits. The exit, entry, and merger decisions occur sequentially but instantaneously, followed by a production period. The next period repeats this structure.

I consider settings in which, if entry occurs and the incumbent and entrant do not merge, then they compete for the market for one period, after which one of them exits the market. The losing firm puts up a fight for one period before exiting because it has a depreciating asset (e.g., consumer brand, installed user base, or plant and equipment) in which the firm stops investing after entry but that has sufficient residual value for the firm to constrain the winner’s pricing for one period.15 Once the loser has exited the market, it exerts no competitive pressure.16

[Figure omitted]

Let πI t(qf, ql) and πE t (qf, ql) denote the per-period profits of the incumbent and entrant, respectively, when they compete for the market in period t with products having qualities qf and ql, respectively.17 These profit functions may also reflect horizontal product differentiation as long as that differentiation is insufficient to allow the firms to coexist profitably.18 After one firm has exited the market, the remaining firm earns π M t (qk ) per period until the next entry event occurs, where k ∈ {f, l} denotes the winner’s technology

Assume that maxI πE t (qf, ql(I)) − I < 0, so that it is unprofitable to enter the market, lose the competition for the market, and exit. Given this assumption, and because the model is deterministic with respect to product-market competition, entry occurs only if the entrant anticipates either winning the competition for the market or merging.19

If entry occurs and the incumbent and entrant merge, then the combined firm earns πT t (qf, ql) in the entry— or “transition”—period given the incumbent’s and entrant’s product qualities. The transition period reflects lags in redeploying competitive assets (e.g., brands, installed bases, or physical plant). The merged firm earns π M t (qk ) per period in subsequent periods until the next entry event occurs, where k ∈ {f, l} is the technology that the merged firm chooses to adopt going forward. The assumption that the merged firm has to choose one or the other technology is consistent with my focus on effects that arise when mergers do not generate productive efficiencies.

Even absent merger efficiencies, there is private incentive to merge to avoid dissipating profits through competition: both πT t (qf, ql) and max k∈{f,l} π M t (qk ) are assumed to be larger than πI t(qf , ql) + πE t (qf , ql).

4. Acquisitions of emerging competitors: a case for heightened scrutiny

As described in the Introduction, to be successful, an entrant needs to amass complementary resources (e.g., users and intellectual property) to overcome any incumbency advantages, and it needs a strong growth trajectory to achieve viable scale. The entrant’s need to acquire complementary assets and attain a strong growth path may allow an incumbent to identify and acquire a potential rival before it has entered into direct competition with the incumbent, or while the entrant still has a very small share of the market in which the incumbent competes.20 This possibility challenges the traditional antitrust approach to assessing mergers in the U.S., under which it is difficult to prevail in court when trying to block a merger based solely on the loss of potential future competition.21 \*\*\*FOOTNOTE BEGINS\*\*\* See, e.g., Bush and Massa (2004) and Werden and Limarzi (2010) for discussions of relevant cases. In addition, the lack of assets or sales may result in a transaction’s falling below the thresholds that trigger mandatory notification of antitrust authorities. (See Wollman (2019).) \*\*\*FOOTNOTE ENDS\*\*\* Moreover, the earlier the dominant firm can identify such a rival, the more problematical the outcome is for competition policy—both because the earlier a merger involving a nascent or potential competitor occurs the harder it is to challenge and because such a merger allows the firms more fully to avoid competing.

Although the conditions just described make it particularly difficult for antitrust enforcers to challenge acquisitions, these conditions also make it particularly important that enforcers do so: absent entry and dynamic competition, there will be little competition at all. Moreover, when competition is in the market, the share-dilution effect described in the Introduction and illustrated by Proposition A.2 in the Appendix can serve as a substitute for antitrust enforcement in limiting inefficient mergers.22 By contrast, when competition is for the market, the share-dilution effect does not arise.

The intuition for why the share-dilution effect doesn’t limit mergers when competition is for the market is as follows. Suppose that, in the event of merger, the merged entity adopts the entrant’s technology. If entry occurs, then after one period, the continuation game looks the same whether or not the entrant and incumbent have merged— either way there will be a single firm, which relies on the entrant’s technology. From the perspective of the current incumbent and most recent entrant, the only effect of their merger is to avoid a period of competition to be the dominant firm. If the merged firm would adopt the incumbent’s technology, then merger must be even more profitable.

To see this point formally, suppose that mergers are allowed and that the current entrant comes into the market in period l with a quality advantage sufficient for it to win the market if the firms do not merge. Absent merger, the incumbent earns

πI l (qf, ql) (1)

for one period and then exits the market, while (gross of the entry cost) the entrant earns

[Equation omitted]

where ρE l (·) ≡ 0 and VI l+j (ql, ql+j) denotes the continuation value that a firm with quality ql earns as the new incumbent when the next entrant comes into the market in period l + j with quality ql+j. πE l (qf, ql) in expression (2) equals the profits the entrant earns in the entry period. The terms involving π M l+j (ql) are the discounted profits the current entrant earns in later periods before subsequent entry occurs.

If the current incumbent and entrant merge and adopt the entrant’s technology, then they collectively earn

[Equation omitted]

Denote the gains from merger by Gl(qf, ql). Comparing the sum of expressions (1) and (2) with expression (3), the only difference is in the first period following entry, when merger allows the firms to avoid competing. Thus, if the merged firm adopts the entrant’s technology

[Equation omitted]

If the merged firm would find it more profitable to retain the incumbent’s technology, then Gl(qf, ql) would be larger than the right-hand side of eq. (4). A similar argument applies to cases in which the incumbent would prevail absent merger. Hence,

Proposition 1. When competition is for the market, it is profitable to merge regardless of the rate at which subsequent entrants arrive or firms discount future profits.

The finding that merger is profitable when competition is for the market is somewhat more general than Proposition 1. The key factors are that: (a) until entry next occurs, the incumbent and current entrant earn greater profits if they are merged than if they are independent competitors, and (b) their joint continuation value when entry next occurs is not lowered by their merger.23 The example presented in Section 7 below demonstrates that, as long as the incumbent would place no competitive pressure on the subsequent—as opposed to current—entrant, condition (b) is satisfied even if a non-merging incumbent would remain active in the market until the next entry event occurs.

5. Merger policy and product development

Now, consider the effects of merger policy on a potential entrant’s investment incentives. When entry is profitable if and only if it leads to merger, the ability to merge must increase the entrant’s investment incentives.24 Similarly, when entry is profitable if and only if mergers are prohibited, permissive merger policy must decrease the entrant’s investment incentives.

To further examine the effects of merger policy on marginal investment incentives, consider a firm that finds entry profitable regardless of whether or not it subsequently merges. Recall that entry is assumed to be profitable absent merger only if the entrant anticipates winning the market. Hence, when mergers are prohibited and entry occurs

[Equation omitted]

Using Eq. (5), any firm other than the first one to enter the industry earns

[Equation omitted]

Next, suppose mergers are allowed and that the incumbent always gets share σ of the gains from merging with the entrant. Then

[Equation omitted]

In general, the functions ρE t (·) and qE t (·) can vary across the two merger-policy regimes, which makes comparison of the entrant’s profits in the two regimes difficult. Assume that, for any given value of ql, terms of the form ρE l+j (ql) and πI l+j (ql, qE l+j (ql)) are identical under the two regimes.25 Under this assumption, the difference in the entrant’s objective function due to a merger—Eq. (8) minus Eq. (6)— is:

[Equation omitted]

l(ql) equals the expected net present value of the sum of the entrant’s share of the gains from merger with the incumbent, (1 − σ )Gl(qf, ql), and its share of what would have been the gains from merger with a subsequent entrant had it not merged with the original incumbent, σ Gl+j(ql, qE l+j (ql)). The latter term arises because it is a component of the entrant’s disagreement payoff with respect to the initial merger with the incumbent.

The effect of merger on the entrant’s investment incentives depends on the derivative of l(ql), which in turn depends in part on how Gl(qf, ql) and Gl+j(ql, ql+j) vary with ql. In general, the gains from merger are non-monotonic in the quality levels. For example, there are no gains from merger if: (a) the entrant’s product quality is so low that the entrant places no competitive pressure on the incumbent, or (b) the entrant’s product quality is so high that the incumbent places no competitive pressure on the entrant and the merged firm would not choose to adopt the incumbent’s technology.26 But there are gains from merger when the two firms have quality levels sufficiently close to one another that each firm would put competitive pressure on the other. This fact strongly suggests that the effects of merger on marginal innovation incentives are ambiguous. The derivative of l(ql) also depends on how the entrant’s choice of quality affects decisions by later potential entrants with respect to entry probabilities and investments in quality (i.e., terms of the form ρE l+j (ql) and qE l+j (ql)). Models that consider a single merger in isolation and only an all-or-nothing innovation project miss these effects.

Given these complexities, it is useful to look at explicit examples of product-market competition in order to identify possibilities and say more about welfare effects.

6. An example with network effects

The first example is of a market subject to network effects in which competing networks are incompatible. In keeping with the assumption that there are no production efficiencies from merger, assume that, even if an incumbent and an entrant merge, the incumbent’s existing users cannot be migrated to the entrant’s network and the incumbent’s existing network cannot be upgraded to the entrant’s quality. A merged firm must choose between adopting the entrant’s technology and stranding existing users, or retaining the incumbent’s network and not using the entrant’s technology.

Each consumer lives for two periods, and any given consumer purchases at most one subscription to a network. Each period, a unit mass of consumers enters the market, and each consumer chooses whether to subscribe to a network for two periods. I assume that a consumer cannot choose to wait one period before making a purchase. Hence, at any given time, half of the consumers in the market are choosing a network.

A consumer enjoys per-period gross consumption benefits of qβ(m) − p, where q is the chosen network’s quality, m is the network’s size or “member” base, and β(m) is the network benefit function, which is increasing with β(0) = 0.

When choosing a network, a consumer must forecast the sales of any currently available network in each period of his or her life. Consumers are forward looking and account for the possibility of entry in the second period of their lives. I assume that, if there are two firms actively selling output, consumer expectations “track quality” in that consumers expect the higher-quality network to win all of the sales in any given period (if qualities are equal, consumers expect the incumbent to win). This expectations process is very favorable to innovative entry because any degree of product superiority neutralizes the incumbent’s installed base advantage.27

6.1. Product-market equilibrium

Consider the product-market equilibrium when an entrant with quality ql competes against an incumbent with quality qf, where ql > qf. 28 In the entry period, the incumbent has an installed base equal to 1—the previous cohort of consumers who are in the second year of their lives. However, because consumer expectations track quality, consumers currently making purchases do not expect the incumbent to make any future sales.29 The incumbent thus offers a new consumer expected gross consumption benefits equal to qfβ(1).

The entrant has no installed base but has a projected base equal to 1 in the entry period due to its superior quality and the consumer expectations process. Consumers also form projections of the entrant’s user base in the next period. To simplify the analysis, assume that each subsequent generation of technological opportunity is a sufficient improvement over earlier ones that entry always occurs when an opportunity arises: ρE j (ql) = ρ¯ for all j ≥ l. 30

Suppose mergers are prohibited. If there is no entry next period, then the current entrant will have a user base equal to 2. If there is entry next period, then the current entrant is expected to have a future user base equal to 1 because the next entrant will have a superior product. Hence, the current entrant offers a new consumer expected gross consumption benefits equal to ql{β(1) + δβˆ}, where βˆ ≡ ρβ¯ (1) + (1 − ρ¯)β(2).

Consumers are assumed to recognize that, when mergers are allowed, users will not be stranded if entry occurs next period but the entrant merges with the incumbent and the merged firm uses the incumbent’s technology. Let γ t(q) denote the probability that, conditional on entry in period t and the incumbent’s having quality q, the resulting merged firm will use the incumbent’s technology. When mergers are permitted, a firm with quality q offers a new consumer expected gross consumption benefits equal to

[Equation omitted]

Note that βˆ t(q) ≥ βˆ, with strict inequality whenever γ t(q) > 0. In equilibrium, consumer expectations are fulfilled.

Now consider consumers’ purchase decisions. If mergers are allowed but the current entrant and incumbent do not merge, then consumers in the entry-period cohort choose the entrant’s product if and only if

[Equation omitted]

where pj is the price charged by a network that offers the generation-j product.31 \*\*\*FOOTNOTE BEGINS\*\*\* Firms either merge immediately or never merge; there would be no gains from delay. Whenever entry next occurred, at least one of the current entrant and incumbent would have an installed base of 0 and thus be competitively irrelevant to the next entrant. Hence, the firm without a base would have no effect on subsequent merger bargaining. \*\*\*FOOTNOTE ENDS\*\*\* The incumbent would be willing to charge a price below 0 only if it could later charge a positive price. However, if a negative price is needed to win in this period (when the incumbent has an installed base of users), then a negative price would also be needed to win in every subsequent period, when the incumbent would face either the current entrant or a subsequent entrant having an even-higher-quality product. Hence, the incumbent will price as low as 0, but no lower, to win sales. By inequality (10), the entrant can profitably win sales even if pf = 0. Therefore, in equilibrium, the entrant wins all of the sales in the period in which it enters, with

[Equation omitted]

Because the two cohorts of users are split across the two networks, the resulting gross consumption benefits are equal to {ql + qf}β(1).

Next consider the periods that follow period l but are prior to the period in which entry next occurs. The previous incumbent (generation f) has an installed base of 0 and consumers do not expect the firm to make future sales. Given β(0) = 0 and its unwillingness to price below zero, the previous incumbent offers consumers no surplus and, thus, places no constraint on the entrant’s pricing beyond that already imposed by consumers’ option to purchase nothing. When selling in period t, the most recent entrant has expected network benefits in the next period equal to βˆ t+1(ql). Consumer cohorts making purchase decisions in these periods thus choose the recent entrant’s product if and only if ql{β(2) + δβˆ t+1(ql)} − pl ≥ 0, and the entrant makes sales at pl = ql{β(2) + δβˆ t+1(ql)}. Because all users are on the generation-l network, gross consumption benefits are equal to 2qlβ(2) per period.

If mergers are banned, a similar analysis applies but with terms of the form βˆ t(ql) replaced by βˆ. In summary,

Proposition 2.

(i) Suppose that mergers are permitted, but the current entrant and incumbent do not merge. Then the continuation equilibrium has the following form:

a) in the entry period, the entrant wins all of the sales at a price of (ql − qf)β(1) + δqlβˆ l+1(ql) and gross consumption benefits are equal to {ql + qf}β(1); and

b) in subsequent periods prior to the next entry event, the generation-l entrant wins all of the sales at a price equal to ql{β(2) + δβˆ t+1(ql)} and gross consumption benefits are equal to 2qlβ(2) per period.

(ii) If mergers are prohibited, then the same results hold with βˆ replacing βˆ l+1(ql).

Now suppose that mergers are permitted and the current entrant and incumbent merge. Recall that the incumbent’s existing users cannot enjoy the benefits of the entrant’s higher-quality technology. The merged firm must choose whether to: (1) maintain two separate networks for one period and shut down the network based on the older technology at the end of the transition period,32 or (2) have new cohorts of consumers join the incumbent’s network even though the entrant’s network could offer higher quality.

If the entrant and incumbent merge, then there is no competition until the next entry event occurs. Thus, until then, the merged firm sets its prices to fully appropriate the expected consumption benefits. Straightforward calculations establish:

Proposition 3. Suppose mergers are permitted and the current entrant and incumbent merge.

(i) If the merged firm operates both networks during the entry (or transition) period and shuts down the network utilizing the older technology at the end of that period, then in the continuation equilibrium:

a) in the entry period, the merged firm makes sales on the new network at a price of ql{β(1) + δβˆ l+1(ql)} and gross consumption benefits are {ql + qf}β(1); and

b) in the subsequent periods prior to the next entry event, the merged firm makes sales on the new network at a price of ql{β(2) + δβˆ t+1(ql)} and gross consumption benefits are 2qlβ(2) per period.

(ii) If the merged firm operates a single network using the older technology, then in the continuation equilibrium the merged firm makes sales at a price of qf{β(2) + δβˆ t+1(qf)} and gross consumption benefits are 2qfβ(2) in the entry period and all subsequent periods prior to the next entry event

Propositions 2 and 3 demonstrates that, in this example, for ql > qf,

[Equations omitted]

which satisfy the reduced-form profit assumptions in Section 3 above.

The conditions of this example are favorable to entry. When mergers are prohibited, every firm chooses to enter given the opportunity and is an active producer for two periods. Hence, much of the time the industry is subject to product-market competition if ρ¯ is near 1. Proposition 1 implies that, by contrast, if mergers are freely allowed, then entry is immediately followed by merger, and there are no periods of product-market competition—the favorable entry conditions alone cannot protect product-market competition.

6.2. Inefficient entry and killer acquisitions

The favorable entry conditions can, however, promote the introduction of innovative new technologies. Given the assumed nature of consumer expectations, even a minor innovation can allow the entrant to appropriate a large fraction of the monopoly profits. As a result, there can be socially excessive entry.33

One situation in which this arises is when entry occurs and the merged firm uses the older technology: The only effect of entry on total surplus is to reduce it by the amount the entrant invests to develop its product. In some respects, the outcome in which the merged firm operates a single network using the older technology is similar to what is known in the pharmaceutical industry as a “killer acquisition,” where an incumbent buys a new drug but never introduces it to the market (Cunningham et al. (2019)). By contrast to pharmaceutical markets, however, there can be consumer and efficiency benefits of sticking with the older technology in order avoid the loss of network benefits that occurs when users are split across networks

In fact, a firm may fail to stick with the older technology when doing so would be efficient.34 Consider the technology-adoption decision of a firm newly created through merger. The private cost to the merged firm from splitting the current cohorts is equal to the loss in the consumption benefits it is able to appropriate: qf{β(2) − β(1)}. By contrast, the social cost from splitting the cohorts is 2qf{β(2) − β(1)}. The difference arises because the firm does not internalize the losses suffered by consumers who are in the second half of their lives during the transition period.

One also needs to account for the effects of the quality choice on profits in future periods. Adoption of the new technology generates gross consumption benefits prior to the next entry event, which the merged firm fully appropriates in expected value: the firm charges ql{β(2) + δβˆ t(ql)} instead of qf{β(2) + δβˆ t(qf)}. This effect induces no bias.

Adoption of the new technology also improves the merged firm’s bargaining position with respect to the next entrant: that entrant’s non-merger profits are decreasing in the merged firm’s quality. This bargaining effect is a purely private benefit.

The net effect of the first three components is to bias the firms toward adopting the new technology. However, there may be an effect running in the opposite direction: by adopting the new technology, the current firm may generate surplus for the next entrant because, when the current firm merges with that entrant, the new merged firm will have a more attractive option when deciding whether to use the current firm’s network. When δ is sufficiently small, failure to internalize the consumer losses due to stranding dominates, and the current incumbent and entrant are biased toward adopting the new technology. It is an open question whether, in other situations, merging firms can be biased toward the old technology.

In some situations, permissive merger policy can prevent inefficient stranding. As shown in Proposition 2(ii), when mergers are prohibited, the market will move to the new network and associated technology whenever the entrant’s product quality is at all higher than the incumbent’s. However, when mergers are allowed, it can be seen from Proposition 3 that the merged firm will stick with the old technology whenever the quality levels are sufficiently close together. Hence, there is a range of quality differentials such that total surplus is maximized when consumers remain on the old network and this happens if and only if the firms merge. In summary,

Corollary: By facilitating killer acquisitions, permissive merger policy can prevent socially inefficient stranding.

Although the corollary identifies a logical possibility, it is not clear how important it is in practice; the entrant’s innovation must be a large enough improvement that the entrant provides a credible competitive threat to the incumbent but not so large that the merged firm will adopt it.35 It should also be noted that even a merger that prevents inefficient stranding harms consumers through the loss of competition in the transition period.

6.3. Merger policy and entrant innovation

In addition to showing that killer acquisitions can sometimes be efficient, the network effects example illustrates that the option to merge can raise or lower the entrant’s marginal investment incentives. First, suppose that the merged firm adopts the entrant’s technology. Then, by Propositions 2 and 3,

[Equation omitted]

Similarly, if the next merger leads to adoption of the then-new technology,

[Equation omitted]

Recall that, in this example, ρE l+j (ql) = ρ¯ for all j > 0. Hence, by Eq. (9), when merged firms always adopt the newer technology,36

[Equations omitted]

Anticipation of the initial merger has no effect on the entrant’s marginal investment incentives; the gains from that merger arise because consumers do not get the surplus that the incumbent would have offered them as an independent competitor, and this amount does not depend on the entrant’s quality. However, for the same reason, an increase in the current entrant’s product quality does raise the gains from the merger with the next entrant if the current entrant does not merge with the incumbent. The current entrant’s anticipation of sharing the increased gains from a future merger raises its product-development incentives. The same argument applies to the first firm to enter the industry because it anticipates merging with a later entrant.

Now, suppose that the current merged firm retains the incumbent’s technology but again assume that, when the next entry event occurs, the resulting merged firm will adopt the technology of that entrant. Given the latter assumption, Gl+j(ql, ql+j) = β(1)ql and βˆ t(ql) = βˆ for all t from the entry period until the next entry event. As in the case just considered, an increase in the entrant’s product quality raises the gains from the merger that would take place between the current entrant and the next entrant if the former did not merge, which raises the entrant’s disagreement profits. Now, however, the gains to the initial merger, Gl(qf, ql), are decreasing in ql. Intuitively, the higher is the entrant’s product quality, the greater the opportunity cost of not using it. Formally, the effects can be broken into three components using Propositions 2 and 3. First, the gains from the initial merger realized during the transition period,

[Equation omitted]

are decreasing in the entrant’s quality. So too are the merger’s effects on the profits earned in each subsequent period prior to the next entry event,

[Equation omitted]

Third, because the merged firm adopts the incumbent’s technology, the gains to the current merger arising from effects on the gains to agreement associated with a subsequent merger, gS l+j (qf, ql) ≡ β(1)(qf − ql) are decreasing in ql.

Using the fact that ρE l+j (ql) = ρ¯ for all j > 0,

[Equation omitted]

Differentiating and collecting terms,

[Equation omitted]

The right-hand side of Eq. (11) is negative for any σ ≤ 0.5 or when σ < 1 and δ is sufficiently close to 0.37 Summarizing this discussion:

Proposition 4. When product-market competition exhibits network effects, permitting mergers: (a) can increase an entrant’s product-development incentives when the merged firm adopts the entrant’s technology; and (b) can reduce an entrant’s product-development incentives when the merged firm retains the incumbent’s technology.

7. An example with per-period fixed costs

Next, consider a market in which there are no network effects but, at the start of each period, a firm must incur a fixed cost of F in order to be an active producer in that period. An incumbent’s investment decision for each period is made before that period’s entry opportunity arises. A new entrant sinks its initial per-period investment at the same time that it makes its one-time entry investment, I. For simplicity, assume there are constant marginal costs of production, which are subsumed in the demand function.

Suppose there is no horizontal product differentiation and all consumers identically value vertical quality improvements, so that all consumers choose the same product in any period. Let X = qi − pi denote the per-period market demand function, where i is the index of the active producer offering the lowest quality-adjusted price, pi − qi. Any firm not charging the lowest quality-adjusted price makes no sales.

Consider a single incumbent with quality qf facing an entrant with quality ql. 38 If ql ≥ 2qf, the entrant’s innovation is drastic (i.e., because the monopoly price is ql/2, the current incumbent provides no competitive constraint even if it sets its nominal price at 0). In this case, the firms have is no incentive to merge, and the incumbent will make no further investments. Until the next entry event occurs, the current entrant earns profits of

[Equation omitted]

per period. If ql ∈ (qf, 2qf), the entrant’s innovation is non-drastic. If the firms do not merge and the next entry event has not yet occurred, then the current entrant earns

[Equation omitted]

in each period that the incumbent remains active and π M(ql) per period if the incumbent has dropped out.

Whether or not it remains active, the incumbent makes no sales in any period following entry. Assume that πC(qf, ql) > 0, so that the current entrant would find it profitable to pay the per-period fixed cost even if it anticipated the incumbent’s doing so as well.

If there is no possibility of merger, then the incumbent never invests F after entry has occurred and, thus, is a competitive constraint at most during the transition period. But suppose that merger is allowed. If the firms merge, they jointly earn product-market profits π M(ql) in each period until the next entry event. The gains from merger depend on what the incumbent would do absent merger. In the network-effects example above there is nothing that an incumbent can do to remain competitively relevant after the entry period because consumers’ perceived value of its product falls. By contrast, in the present example, an incumbent chooses whether to remain a competitive constraint (i.e., whether to invest F), which raises the possibility that an incumbent might sink F solely to induce the current or later entrants to pay it more to merge. That is, an incumbent might engage in incumbency for buyout.

To avoid some of the complications associated with such strategies, assume that the next entry event after the current one will entail a drastic innovation relative to the current incumbent (and possibly to the current entrant as well). This assumption implies that the presence of the incumbent as an independent firm would have no effect on the subsequent entrant’s incentives, and as an independent firm the current incumbent would have no ability to extract rents from any later entrant. Hence, merging does not give rise to a share-dilution effect. It follows that the incumbent and current entrant will merge to avoid dissipating rents in one or more periods until the next entry event occurs.

There remains the issue of the acquisition price. The cooperative-game-theoretic approach to bargaining with respect to the merger is problematical because the disagreement payoffs are not obvious when F is sufficiently small relative to π M(ql) − πC (qf, ql). For example, if subsequent entry occurs whenever the opportunity arises, then, depending on what the incumbent would do off the equilibrium path absent merger, the gains from merger could range from π M(ql) − πC (qf, ql) (when the incumbent drops out after the initial entry period)39 to πM (ql)−πC (q f ,ql)+δF 1−δ+δρ¯ (when both the incumbent and entrant invest in remaining in the market as long as they have not merged and there has been no subsequent entry in any previous period). But regardless of the acquisition price, the firms have incentives to merge, and a merger reduces consumer and total surplus by eliminating transition-period competition.

The value of the acquisition price can, however, affect an entrant’s product-development incentives. Suppose that a firm has an opportunity to enter using the generationl technology and face an incumbent with product quality qf. Moreover, suppose that technological opportunities are such that ql(I) ∈ (qf, 2qf) for all I, and with probability one an entry opportunity will arise in period l + 1 with ql+1(I) > 4qf for all I (so that ql+1(Il+1) will be drastic relative to ql(Il)). Under these assumptions, the gains from a merger between the incumbent and the generation-l entrant equal the increase in profits from the elimination of competition in the entry period. After that, a new firm will enter and displace the merged firm with a drastic innovation, which eliminates any incentive for a further merger. Hence, l(ql) = (1 − σ ){π M(ql) − πC (qf, ql)}. Differentiation yields l (ql) = 1 2 (1 − σ ){ql − 2qf}, which is negative given that ql(I) < 2qf for all I. Intuitively, the entrant chooses a lower product quality when mergers are allowed because the possibility of merger leads the entrant to put weight on the effects of its innovation on monopoly profits (which are a component of the gains from merger), which are less sensitive to the entrant’s quality than are the profits the entrant earns when competing with the incumbent.

In summary:

Proposition 5. When there is undifferentiated Bertrand product-market competition, permitting mergers can reduce an entrant’s product-development incentives even when its technology is adopted by the merged firm.

8. Incumbency for buyout

As long as an incumbent’s actions (e.g., investment levels or exit decisions) conditional on not merging are independent of whether mergers are permitted, the option to merge weakly increases an entrant’s profits. Hence, in this case, allowing mergers encourages innovative entry, and there can be situations in which entry is profitable only if entry for buyout is feasible. But the finding that the option to merge can only increase an entrant’s profits does not apply if there is a possibility that the incumbent can engage in conduct to appropriate a larger share of the post-entry profits through merger. As the following example shows, by facilitating incumbency for buyout, permissive merger policy can discourage innovative entry.

The structure of this example is the same as the one in the previous section, with three differences.40 \*\*\*FOOTNOTE BEGINS\*\*\* Permissive merger policy can discourage innovative entry in the example in Section 7 if acquisition prices are based on the belief that the incumbent will sink F in future periods if the firms have not yet merged. Intuitively, in the periods after the entry period but before the next entry event, the current entrant has to share π M(ql) with the incumbent rather earning it all itself. I consider the modified example in the text to avoid the issue of multiple equlibria based on beliefs regarding moves off the equilibrium path. \*\*\*FOOTNOTE ENDS\*\*\* First, F = 0, so there is no issue of the incumbent’s dropping out in future periods. Second, whenever an entry opportunity arises, it is drastic: ql ≥ 2qf. Third, if entry occurs, an incumbent can make a one-time, sunk investment of Z that allows it partially to imitate or catch up to the entrant, with resulting quality level qZ f , where ql ∈ (qZ f , 2qZ f ). The incumbent can imitate only the next entrant to arrive. The choice of investing Z is made after entry but before any merger discussions. There are gains from merger if and only if the incumbent invests Z.

The incumbent has no incentive to invest Z if mergers are prohibited—once entry has occurred, the incumbent makes no sales whether or not it invests Z. But when mergers are allowed, the incumbent will find it profitable to invest whenever Z < σGl(qZ f , ql) because doing so induces the entrant to merge and share some of the post-entry profits. Investing Z lowers the current entrant’s profitability, but the probability of later entry is unaffected in this example because the current incumbent is irrelevant as a standalone firm and neither the entrant’s nor merged firm’s costs are affected.41 Conditional on entry’s occurring, the incumbent’s investment has no effect on either gross consumption benefits or consumer welfare. For any given stream of entry events, the net present value of industry profits is less when mergers are allowed than when they are banned; the difference is the net present value of the rent-seeking investments in Z. It follows that, when Z is positive but sufficiently small that incumbents make the investment in response to entry when mergers are allowed, there must be at least some entry events that are less profitable when mergers are allowed than when they are banned. Thus, there exist parameter values for which merger discourages at least some entry.42

Summarizing the discussion of this section,

Proposition 6. Depending on the specifics of the market, banning mergers may: (a) reduce innovation by preventing entry for buyout, or (b) promote innovation by preventing incumbency for buyout that would otherwise deter entry.

This example only scratches the surface of actions an incumbent could take to improve its bargaining position. Here, the investment takes place only after entry has occurred. An incumbent might also make pre-entry investments designed to appropriate rents should entry occur. Such investments might also affect the probability that entry occurs at all. An interesting line of future research would examine how the possibility of merger affects an incumbent’s pre-entry investments, which can serve both to deter entry and to extract rents should entry occur.

Although the example presented above is very specific, it is sufficient to establish the general point that arguments that permissive merger policy supports innovation are too simple: banning acquisitions can, at least in theory, increase or decrease innovative entry. Moreover, as discussed above, entry incentives can be socially excessive, so that, promoting additional innovation does not necessarily promote greater total surplus.

9. Implications for merger policy

It is often argued that, under Schumpeterian competition, a firm that appears to be dominant today based on its market share may actually face strong competitive pressures from the threat of being displaced by an innovative entrant with little or no current share.43 This argument does not imply that dominance is not a concern. Instead, the importance of innovative entry as a driver of market performance provides a rationale for paying increased attention to harm to emerging or potential competition when assessing acquisitions by incumbents in such markets: acquisition of a firm that does not yet have a substantial—or even any—share of the incumbent’s immediate product market may nonetheless substantially harm future competition. Moreover, in markets subject to Schumpeterian competition, enforcement authorities should be wary of claims that the threat of future entry will discipline the market by discouraging inefficient mergers. As shown above, due to the absence of the share-dilution effect, acquisitions are especially likely to be a profitable strategy for avoiding Schumpeterian competition.

It is also often argued that mergers facilitate innovation by allowing entry for buyout. The analysis above, however, demonstrates that the possibility of merger can have positive or negative effects on entrants’ innovation incentives. Hence, in some instances, blocking mergers will promote both dynamic and static efficiency, rather than sacrificing the former for the latter.

Several recent reports address competition policy toward large digital platforms. They generally call for heightened scrutiny of acquisitions by dominant firms in markets with strongly increasing returns to scale, innovation, and competition for the market, especially with regard to acquisitions of potential or nascent competitors.44 The analysis of the present paper broadly supports these proposals.45 \*\*\*FOOTNOTE BEGINS\*\*\* It also supports the conclusion that merging parties should not be exempted from notifying antitrust authorities based on having low current sales and/or market share. Furman et al. (2019, pp. 12 and 94-95) and Stigler Committee on Digital Platforms (2019, p.16) express concern with underreporting. The U.S. Federal Trade Commission has recently requested information on past un-notified acquisitions by major tech firms (U.S. Federal Trade Commission, “FTC to Examine Past Acquisitions by Large Tech Firms: Agency Issues 6(b) Orders to Alphabet Inc., Amazon.com, Inc., Apple, Inc., Facebook, Inc. Google, Inc., and Microsoft Corp.,” press release, February 11, 2020), and the European Commissioner for Competition has stated that the European Commission is developing means for screening smaller acquisitions by Big Tech (Arjun Kharpal, “EU says it will look closer at smaller acquisitions made by big tech firms after ‘shopping spree,’” CNBC, February 18, 2020, available at cnbc.com, accessed March 13, 2020). \*\*\*FOOTNOTE ENDS\*\*\*

#### That entrenches slow growth---only a dynamic technology sector can rebuke the trend.

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A growing role of science and state-of-the-art technology in ensuring sustainable economic growth has become obvious lately [1, 2]. The innovation type of development has placed a special emphasis on the use of the leading-edge technologies, the production of high-tech products, the implementation of progressive organizational and management decisions [3]. Technology has fundamentally and quickly changed the structure of the world economy and has become one of the primary factors in economic progress. The shifts have outlined the radically new global space, novel conditions for competition in world markets, and modern principles of interaction between enterprises.

The role of technology in today’s economy has long been debated among researchers [4, 5]. However, there is still a lack of studies on the reasons behind technological inequality between countries. Currently, one can observe a new bipolar configuration of the global technological space forming, where the USA and China are taking the lead and all other countries are unable to close this gap in the short term [6, 7]. The spread of technological innovations is uneven, which causes technological inequality to emerge that represents a new challenge to sustainable economic development. The availability of technology and capital exacerbates the problem of economic differentiation. At that, the modern form of uneven development can no longer be represented using the common schemes, since it is widely manifested in various fields. Such indicators as labor productivity, living standards, GDP per capita, etc. characterize the overall state of national economies, but do not specify the factors which contributed to obtaining this position. Structural analysis highlights that the technological factor is among the most significant ones determining the objective pattern of uneven development [8]. However, the question remains about the constituent parts of the technological factor (its component base), methods and approaches to assessing the influence of this factor on economic growth. Researchers have different approaches to the selection of a set of technological factor indicators. This poses a problem of methodological consistency that precludes comparative research. For this reason, the topic of this study is becoming relevant, related to the study of the influence of the technological factor on differences in economic growth and inequality between countries.

Thus, the relevant studies point to a distinctive primacy of manufacturability as the main factor in sustainable economic development. Then, we aim to clarify the role of the technological factor. However, even now one can argue that the aggravated cross-country competition implies the need for tools to assess and determine the key determinants of technological economic growth. The results are expected to confirm the significance of the technological factor, allow identifying its parameters and setting their priorities for improving economic policy aimed at sustainable development. These circumstances understood will open up opportunities for countries to narrow the technology gap.

2. Literature review on the technological factor of economic development

Economic theory pays special attention to issues of development and sustainable growth, as well as the causes of differences and factor changes. The sources of economic growth through GDP were specified in [9–13]. These researchers agree that sustainable economic growth is driven by factors such as new technologies and globalization. However, with the availability and access to these factors, it becomes important to build optimal management. The dynamics of economic growth is believed to be based on the results of structural transformations, mastering new technological principles, the introduction of innovations and an increase in labor productivity. At that, the seemingly insignificant differences in the economic growth rates bring about the substantial divergence in countries’ economic potential. Determining these discrepancies becomes a relevant scientific task.

It is becoming increasingly obvious that if the economy is not focused on technological innovation, it has no prospects for long-term development [14–17]. Some researchers, such as [14], focus on fundamentally new solutions (patents) that have commercial implementation potential. We can agree with this opinion, because it is innovation that should ensure accelerated economic growth at the expense of competitive advantages. A similar opinion is expressed by [15]. The publication [16] proves that renewed industrialization becomes an important condition for the development of technology. According to [17], entrepreneurial skills are needed to support industrialization.

Numerous studies [18–20] demonstrate that there is a direct correlation between the technological preparedness of a country and its ranking in the global economy. Research results on this issue are coordinated. These trends, if underestimated, lead to the fact that some countries can find themselves lagging behind. Here, it is important to realize the essence and the role of the technological factor, as well as the opportunities for managing the level of technological effectiveness of the economy. However, in [18, 19] there are no clear indications of quantitative measures of the technological factor.

We agree with [21], who claims that the technological factor is new technologies or their clusters that underlie the changes in the relative cost of production factors, stimulate the development of new industries and enhance the efficiency of traditional ones. Historical regularities in the emergence of fundamental technological innovations give impetus to structural changes in the economy [22]. Therefore, it is important to identify the determinants of economic growth that occurs against the background of technological structural changes. As practice shows, national economies, which for one reason or another were unable to independently create high-tech products, first applied imitation strategies within the country, and then entered foreign markets by occupying particular niches [23–25]. These researchers note the role of R&D spending and high-tech exports in economic growth. However, factor quantitative estimates are not given. The development of the USA and China are interesting cases here. For example, from a country that had mainly copied innovations, China turned into one of the leading innovation-generating nations leaving behind most other countries in terms of the level of technological development. In this context, the patterns of production, distribution, exchange and consumption of goods are largely predetermined by the peculiar nature of the technological processes [8]. At the same time, the observed temporal reduction of cycles is formed precisely due to the technical progress and the use of innovations [26].

The study of the reasons behind technological inequality is believed to lend some insight into the mechanisms that underlie economic changes. According to [27, 28], the choice of a model of economic growth should focus on mobilizing the potential to follow the technological path of evolution. Since the modern development of the theory of evolutionary economics is based, first of all, on the neo-Schumpeterian theory, which determines the need for structural technological changes in ensuring sustainable economic development, such changes provide for the formation of new industries with a high degree of processing of primary raw materials and an increase in the efficiency of traditional ones. Therefore, the issue of developing an integral strategic management system aimed at ensuring innovative structural changes becomes relevant. As we see it, these changes are of a technological nature.

Thus, the literature review demonstrates that economic growth is significantly affected by the flows of developed and exported technologies [29], as well as R&D costs [30–32]. The presence of stable patterns for these factors allows us to use them in the assessment model. The indicators proposed by the researchers (the share of ideas with the potential for commercialization [33], the share of R&D funding in GDP [34], indicators of science, technology and innovation development [35], the number of patents [36]) often reflect the multidirectional dynamics of the technological factor’ financial aspects and its qualitative components.

The review confirmed the significance of the technological factor for economic growth. At the same time, there is a clash of researchers’ opinions on key determinants. In the context of the literature review, the indicators of the technological factor need to be revised. The question about the approaches to assessing the impact of the technological factor on economic growth is left unanswered, which proves the relevance of the present research.

3. The aim and objectives of the study

The aim of this study is to develop an integrated approach to assessing the impact of a technological factor on economic growth. This will provide an opportunity for a comparative analysis on the countries for technology gaps.

To achieve the stated goal, we aim to fulfill the following objectives:

– to determine the leading countries and outsiders in terms of digitalization of the economy;

– to assess the dependence of economic growth on the technological factor.

4. Materials and methods

In the present study, technological effectiveness refers to the ability of a country to implement structural reorganization in accordance with the model of innovation development and realize its scientific and technological potential. We evaluate the level of technological effectiveness of the economy using the relevant index that serves as the basis for ranking countries. The set of technological factor indicators that will be used in our approach will be adjusted taking into account the literature review.

To calculate the Index (Ii), we use the indicators characterizing various aspects of technological development of the nations under review (Table 1), such as:

– industrial production index (ai );

– the share of the production of machinery and equipment in total value added (bi );

– the share in global value added by the economic activity ‘Production of computing, electronic and optical equipment’ (ci );

– the share in global value added by the economic activity ‘Production of machinery and equipment’ (di );

– ICT development index (ei );

– domestic R&D costs, % in GDP (fi ).

For empirical verification, we use official statistics. The frequency of data updating does not allow reflecting the most recent trends that affect economic processes (such as the impact of COVID-19). This is a research limitation. We also need to understand that some trends are short-term in nature, and their impact can be neglected.

[Chart omitted]

The method of Euclidean distances is used to rank the indicators’ values; normalization (Ixi ) is calculated by formula (1). The boundaries of normalized indicators are set in the range from 0 to 1.

[Equation omitted]

where Xi is the actual value of the indicator; Xmin is the minimum value of the indicator for the sample population; Xmax is the maximum value of the indicator for the sample population.

The level of technological effectiveness is calculated using the cumulative method as a weighted mean:

[Equation omitted]

The closer the Index value is to 1, the higher the level of technological effectiveness of economy.

To determine the econometric relationship between economic growth and indicators characterizing the technological factor, a linear multiple regression model was applied.

[Equation omitted]

where X1, X2, X3…, Xn denote factors; ɛ denotes error; β denotes a vector of the parameters under evaluation.

The gross domestic income of the United States and China for the period of 1996–2019 was taken as dependent variables (Table 2).

Table

Description automatically generated

The independent variables were represented by the volume of electronics production (Elc), costs incurred in installation and maintenance of equipment/technologies (CTech), the volume of high technology exports (HTExp), and investment in R&D activities (RD). Data are given in Table 3.

[Table omitted]

Based on the purpose of the study, we put forward two hypotheses about the nature of the patterns observed:

Н1. Growing R&D costs accelerate economic growth. Such an increase is expected to stimulate R&D in industries with comparative advantage. Consequently, this strengthens the country’s exports (foreign trade surplus).

Н2. Arrested technological development adversely affects competitiveness and, as a result, economic growth, since outdated equipment results in higher resource intensity and low labor productivity.

We test the hypotheses and the methodology for assessing the level of technological effectiveness using the sample of 30 countries. The aggregate of research objects embraces several developed countries, developing countries with high GDP, as well as developing countries not included in leading world economies. The selection is due to the need to cover a wide range of economies characterized by a wide variety of development conditions.

5. Results comparing technological effectiveness of economies

5. 1. Leading countries and outsiders in terms of technological innovation

The global economy in the context of Industry 4.0 demonstrates a number of specific features that distinguish it from the previous development stages. Firstly, technological innovation is becoming increasingly expensive, which causes a significant increase in R&D costs [38]. Secondly, the rate of technological change has increased dramatically. The terms of development and implementation of new solutions were reduced in the first place [8]. Technological gap can now be measured exponentially [39].

Look at a range of indicators characterizing the level of technological effectiveness of national economies. The share of domestic R&D costs in GDP is one of them (Fig. 1). The highest level of R&D funding in GDP is observed in the Republic of Korea, Sweden, Japan, Germany, the United States, China and other countries leading in the Global Competitiveness Report.

Analysis of the current changes in the global economy indicates that the importance of the comparative advantages of the lower order – cheap labor, basic production resources and the availability of raw materials – is decreasing [40]. At the same time, advantages of a higher order are gaining in significance, such as the ability of countries to develop high-tech industries, to manufacture and export products with a high intellectual component and in-depth processing [41]. For instance, the United States and China account for 90 % of the market capitalization value of the world’s 70 largest digital platforms, 75 % of all patents related to blockchain technologies, more than 75 % of the world market for public cloud computing, about 50 % of global spending on IoT, 40 % of world data centers, 36 % of the global value of e-commerce [42], and 69 % of supercomputers [43]. These areas are of significant potential and can have a serious impact on economic restructuring. Therefore, a special focus of the analysis is put on such indicator as the share of high-tech production (including computing, electronic and optical technology) (Fig. 2). China, Germany, Italy, the United States and Japan have the largest share in global value added in the production of computing, electronic and optical equipment. Norway, Canada, Australia, Sweden, Romania, Poland, etc. are relatively poorly represented in these world markets.

High-tech industries focusing on domestic production can be viewed as sources of economic growth. Data on the share of machinery and equipment production in GDP show similar trends (Fig. 3). High-tech industries strongly stimulate the economic growth of the leading countries – the Republic of Korea, China, the United States, Germany, and Japan, – while countries with low competitiveness demonstrate poor results.

[Table omitted]

Analysis of the countries indicates that some of them did not demonstrate high values of the indicators reviewed, but the level of their technological effectiveness is much higher (the group of “backward” countries embraced Denmark, the Netherlands, Sweden, Norway, and Canada). To gain a comprehensive picture and rank the countries, we have calculated the integral index of the technological effectiveness that covers financial aspects of development, as well as qualitative characteristics of economic growth. The Index calculation methodology is presented in section 4 of the paper. The countries’ ranking is presented in Table 4.

[Table omitted]

5. 2. Assessment of the dependence of economic growth on the technological factor

As articulated earlier, an increase in GDP can result from various factors. To substantiate the relationship between economic growth and the technological factor, we construct a number of models. The parameters of the regression models for the USA and China are given in Tables 5, 6. The parameters of the multiple regression model were obtained using STATISTICA software.

[Table omitted]

We have obtained a model with good quality characteristics; in this case, the coefficient of determination R2=0.996, normalized R-squared=0.995, multiple R=0.998.

[Table omitted]

The model obtained for China is also characterized by good quality characteristics: the coefficient of determination R2=0.999, normalized R-squared=0.999, and multiple R=0.999. Checking of the model adequacy according to the F-test produced the following results: the calculated value F=10.09 at the level of significance p=0.01.

Having analyzed the models’ data, we can conclude that there are no factors with a high probability of insignificance (t-Statistic for each model are greater than the critical value at a significance level of p=0.01), i.e. all regressions are significant.

To evaluate the degree of adequacy of the constructed trend equation to the real process, the mean approximation error was computed. Its value (3.167 % for China and 1.54 % for the United States) indicates that the degree of the quadratic equation’s adequacy to the real conditions of the relationship between economic growth and the technological factor is high.

Fig. 4 provides a visual distribution of actual and calculated values of the regression models.

Analysis of the models for the United States and China allows us to deduce that R&D costs are significant regressants contributing to economic growth; the factor impact on GDP growth in the United States and China is 31.6% and 41.9%, respectively; export of high-tech products provides an increase in GDP by 2.7% and 4.7%, respectively. It is worth noting that the obtained negative coefficients in the regression models suggest a weak correlation between the effective feature (economic growth through GDP) and some factor variables. For China, the indicator “Costs incurred in installation and maintenance of equipment/technologies” reveals an inverse relationship with GDP. A similar trend is observed in the United States for the indicator “Production of electronics”. Our calculations confirm that the strongest relationship is observed between GDP and development costs, as well as the share of high-tech industries in global value added.

[Chart omitted]

The current research proves that countries with substantial R&D funding and a large share of high-tech products in GDP and total exports are characterized by sustainable economic growth. Thus, the H1 hypothesis was confirmed.

The H2 hypothesis was partially confirmed: countries capable of using their innovative potential effectively are characterized by an elevated level of competitiveness. However, the use of outdated technologies does not always results in a decrease in global competitiveness, since these processes can be influenced by the institutional environment, which was beyond the scope of the present study

6. Discussion of the results comparing technological effectiveness of economies

Testing the approach using the case studies of China and the United States makes it possible to extrapolate their experience to countries with a low level of technological effectiveness. For example, the China and USA lead the global market for technological innovation. The country’s competitiveness in this field is due to the highly dynamic nature of American business, strong institutional underpinnings, finance mechanisms and a powerful innovation ecosystem [1]. Index of the countries’ technological effectiveness (Table 4) confirms this trend. The calculated values of the Index indicate the leading positions of these countries. The rapid growth of the renewable energy sector is a testament to why China will continue to dominate the sectors in which it invests heavily [44]. Currently, the PRC accounts for 90 % of the world’s supply of mobile phones and personal computers. In 2018, the country’s share in global semiconductor consumption was 41 %; by 2024, it is forecasted to increase to 54 % [45]. Significant funds received from low- and medium-tech industries in China are directed to those economic sectors, which enjoy research, development and implementation of hightech solutions.

It is noteworthy that in terms of the level of technological development, Kazakhstan, Brazil and Ukraine lag significantly behind some European nations (Romania, Poland, and Bulgaria), Turkey and Mexico. These countries do not exhibit sufficient potential to introduce innovations independently, but with regard to successful transfer and adaptation of foreign high technologies, they are significantly ahead of other countries with a similar development level. India is among the countries with high technological growth potential. India is now at a stage where machine learning tools are rapidly replacing entry-level programmers in the IT sector. So far, India is ranked 15th, but the situation may change soon. The comparison showed the advantage of the proposed methodological approach. We have been able to analyze the technicality of countries using universal data sets. The Index of the countries’ technological effectiveness can be a good alternative to other methods of assessment.

During the research, we have confirmed the hypotheses put forward. Assessment of the dependence of economic growth on the technological factor showed a strong relationship between GDP and R&D costs (Tables 5, 6). These results prove that sustainable economic growth is explained in most cases by significant funding for R&D (the presence of a large share of high-tech products in the country’s GDP) and the export of high-tech products.

Therefore, technologies determine competitive advantages of states at large. However, qualitative factors of economic growth prevail in a continuous innovation process. What determines additional limitations of our methodological approach. Special focus should be placed on a specific feature of the periods when changes occur, i.e. the periods of the so-called “technological gap” [46]. This is when the foundations of the future economy are set. Technological incentives crucial for growth are based on the ability to deliver better results. If technological inequality is excessively gross, it can jeopardize economic growth. Creating favorable conditions for the use of high technologies will not only support the competitiveness of production and attract investment in the economy, but also help resolve such issues as enhancing the efficiency of resource exploitation.

Hence, scientific and technological progress is the central stimulus for economic development, which in production processes is implemented through investment and innovation. At that, the dynamics of economic growth in the long run is dependent on a wide array of factors forming supply and demand for technological change: the current techno-logical capability of the national economy [19]; the development stage of financial institutions; companies’ awareness of R&D, and the effectiveness of technology transfer within the innovation infrastructure [47]; the nature of the state scientific and technical, scientific and technological, structural, and stabilization policy, and the level of state guarantees for the protection of intellectual property rights [25]; conditions of foreign economic activity, and competitiveness of products and services in the global market [48]. The characteristics of the listed factors vary significantly across countries, but the multicausality of the factors indicates that their combinations at certain time intervals can both reduce and boost the level of technological effectiveness.

#### BUT solely by ensuring lagging incumbents AND potential entrants can compete will lock-in any productivity gains.

James Manyika & Michael Spence 21, Chair and Director of the McKinsey Global Institute; Philip H. Knight Professor and Dean Emeritus at Stanford University's Graduate School of Business, "A Better Boom: How to Capture the Pandemic’s Productivity Potential," Foreign Affairs, Vol. 100, No. 4, August 2021, HeinOnline. language edited.

The pandemic did more than temporarily [freeze] ~~paralyze~~ the global economy, however. It spurred businesses in practically every sector to radically rethink their operations, often accelerating plans for technological and organizational innovation that were already in the works. Overwhelmingly, firms adopted new digital technologies that enabled them to continue doing business even under severe coronavirus restrictions. The result was a profound economic transformation, one that has hastened the potential for productivity gains even in sectors that have historically been slow to change. In health care, for example, telemedicine had long promised new efficiencies and added value, but it was not until the COVID-19 crisis that it took off. In retail, with the exception of e-commerce players, firms had been slow to adopt digital sales strategies, doing so mostly as a way to complement Main Street retailing. That changed rapidly with the pandemic.

Surprising as it may seem, out of the deepest economic crisis since World War II could come a new era of productivity gains and prosperity. Whether that happens will depend largely on the decisions that governments and businesses make as they prepare to exit the pandemic in the coming months. In the short and medium term, the prospects for increased productivity—and prosperity—are encouraging, as the United States and other countries spend heavily on economic recovery and businesses reap the benefits of digitization. But the outlook is less optimistic over the long term, since governments cannot spend indefinitely and consumer and investment spending may not fill the gap.

Governments and businesses must therefore seek to create the conditions for sustained productivity growth and prosperity, in particular by facilitating the diffusion of technological and organizational innovations and bolstering consumer demand. Out of a major global crisis could come a major jolt of productivity growth—but only if policymakers and business leaders make the most of this moment.

THE PRODUCTIVITY PARADOX

The history of productivity growth can be understood as a succession of technological revolutions, from the steam engine to the computer. Each offered the promise of accelerated productivity and economic growth, and each eventually delivered. But there has often been a delay between innovation and adoption, and another between adoption and economic impact. The economist Robert Solow summed up these apparent discrepancies in a 1987 article in The New York Times Book Review, writing, “You can see the computer age everywhere but in the productivity statistics.” His formulation became known as “the Solow paradox.”

But then came the revolution in information and communication technologies between 1995 and 2005, a decade in which the Solow paradox was temporarily resolved. Widespread adoption of these technologies was accompanied by a simultaneous acceleration in productivity, which grew at an annualized rate of 2.5 percent in the United States, a full percentage point faster than the rate between 1970 and 1995. Companies invested heavily in information and communication technologies and reorganized their operations and managerial practices around them. They did so out of the desire to gain a competitive edge, but also because of relatively robust consumer demand for their products.

Productivity growth accelerated in several sectors as a result, driving growth in the U.S. economy as a whole. This period was characterized by an unusual combination of large spurts in productivity growth in a few big sectors employing many workers, such as retail and wholesale, and even larger productivity growth in smaller sectors, such as those that produced computers and electronic products. In both big and small sectors, there was a virtuous cycle of employment growth to meet demand and even faster growth in the value of the output from these sectors. The value of outputs across all sectors of the economy grew by 3.4 percent per year between 1995 and 2005, whereas the total number of hours worked grew by only 0.9 percent per year.

But the boom did not last. Between 2005 and 2019, annual productivity growth in the United States fell by more than half, to 1.0 percent. In the aftermath of the 2008 global financial crisis, from 2010 to 2019, it was even lower, at 0.6 percent. Unlike the United States, European countries had not experienced rapid productivity gains in the 1995–2005 period, but they did experience the postcrisis decline. Between 2010 and 2019, annual productivity growth fell below one percent in France, Germany, and the United Kingdom.

The Solow paradox was back. After a decade of rapid productivity gains, the information technology revolution had reached a point of diminishing returns. But the next wave of technology—the digitization of processes, big data and analytics, cloud computing, the Internet of Things—was not yet ready to fill the gap. Despite early breakthroughs in image recognition and natural language processing, few firms had begun to make use of artificial intelligence technologies, and digitization was proceeding slowly. We estimated, based on a sector-by-sector assessment, that in 2015, the United States had reached only 18 percent of its digital potential and Europe had reached only 12 percent. Moreover, a gap had opened up between the firms that were digital leaders and those that were digital laggards—a gap that other researchers found was correlated with a gap in labor productivity.

This gap in technology adoption was widening at a time of weak consumer demand for goods and services, in large part due to the aftereffects of the financial crisis. Firms scaled back their investments, and fewer new businesses were created. Making matters worse, the share of income that flowed to top earners and the owners of capital increased, while the share that went to labor decreased, further weakening demand.

Across the United States and Europe, the vast majority of sectors experienced declines in productivity growth. Only four percent of all sectors recorded productivity jumps in 2014, compared with an average of 18 percent of sectors that achieved substantial increases in productivity in the previous two decades. Growth in gross value added—a measure of a firm’s or a sector’s contribution to GDP—declined from 3.4 percent annually between 1995 and 2005 to 1.8 percent between 2005 and 2019. Growth in hours worked remained roughly unchanged, at 0.7 percent, throughout both periods.

These two very different periods of economic activity in the United States reveal much about the underpinnings of productivity growth. It stems first and foremost from the widespread adoption of technological innovations, especially general-purpose technologies such as electricity and the Internet. But it also stems from the managerial innovation and reorganization of functions and tasks that occur when firms adopt new technologies. Both of these processes must spur leaps in productivity growth in many sectors, or at least in a few large ones, so that productivity jumps in the economy as a whole. Finally, adoption and reorganization within and across sectors must be driven by competition, which incentivizes firms to innovate and helps spur technological diffusion.

Not all productivity growth is created equal, however. Productivity growth can be achieved through gains in the volume or value of outputs for a given number of hours worked, or it can come about as a result of a reduction in hours worked for a given output. Often both happen at the same time. But it is when the former exceeds the latter that a virtuous cycle is created in which innovation and investment generate growth in employment and wages, which in turn generates demand for increased (or more valuable) output. This is what happened during the period from 1995 to 2005. When the latter source of productivity growth exceeds the former, however, a vicious cycle results in which firms reduce labor costs faster than they grow the volume or value of their outputs, which in turn puts pressure on employment and incomes.

POST-PANDEMIC POTENTIAL

The pandemic has primed advanced economies for another period of rapid productivity growth. It is too early to say for sure whether such growth will be the product of a virtuous or a vicious cycle, but signs point to the former. Despite uncertainty, stress, and plummeting economic activity in the early days of the COVID-19 crisis, many firms boldly deployed and used new general-purpose technology—especially digital technology—in ways that have driven virtuous productivity gains in the past. In October 2020, we surveyed 900 C-suite executives in various sectors and countries and found that many had digitized their business activities 20 to 25 times as fast as they had previously thought possible. Often, this meant shifting their businesses to online channels, since roughly 60 percent of the firms we surveyed experienced a significant increase in customer demand for online goods and services as a result of the pandemic.

Before the pandemic, e-commerce was forecast to account for less than a quarter of all U.S. retail sales by 2024. But during the first two months of the COVID-19 crisis, e-commerce’s share of retail sales more than doubled, from 16 percent to 33 percent. And that growth did not just reflect brick-and-mortar firms setting up shop online for the first time. Firms that were already highly digitized before the pandemic significantly expanded their online capabilities to meet the surge in demand. They also reorganized their operations, including their logistics, to complement what they were doing digitally—for example, by expanding their direct-to-home delivery capabilities.

Businesses also strove to become more efficient and agile. In Europe and North America, nearly half of the respondents to our survey said that they had reduced their operating expenditure as a share of revenue between December 2019 and December 2020. Two-thirds of senior executives said they had increased investment in automation and artificial intelligence, whether to help warehouse and logistics operations cope with higher e-commerce volumes or to enable manufacturing plants to meet surging demand. Many companies used technology to reduce the physical density of their workplaces or to enable contactless service—for instance, by expanding self-checkout in grocery stores and pharmacies and employing online ordering apps for restaurants and hotels. Other businesses, such as meatpacking and poultry plants, accelerated the deployment of robotics to reduce their need for labor. If there was one lesson from the pandemic, it was that digital capability and resilience go hand in hand.

But even as the arrival of vaccines has made it possible to imagine a return to relative normalcy in parts of the developed world, continued digitization and the adoption of other technological innovations promise to deliver still more productivity gains. The largest of these gains—roughly an additional two percentage points per year—could come in the health-care, construction, information technology, retail, pharmaceutical, and banking sectors. In health care, for instance, accelerating the use of telemedicine beyond the pandemic could drive incremental productivity growth for years. According to one recent U.S. poll, 76 percent of patients expressed interest in using telemedicine in the future, and industry experts project that the services for 20 percent of health-care spending could be delivered virtually—up from 11 percent before the pandemic. Other sectors, including automotive, travel, and logistics, show less—but still substantial—potential for productivity growth as a result of more flexible task scheduling, leaner operations, and smarter procurement.

Overall, these innovations and organizational changes could accelerate productivity growth by around one percentage point per year between now and 2024 in the United States and the six large European economies that we analyzed (France, Germany, Italy, Spain, Sweden, and the United Kingdom). This gain would result in a productivity growth rate twice as high as the rate after the 2008 global financial crisis, and in the United States, it would expand per capita GDP by roughly $3,500 by 2024. That would be a stunning outcome, but it will hinge on continued technology adoption by firms and the maintenance of robust demand.

Even more productivity gains could be on the horizon thanks to other advancements. The accelerating revolution in biology, for instance, could transform sectors from health care and agriculture to consumer goods, energy, and materials. Biological innovation has already enabled the rapid development of new vaccines for COVID-19. Equally impressive revolutions in energy could make possible the widespread adoption of solar and wind power, especially in light of recent progress toward better (and cheaper) batteries. Artificial intelligence is also advancing rapidly, but is still a long way from being deployed widely across companies and sectors. When and if that happens, the productivity gains could be enormous.

FOLLOW THE DIGITAL LEADER

Future gains in productivity, even those that boost overall growth, are likely to be uneven. We analyzed metrics that have the potential to unleash future productivity growth—such as research-and-development spending, revenue, capital expenditures (including digital expenses), and mergers and acquisitions—and found that especially in the United States, a small number of large superstar firms accounted for a disproportionately large share of the activity in all these categories. From the third quarter of 2019 to the third quarter of 2020, U.S. superstars (defined as the top ten percent of firms by profit) saw much shallower declines in capital expenditures and revenue than did other companies. During the same period, U.S. superstars spent $2.6 billion more on R & D than they did the previous year, while all other firms spent just $1.4 billion more.

If this investment, innovation, and technology adoption gap between superstars and the rest of the large firms and smaller, less profitable firms persists, any post-pandemic acceleration in productivity growth could fall short of its potential. Small and medium-sized enterprises have been hit disproportionately hard by the COVID-19 crisis. As a result, many of them are unable to make big investments in future productivity and are therefore liable to fall even further behind the superstars. This is what happened in the aftermath of the 2008 global financial crisis, when only a minority of companies achieved productivity growth.

But there is room for cautious optimism about the ability of non-superstars to close some of the gap. Before the pandemic, the superstars tended to be highly digitized and innovative in their managerial approaches, as well as more profitable and resilient. They were therefore better placed to weather and even take advantage of the shock. But as the hardest-hit firms and sectors recover, and as early digital adaptors demonstrate the enormous potential of these technologies, many of the digital laggards could begin to catch up. Indeed, in another survey of executives we conducted in December 2020, about 75 percent of respondents in North America and Europe said they expected investment in new technologies to accelerate substantially between 2020 and 2024, up from 55 percent between 2014 and 2019. This expected uptick was similar across firm sizes.

Another reason for optimism is that in 2020, a year that saw the darkest economic days of the pandemic, 24 percent more new businesses were created in the United States than in 2019. Europe lagged behind the United States on this metric, with new business creation staying roughly flat in 2020 in France, Germany, and the United Kingdom and declining by more than 15 percent in Italy and Spain. If the American increase in business dynamism persists, however, it should contribute to more productivity growth.

Investment, innovation, and technology adoption are only one-half of the virtuous cycle of productivity growth, however. The other half is demand for the expanded output that results—in other words, income growth from increased productivity has to flow to people who will spend that additional money. In the short term, the outlook for demand is good, especially for countries that have made progress toward vaccinating their populations and could be among the first to open up their economies. Pent-up demand and savings from the pandemic could be unleashed all at once, resulting in a strong initial bounce in demand led by consumers. In the United States, President Joe Biden’s $1.9 trillion economic support bill should push demand even higher.

In the medium term, the outlook for demand is also relatively solid, although it will depend on the size, deployment, and longevity of government spending. In the United States, Biden now has set his sights on a large infrastructure package. As his administration shifts its focus from economic relief to investment in productive areas, it could also increase productivity growth by raising demand to match potential supply, creating a high-pressure economy, that is, one with low unemployment and high growth. The outlook in continental Europe, where large-scale government economic support is harder to coordinate, is less certain. Nonetheless, the EU has put in place an unprecedented plan totaling some $900 billion to boost investment in the digital and green energy transitions.

But government spending on this scale will likely be time-limited, making the long-term outlook for demand less rosy. Moreover, long-neglected problems, including the falling share of firms’ income going to workers, rising inequality, and the long-term decline in private investment, could drag down demand. Roughly 60 percent of the post-pandemic productivity gains that we estimate could come from innovations and organizational restructuring—the one percentage point of acceleration per year between now and 2024—would stem from firm-level measures, such as automation, designed to cut labor and other business costs. Unless firms do more to boost the volume or value of their output and help workers transition by acquiring new skills, the drive for efficiency will risk generating productivity gains through a vicious, rather than a virtuous, cycle, undermining wages and jobs and weakening consumption-driven demand and investment.

A NEW AGE OF DYNAMISM?

What can businesses and governments do to capitalize on the positive short- and medium-term outlook for productivity and to improve the long-term outlook? First, they should work to speed up technology adoption and managerial innovation, helping these changes spread within and across sectors. As the recovery begins, firms that have until recently been focused on crisis management and survival should follow the lead of superstar firms by investing in technology and reorganization. The superstars can assist in this process by supporting their broader ecosystems, in particular by doing business with smaller firms that offer complementary products and services. Governments can support the process, as well, by investing in research and development.

Policymakers should also seek to strengthen competition and business dynamism. In a healthy economy, the firms that add the most value prosper and grow, while the firms that add the least value shrink or disappear: so-called creative destruction. Policymakers can revive and reinforce this natural sorting process by revising competition rules, bankruptcy procedures, and product and labor-market regulations.

Governments and businesses should also aim to bolster demand and encourage business investment, the other half of the virtuous productivity cycle. As government spending tapers off, businesses should play their part by creating broad-based revenue growth while also finding efficiencies. Additionally, they should spend more on upgrading the skills of their employees, helping them make the most of technological and organizational innovations while also reducing inequality and unemployment. Governments can incentivize such investments in human capital through tax credits that encourage retraining and by shifting the tax burden away from labor income and toward capital income.

But productivity growth isn’t everything, especially as it is measured and projected today. It does not capture important dimensions of individual and social well-being that may be significantly augmented in the post-pandemic environment. For instance, the spread of digital technologies could foster more inclusive patterns of growth, and telemedicine could deliver timely primary health-care services to millions in the developing world. Nor do measures of productivity growth account for some of the negative externalities associated with modern innovations, which will compound over time and profoundly affect people’s quality of life.

What is perhaps most notable is that productivity as it is currently measured does not account for climate change. To mitigate that risk around the world, significant investment in technologies that make energy greener and more efficient is needed. Some of this investment will increase productivity growth. Electric vehicles, for instance, are not just good for the environment; they also require less labor to produce and so raise productivity. To the extent that energy-efficient investments divert resources and talent away from other, even more potentially productive areas of the economy, they could dampen short-term productivity growth. Over the long term, however, their effect will be positive, since they will prevent a dramatic decline in future productivity, among other catastrophic outcomes. Many of these gains may never be captured by the standard productivity measures, since the gains will represent a downturn that never occurred. But some of the productivity gains could eventually be captured, especially those related to infrastructure designed to help the economy adapt to climate change.

As they prepare to exit the pandemic, governments and businesses alike will have to balance these short- and long-term goals. Yet even now, as COVID-19 continues to exact a human and economic toll, a potential upside appears to be emerging. After years of sluggish productivity and economic growth following the 2008 global financial crisis, COVID-19 has triggered a frenzy of technological and organizational innovation. Whether this frenzy leads to a new age of dynamism will depend on what governments and businesses do to sustain a virtuous cycle of ever-greater productivity.

#### Slow growth collapses the liberal order AND causes global hotspot escalation---it culminates in numerous existential risks.

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Four structural forces will shape the future of International Relations: globalization (but without liberal rules, institutions, and leadership)1; multipolarity (the end of American hegemony and wider distribution of power among states and non-states2); the strengthening of distinctive, national and subnational identities, as persistent cultural differences are accentuated by the disruptive effects of Western style globalization (what Samuel Huntington called the “non-westernization of IR”3); and secular economic stagnation, a product of longer term global decline in birth rates combined with aging populations.4 These structural forces do not determine everything. Environmental events, global health challenges, internal political developments, policy mistakes, technology breakthroughs or failures, will intersect with structure to define our future. But these four structural forces will impact the way states behave, in the capacity of great powers to manage their differences, and to act collectively to settle, rather than exploit, the inevitable shocks of the next decade.

Some of these structural forces could be managed to promote prosperity and avoid war. Multipolarity (inherently more prone to conflict than other configurations of power, given coordination problems)5 plus globalization can work in a world of prosperity, convergent values, and effective conflict management. The Congress of Vienna system achieved relative peace in Europe over a hundred-year period through informal cooperation among multiple states sharing a fear of populist revolution. It ended decisively in 1914. Contemporary neoliberal institutionalists, such as John Ikenberry, accept multipolarity as our likely future, but are confident that globalization with liberal characteristics can be sustained without American hegemony, arguing that liberal values and practices have been fully accepted by states, global institutions, and private actors as imperative for growth and political legitimacy.6 Divergent values plus multipolarity can work, though at significantly lower levels of economic growth-in an autarchic world of isolated units, a world envisioned by the advocates of decoupling, including the current American president.7 Divergent values plus globalization can be managed by hegemonic power, exemplified by the decade of the 1990s, when the Washington Consensus, imposed by American leverage exerted through the IMF and other U.S. dominated institutions, overrode national differences, but with real costs to those states undergoing “structural adjustment programs,”8 and ultimately at the cost of global growth, as states—especially in Asia—increased their savings to self insure against future financial crises.9

But all four forces operating simultaneously will produce a future of increasing internal polarization and cross border conflict, diminished economic growth and poverty alleviation, weakened global institutions and norms of behavior, and reduced collective capacity to confront emerging challenges of global warming, accelerating technology change, nuclear weapons innovation and proliferation. As in any effective scenario, this future is clearly visible to any keen observer. We have only to abolish wishful thinking and believe our own eyes.10

Secular Stagnation

This unbrave new world has been emerging for some time, as US power has declined relative to other states, especially China, global liberalism has failed to deliver on its promises, and totalitarian capitalism has proven effective in leveraging globalization for economic growth and political legitimacy while exploiting technology and the state’s coercive powers to maintain internal political control. But this new era was jumpstarted by the world financial crisis of 2007, which revealed the bankruptcy of unregulated market capitalism, weakened faith in US leadership, exacerbated economic deprivation and inequality around the world, ignited growing populism, and undermined international liberal institutions. The skewed distribution of wealth experienced in most developed countries, politically tolerated in periods of growth, became intolerable as growth rates declined. A combination of aging populations, accelerating technology, and global populism/nationalism promises to make this growth decline very difficult to reverse. What Larry Summers and other international political economists have come to call “secular stagnation” increases the likelihood that illiberal globalization, multipolarity, and rising nationalism will define our future. Summers11 has argued that the world is entering a long period of diminishing economic growth. He suggests that secular stagnation “may be the defining macroeconomic challenge of our times.” Julius Probst, in his recent assessment of Summers’ ideas, explains:

…rich countries are ageing as birth rates decline and people live longer. This has pushed down real interest rates because investors think these trends will mean they will make lower returns from investing in future, making them more willing to accept a lower return on government debt as a result.

Other factors that make investors similarly pessimistic include rising global inequality and the slowdown in productivity growth…

This decline in real interest rates matters because economists believe that to overcome an economic downturn, a central bank must drive down the real interest rate to a certain level to encourage more spending and investment… Because real interest rates are so low, Summers and his supporters believe that the rate required to reach full employment is so far into negative territory that it is effectively impossible.

…in the long run, more immigration might be a vital part of curing secular stagnation. Summers also heavily prescribes increased government spending, arguing that it might actually be more prudent than cutting back – especially if the money is spent on infrastructure, education and research and development.

Of course, governments in Europe and the US are instead trying to shut their doors to migrants. And austerity policies have taken their toll on infrastructure and public research. This looks set to ensure that the next recession will be particularly nasty when it comes… Unless governments change course radically, we could be in for a sobering period ahead.12

The rise of nationalism/populism is both cause and effect of this economic outlook. Lower growth will make every aspect of the liberal order more difficult to resuscitate post-Trump. Domestic politics will become more polarized and dysfunctional, as competition for diminishing resources intensifies. International collaboration, ad hoc or through institutions, will become politically toxic. Protectionism, in its multiple forms, will make economic recovery from “secular stagnation” a heavy lift, and the liberal hegemonic leadership and strong institutions that limited the damage of previous downturns, will be unavailable. A clear demonstration of this negative feedback loop is the economic damage being inflicted on the world by Trump’s trade war with China, which— despite the so-called phase one agreement—has predictably escalated from negotiating tactic to imbedded reality, with no end in sight. In a world already suffering from inadequate investment, the uncertainties generated by this confrontation will further curb the investments essential for future growth. Another demonstration of the intersection of structural forces is how populist-motivated controls on immigration (always a weakness in the hyper-globalization narrative) deprives developed countries of Summers’ recommended policy response to secular stagnation, which in a more open world would be a win-win for rich and poor countries alike, increasing wage rates and remittance revenues for the developing countries, replenishing the labor supply for rich countries experiencing low birth rates.

Illiberal Globalization

Economic weakness and rising nationalism (along with multipolarity) will not end globalization, but will profoundly alter its character and greatly reduce its economic and political benefits. Liberal global institutions, under American hegemony, have served multiple purposes, enabling states to improve the quality of international relations and more fully satisfy the needs of their citizens, and provide companies with the legal and institutional stability necessary to manage the inherent risks of global investment. But under present and future conditions these institutions will become the battlegrounds—and the victims—of geopolitical competition. The Trump Administration’s frontal attack on multilateralism is but the final nail in the coffin of the Bretton Woods system in trade and finance, which has been in slow but accelerating decline since the end of the Cold War. Future American leadership may embrace renewed collaboration in global trade and finance, macroeconomic management, environmental sustainability and the like, but repairing the damage requires the heroic assumption that America’s own identity has not been fundamentally altered by the Trump era (four years or eight matters here), and by the internal and global forces that enabled his rise. The fact will remain that a sizeable portion of the American electorate, and a monolithically proTrump Republican Party, is committed to an illiberal future. And even if the effects are transitory, the causes of weakening global collaboration are structural, not subject to the efforts of some hypothetical future US liberal leadership. It is clear that the US has lost respect among its rivals, and trust among its allies. While its economic and military capacity is still greatly superior to all others, its political dysfunction has diminished its ability to convert this wealth into effective power.13 It will furthermore operate in a future system of diffusing material power, diverging economic and political governance approaches, and rising nationalism. Trump has promoted these forces, but did not invent them, and future US Administrations will struggle to cope with them.

What will illiberal globalization look like? Consider recent events. The instruments of globalization have been weaponized by strong states in pursuit of their geopolitical objectives. This has turned the liberal argument on behalf of globalization on its head. Instead of interdependence as an unstoppable force pushing states toward collaboration and convergence around market-friendly domestic policies, states are exploiting interdependence to inflict harm on their adversaries, and even on their allies. The increasing interaction across national boundaries that globalization entails, now produces not harmonization and cooperation, but friction and escalating trade and investment disputes.14 The Trump Administration is in the lead here, but it is not alone. Trade and investment friction with China is the most obvious and damaging example, precipitated by China’s long failure to conform to the World Trade Organization (WTO) principles, now escalated by President Trump into a trade and currency war disturbingly reminiscent of the 1930s that Bretton Woods was designed to prevent. Financial sanctions against Iran, in violation of US obligations in the Joint Comprehensive Plan Of Action (JCPOA), is another example of the rule of law succumbing to geopolitical competition. Though more mercantilist in intent than geopolitical, US tariffs on steel and aluminum, and their threatened use in automotives, aimed at the EU, Canada, and Japan,15 are equally destructive of the liberal system and of future economic growth, imposed as they are by the author of that system, and will spread to others. And indeed, Japan has used export controls in its escalating conflict with South Korea16 (as did China in imposing controls on rare earth,17 and as the US has done as part of its trade war with China). Inward foreign direct investment restrictions are spreading. The vitality of the WTO is being sapped by its inability to complete the Doha Round, by the proliferation of bilateral and regional agreements, and now by the Trump Administration’s hold on appointments to WTO judicial panels. It should not surprise anyone if, during a second term, Trump formally withdrew the US from the WTO. At a minimum it will become a “dead letter regime.”18

As such measures gain traction, it will become clear to states—and to companies—that a global trading system more responsive to raw power than to law entails escalating risk and diminishing benefits. This will be the end of economic globalization, and its many benefits, as we know it. It represents nothing less than the subordination of economic globalization, a system which many thought obeyed its own logic, to an international politics of zero-sum power competition among multiple actors with divergent interests and values. The costs will be significant: Bloomberg Economics estimates that the cost in lost US GDP in 2019- dollar terms from the trade war with China has reached $134 billion to date and will rise to a total of $316 billion by the end of 2020.19

Economically, the just-in-time, maximally efficient world of global supply chains, driving down costs, incentivizing innovation, spreading investment, integrating new countries and populations into the global system, is being Balkanized. Bilateral and regional deals are proliferating, while global, nondiscriminatory trade agreements are at an end. Economies of scale will shrink, incentivizing less investment, increasing costs and prices, compromising growth, marginalizing countries whose growth and poverty reduction depended on participation in global supply chains. A world already suffering from excess savings (in the corporate sector, among mostly Asian countries) will respond to heightened risk and uncertainty with further retrenchment. The problem is perfectly captured by Tim Boyle, CEO of Columbia Sportswear, whose supply chain runs through China, reacting to yet another ratcheting up of US tariffs on Chinese imports, most recently on consumer goods:

We move stuff around to take advantage of inexpensive labor. That’s why we’re in Bangladesh. That’s why we’re looking at Africa. We’re putting investment capital to work, to get a return for our shareholders. So, when we make a wager on investment, this is not Vegas. We have to have a reasonable expectation we can get a return. That’s predicated on the rule of law: where can we expect the laws to be enforced, and for the foreseeable future, the rules will be in place? That’s what America used to be.20

The international political effects will be equally damaging. The four structural forces act on each other to produce the more dangerous, less prosperous world projected here. Illiberal globalization represents geopolitical conflict by (at first) physically non-kinetic means. It arises from intensifying competition among powerful states with divergent interests and identities, but in its effects drives down growth and fuels increased nationalism/populism, which further contributes to conflict. Twenty-first-century protectionism represents bottom-up forces arising from economic disruption. But it is also a top-down phenomenon, representing a strategic effort by political leadership to reduce the constraints of interdependence on freedom of geopolitical action, in effect a precursor and enabler of war. This is the disturbing hypothesis of Daniel Drezner, argued in an important May 2019 piece in Reason, titled “Will Today’s Global Trade Wars Lead to World War Three,”21 which examines the preWorld War I period of heightened trade conflict, its contribution to the disaster that followed, and its parallels to the present:

Before the First World War started, powers great and small took a variety of steps to thwart the globalization of the 19th century. Each of these steps made it easier for the key combatants to conceive of a general war.

We are beginning to see a similar approach to the globalization of the 21st century. One by one, the economic constraints on military aggression are eroding. And too many have forgotten—or never knew—how this played out a century ago.

…In many ways, 19th century globalization was a victim of its own success. Reduced tariffs and transport costs flooded Europe with inexpensive grains from Russia and the United States. The incomes of landowners in these countries suffered a serious hit, and the Long Depression that ran from 1873 until 1896 generated pressure on European governments to protect against cheap imports.

…The primary lesson to draw from the years before 1914 is not that economic interdependence was a weak constraint on military conflict. It is that, even in a globalized economy, governments can take protectionist actions to reduce their interdependence in anticipation of future wars.

In retrospect, the 30 years of tariff hikes, trade wars, and currency conflicts that preceded 1914 were harbingers of the devastation to come. European governments did not necessarily want to ignite a war among the great powers. By reducing their interdependence, however, they made that option conceivable.

…the backlash to globalization that preceded the Great War seems to be reprised in the current moment. Indeed, there are ways in which the current moment is scarier than the pre-1914 era. Back then, the world’s hegemon, the United Kingdom, acted as a brake on economic closure. In 2019, the United States is the protectionist with its foot on the accelerator. The constraints of Sino-American interdependence—what economist Larry Summers once called “the financial balance of terror”—no longer look so binding. And there are far too many hot spots—the Korean peninsula, the South China Sea, Taiwan—where the kindling seems awfully dry.

Multipolarity

We can define multipolarity as a wide distribution of power among multiple independent states. Exact equivalence of material power is not implied. What is required is the possession by several states of the capacity to coerce others to act in ways they would otherwise not, through kinetic or other means (economic sanctions, political manipulation, denial of access to essential resources, etc.). Such a distribution of power presents inherently graver challenges to peace and stability than do unipolar or bipolar power configurations,22 though of course none are safe or permanent. In brief, the greater the number of consequential actors, the greater the challenge of coordinating actions to avoid, manage, or de-escalate conflicts. Multipolarity also entails a greater potential for sudden changes in the balance of power, as one state may defect to another coalition or opt out, and as a result, the greater the degree of uncertainty experienced by all states, and the greater the plausibility of downside assumptions about the intentions and capabilities of one’s adversaries. This psychology, always present in international politics but particularly powerful in multipolarity, heightens the potential for escalation of minor conflicts, and of states launching preventive or preemptive wars. In multipolarity, states are always on edge, entertaining worst-case scenarios about actual and potential enemies, and acting on these fears—expanding their armies, introducing new weapon systems, altering doctrine to relax constraints on the use of force—in ways that reinforce the worst fears of others.

The risks inherent in multipolarity are heightened by the attendant weakening of global institutions. Even in a state-centric system, such institutions can facilitate communication and transparency, helping states to manage conflicts by reducing the potential for misperception and escalation toward war. But, as Waheguru Pal Singh Sidhu argues in his chapter on the United Nations, the influence of multilateral institutions as agent and actor is clearly in decline, a result of bottom-up populist/nationalist pressures experienced in many countries, as well as the coordination problems that increase in a system of multiple great powers. As conflict resolution institutions atrophy, great powers will find themselves in “security dilemmas”23 in which verification of a rival’s intentions is unavailable, and worst-case assumptions fill the gap created by uncertainty. And the supply of conflicts will expand as a result of growing nationalism and populism, which are premised on hostility, paranoia, and isolation, with governments seeking political legitimacy through external conflict, producing a siege mentality that deliberately cuts off communication with other states.

Finally, the transition from unipolarity (roughly 1989–2007) to multipolarity is unregulated and hazardous, as the existing superpower fears and resists challenges to its primacy from a rising power or powers, while the rising power entertains new ambitions as entitlements now within its reach. Such a “power transition” and its dangers were identified by Thucydides in explaining the Peloponnesian Wars,24 by Organski (the “rear-end collision”)25 during the Cold War, and recently repopularized and brought up to date by Graham Allison in predicting conflict between the US and China.26

A useful, and consequential illustration of the inherent challenge of conflict management during a power transition toward multipolarity, is the weakening of the arms control regime negotiated by the US and the Soviet Union during the Cold War. Despite the existential, global conflict between two nuclear armed superpowers embracing diametrically opposed world views and operating in economic isolation from each other, the two managed to avoid worst-case outcomes. They accomplished this in part by institutionalizing verifiable limits on testing and deployment of both strategic and intermediate-range nuclear missiles. Yet as diplomatically and technically challenging as these achievements were, the introduction of a third great power, China, into this twocountry calculus has proven to be a deal breaker. Unconstrained by these bilateral agreements, China has been free to build up its capability, and has taken full advantage in ramping up production and deployment of intermediate-range ground-launched cruise missiles, thus challenging the US ability to credibly guarantee the security of its allies in Asia, and greatly increasing the costs of maintaining its Asian regional hegemony. As a result, the Intermediate Nuclear Force treaty is effectively dead, and the New Start Treaty, covering strategic missiles, is due to expire next year, with no indication of any US–Russian consensus to extend it. The US has with logic indicated its interest in making these agreements trilateral; but China, with its growing power and ambition, has also logically rejected these overtures. Thus, all three great powers are entering a period of nuclear weapons competition unconstrained by the major Cold War arms control regimes. In a period of rapid advances in technology and worsening great power relations, the nuclear competition will be a defining characteristic of the next decade and beyond. This dynamic will also complicate nuclear nonproliferation efforts, as both the demand for nuclear weapons (a consequence of rising regional and global insecurity), and supply of nuclear materials and technology (a result of the weakening of the nonproliferation regime and deteriorating great power relations) will increase.

Will deterrence prevent war in a world of several nuclear weapons states, (the current nuclear powers plus South Korea, Iran, Saudi Arabia, Japan, Turkey), as it helped to do during the bipolar Cold War? Some neorealist observers view nuclear weapons proliferation as stabilizing, extending the balance of terror, and the imperative of restraint, to new nuclear weapons states with much to fight over (Saudi Arabia and Iran, for example).27 Others,28 examining issues of command and control of nuclear weapons deployment and use by newly acquiring states, asymmetries in doctrines, force structures, and capabilities between rivals, the perils of variable rates in transition to weapons deployment, problems of communication between states with deep mutual grievances, the heightened risk of transfer of such weapons to non-state actors, have grave doubts about the safety of a multipolar, nuclear-armed world.29 We can at least conclude that prudence dictates heightened efforts to slow the pace of proliferation, while realism requires that we face a proliferated future with eyes wide open.

The current distribution of power is not perfectly multipolar. The US still commands the world’s largest economy, and its military power is unrivaled by any state or combination of states. Its population is still growing, despite a recent decline in birth rates. It enjoys extraordinary geographic advantages over its rivals, who are distant and live in far worse neighborhoods. Its economy is less dependent on foreign markets or resources. Its political system has proven—up to now—to be resilient and adaptable. Its global alliance system greatly extends its capacity to defend itself and shape the world to its liking and is still intact, despite growing doubts about America’s reliability as a security guarantor. Based on these mostly material and historical criteria, continued American primacy would seem to be a good bet, if it chooses to use its power in this way.30

So why multipolarity? The clearest and most frequently cited evidence for a widening distribution of global power away from American unipolarity is the narrowing gap in GDP between the US and China. The IMF’s World Economic Outlook forecasts a $0.9 trillion increase in US GDP for 2019–2020, and a $1.3 trillion increase for China in the same period.31 Many who support the American primacy case argue that GDP is an imperfect measure of power, that Chinese GDP data is inflated, that its growth rates are in decline while Chinese debt is rapidly increasing, and that China does poorly on other factors that contribute to power—its low per capita GDP, its political succession challenges, its environmental crisis, its absence of any external alliance system. Yet GDP is a good place to start, as the single most useful measure and long-term predictor of power. It is from the overall economy that states extract and apply material power to leverage desired behavior from other states. It is true that robust future Chinese growth is not guaranteed, nor is its capacity to convert its wealth to power, which is a function of how well its political system works over time. But this is equally the case for the US, and considering recent political developments is not a given for either country.

As an alternative to measuring inputs—economic size, political legitimacy, technological innovation, population growth—in assessing relative power and the nature of global power distribution, we should consider outputs: what are states doing with their power? The input measures are useful, possibly predictive, but are usually deployed in the course of making a foreign policy argument, sometimes on behalf of a reassertion of American primacy, sometimes on behalf of retrenchment. As such, their objectivity (despite their generous deployment of “data”) is open to question. What is undeniable, to any clear-eyed observer, is a real decline in American influence in the world, and a rise in the influence of other powers, which predates the Trump administration but has accelerated into America’s free fall over the last four years. This has produced a de facto multipolarity, whether explainable in the various measures of power—actual and latent—or not. This decline results in part from policy mistakes: a reckless squandering of material power and legitimacy in Iraq, an overabundance of caution in Syria, and now pure impulsivity. But more fundamentally, it is a product of relative decline in American capacity—political and economic—to which American leadership is adjusting haphazardly, but in the direction of retrenchment/restraint. It is highly revealing that the last two American presidents, polar opposites in intellect, temperament and values, agreed on one fundamental point: the US is overextended, and needs to retrench. The fact that neither Obama nor Trump (up to this point in his presidency) believed they had the power at their disposal to do anything else, tells us far more about the future of American power and policy—and about the emerging shape of international relations—than the power measures and comparisons made by foreign policy advocates.

Observation of recent trends in US versus Russian relative influence prompts another question: do we understand the emerging characteristics of power? Rigorously measuring and comparing the wrong parameters will get us nowhere at best and mislead us into misguided policies at worst. How often have we heard, with puzzlement, that Putin punches far above his weight? Could it be that we misunderstand what constitutes “weight” in the contemporary and emerging world? Putin may be on a high wire, and bound to come crashing down; but the fact is that Russian influence, leveraging sophisticated communications/social media/influence operations, a strong military, an agile (Putin-dominated) decision process, and taking advantage of the egregious mistakes by the West, has been advancing for over a decade, shows no sign of slowing down, and has created additional opportunities for itself in the Middle East, Europe, Asia, Latin America, the Arctic. It has done this with an economy roughly the size of Italy’s. There are few signs of a domestic political challenge to Putin. His external opponents are in disarray, and Russia’s main adversary is politically disabled from confronting the problem. He has established Russia as the Middle East power broker. He has reached into the internal politics of his Western adversaries and influenced their leadership choices. He has invaded and absorbed the territory of neighboring states. His actions have produced deep divisions within NATO. Again, simple observation suggests multipolarity in fact, and a full explanation for this power shift awaiting future historians able to look with more objectivity at twenty-first-century elements of power.

When that history is written, surely it will emphasize the extraordinary polarization in American politics. Was multipolarity a case of others finding leverage in new sources of power, or the US underutilizing its own? The material measures suggest sufficient capacity for sustained American primacy, but with this latent capacity unavailable (as perceived, I believe correctly, by political leadership) by virtue of weakening institutions: two major parties in separate universes; a winnertake-all political mentality; deep polarization between the parties’ popular bases of support; divided government, with the Presidency and the Congress often in separate and antagonistic hands; diminishing trust in the permanent government, and in the knowledge it brings to important decisions, and deepening distrust between the intelligence community and policymakers; and, in Trump’s case, a chaotic policy process that lacks any strategic reference points, mis-communicates the Administration’s intentions, and has proven incapable of sustained, coherent diplomacy on behalf of any explicit and consistent set of policy goals.

Rising Nationalism/Populism/Authoritarianism

The evidence for these trends is clear. Freedom House, the go-to authority on the state of global democracy, just published its annual assessment for 2020, and recorded the fourteenth consecutive year of global democratic decline and advancing authoritarianism. This dramatic deterioration includes both a weakening in democratic practice within states still deemed on balance democratic, and a shift from weak democracies to authoritarianism in others. Commitment to democratic norms and practices—freedom of speech and of the press, independent judiciaries, protection of minority rights—is in decline. The decline is evident across the global system and encompasses all major powers, from India and China, to Europe, to the US. Right-wing populist parties have assumed power, or constitute a politically significant minority, in a lengthening list of democratic states, including both new (Hungary, Poland) and established (India, the US, the UK) democracies. Nationalism, frequently dismissed by liberal globalization advocates as a weak force when confronted by market democracies’ presumed inherent superiority, has experienced a resurgence in Russia, China, the Middle East, and at home. Given the breadth and depth of right-wing populism, the raw power that promotes it—mainly Russian and American—and the disarray of its liberal opponents, this factor will weigh heavily on the future.

The major factors contributing to right-wing populism and its global spread is the subject of much discussion.32 The most straightforward explanation is rising inequality and diminished intergenerational mobility, particularly in developed countries whose labor-intensive manufacturing has been hit hardest by the globalization of capital combined with the immobility of labor. Jobs, wages, economic security, a reasonable hope that one’s offspring has a shot at a better life than one’s own, the erosion of social capital within economically marginalized communities, government failure to provide a decent safety net and job retraining for those battered by globalization: all have contributed to a sense of desperation and raw anger in the hollowed-out communities of formerly prosperous industrial areas. The declining life expectancy numbers33 tell a story of immiseration: drug addition, suicide, poor health care, and gun violence. The political expression of such conditions of life should not be surprising. Simple, extremist “solutions” become irresistible. Sectarian, racial, regional divides are strengthened, and exclusive identities are sharpened. Political entrepreneurs offering to blow up the system blamed for such conditions become credible. Those who are perceived as having benefited from the corrupt system—long-standing institutions of government, foreign countries and populations, immigrants, minorities getting a “free ride,” elites—become targets of recrimination and violence. The simple solutions of course, don’t work, deepening the underlying crisis, but in the process politics is poisoned. If this sounds like the US, it should, but it also describes major European countries (the UK, France, Italy, Germany, Poland, Hungary, the Czech Republic), and could be an indication of things to come for non-Western democracies like India.

We have emphasized throughout this chapter the interaction of four structural forces in shaping the future, and this interaction is evident here as well. Is it merely coincidence that the period of democratic decline documented by Freedom House, coincides precisely with the global financial and economic crisis? Lower growth, increasing joblessness, wage stagnation, superimposed on longer-term widening of inequality and declining mobility, constitute a forbidding stress test for democratic systems, and many continue to fail. And if we are correct about secular stagnation, the stress will continue, and authoritarianism’s fourteen-year run will not be over for some time. The antidemocratic trend will gain additional impetus from the illiberal direction of globalization, with its growth suppressing protectionism, weaponization of global economic exchange, and weakening global economic institutions. Multipolarity also contributes, in several ways. The former hegemon and author of globalization’s liberal structure has lost its appetite, and arguably its capacity, for leadership, and indeed has become part of the problem, succumbing to and promoting the global right-wing populist surge. It is suffering an unprecedented decline in life expectancy, and recently a decline in the birth rate, signaling a degree of rot commonly associated with a collapsing Soviet Union. While American politics may once again cohere around its liberal values and interests, the time when American leadership had the self-confidence to shape the global system in its liberal image is gone. It may build coalitions of the like-minded to launch liberal projects, but there will be too much power outside these coalitions to permit liberal globalization of the sort imagined at the end of the Cold War. In multipolarity, the values around which global politics revolve will reflect the diversity of major powers, their interests, and the norms they embrace. Convergence of norms, practices, policies is out of the question. Global collective action, even in the face of global crises, will be a long shot. To expect anything else is fantasy

Unbrave New World and Future Challenges

At the outset of this chapter we described these structural forces as interacting to produce more conflict and diminished prosperity. We also predicted a world with shrinking collective capacity to address new challenges as they arise. What specifically will such a world look like? We address below three principal challenges to global problem solving over the next decade.

Interstate Conflict

In the world experienced by most readers of this volume, conflict is observed within weak states, sometimes promoted by regional competitors, by terrorist groups, or by great powers, acting through surrogates or by indirect means. Sometimes, as in Syria, this conflict spills over to contiguous states and contributes to regional instability, and challenges other regions to respond effectively, a challenge that Europe has not met. Much of this will continue, but the global significance of such local conflicts will be greatly magnified by increasing great power conflict, which will feed—rather than manage or resolve—local instabilities and will in turn be exacerbated by them. Great powers will jockey for advantage, support their local partners, escalate preemptively. Conflicts initially confined to failing states or unstable regions will be redefined by great powers as global in scope and significance.

This tendency of states to view local conflicts in the context of a zero-sum, global struggle for power is familiar to students of the Cold War, but now with the additional challenges to collective action, expanded uncertainty and worst-case thinking associated with the power transition to multipolarity. We can easily observe increased conflict in US–China relations, as we will in US–Russia relations as future US administrations try to make up for ground lost during the Trump presidency, especially in the Middle East. We can observe it among powerful states with mutual historical grievances, now with a weakening presence of the hegemonic security guarantor and having to consider the renationalization of their defense: Japan-South Korea, Germany-France. We can observe it among historical rivals operating in rapidly changing security landscapes: India-China. We can observe it within the Middle East, as internal rivalries are appropriated by regional powers in a contest for regional dominance. We can observe it clearly in Syria, where the regime’s violent suppression of Arab Spring resistance led to all-out civil war, attracted outside support to proxy forces by aspiring regional hegemons Saudi Arabia and Iran, enabled the rise of ISIS, and eventually to great power intervention, principally by Russia. In a world of effective great power collaboration or American primacy, the Syrian civil war might have been settled through power sharing or partition, or if not, contained within Syria. The collapse of Yugoslavia, occurring during a period of US “unipolarity” and managed effectively, demonstrates the possibilities. Instead, with the US retrenching, Middle East rivals unconstrained by great powers, and great power competition rising, the Syria civil war was fed by outside powers, then metastasized into the region, and—in the form of refugee flows—into Europe, fundamentally altering European politics. Libya may be at the early stages of this scenario.

This is not the end of the Syria story. Russia has established itself as a major player in Syria and the Middle East’s power broker, the indispensable country with leverage throughout the region. China is poised to reap the financial and power benefits of Syrian reconstruction. The US has just demonstrated, in its act of war against the Iranian regime, its willingness, without consultation, to put its allies’ security in further jeopardy, accentuating the risks of security ties with Washington and generating added opportunities for Russia and China. The purpose here is not to critique US policy, but to point out the dramatically shifting power balance in a critical region, toward multipolarity. The dangers of such a shift will become apparent as some future US president attempts to reassert US influence in the region and finds a crowded playing field.

Can a multipolar distribution of power among several states whose interests, values, and political practices are divergent, all experiencing bottom-up nationalist pressures, all seeking advantages in the oversupply of regional instability, be made to work? I think not. Will this more dangerous world descend into direct military confrontation between great powers, and could such confrontation lead to use of nuclear weapons? Here the question becomes, what will this more dangerous world actually look like; what instruments of coercion will be available to states as technology change accelerates; how will states employ these instruments; how will deterrence work (if at all) among several states with large but unequal levels of destructive capacity, weak command, and control, disparate— or opaque—strategies and simmering rivalries; can conflict management work in a world of weak institutions? The collapse of the Cold War era nuclear arms control regime, the threat to the Non-Proliferation Treaty represented by the demise of the JCPOA, and multiple indications of an accelerating nuclear arms race among the three principle powers, augurs badly. Given the structural forces at play, and without predicting the worst, we are indeed entering perilous times.

Global Poverty and Inequality

Despite the challenges of volatility and disruptive change inherent in globalization, the world under American liberal leadership has managed a dramatic reduction of extreme poverty. According to World Bank estimates, in 2015, 10 percent of the world’s population lived on less than $1.90 a day, down from nearly 36 percent in 1990.34 In fact, as of September 2018, half the world is now middle class or wealthier.35 The uneven success of the UN Millennium Development Goals (MDGs) exemplifies this achievement, and demonstrates what is possible when open markets are managed through strong global institutions, effective leadership and interstate collaboration. What this liberal hegemonic system did not achieve, however, was a fair distribution of the gains from globalization within states, and among those states that for various reasons were not full participants in this system.

This record of partial achievement leaves us with a full agenda for the next fifteen years, but without the hegemonic leadership, strong institutions, ascendant liberalism or robust global growth that enabled previous gains. There are powerful reasons to question the sustainability of these poverty reduction gains, leading to doubts about the realization of the Sustainable Development Goals, which have replaced the MDGs as global development targets.36 (See Jens Rudbeck’s chapter and Sidhu’s UN chapter for SDGs). Skeptics have pointed to slowing global growth, specifically in China, whose demand for imported commodities was a major factor in developing country growth and job creation; growing protectionism in developed country markets, fueled by bottom-up forces of nationalism, and from top-down by a weakened global trading regime and increased geopolitical rivalry; the effects of accelerating climate change on agriculture, migration and communal conflict in poor countries; and the growth burst among poor countries from the rapid transition to more efficient use of resources, a transition that is now slowing down.37

Perhaps the greatest concern in this scenario is a general deterioration in the developing country foreign investment climate. Foreign direct investment (FDI) has been a major contributor to growth, job creation, and poverty alleviation among poor countries. It has incentivized growthfriendly policies, reduced corruption, introduced technology and effective management practices, and linked poor countries to foreign markets through global supply chains.38 It has stimulated growth of indigenous manufacturing and service companies to supply new foreign investments.

It has been the major cause of economic convergence between rich and poor countries. From 2000 to 2009, developing economies’ growth rates were more than four percentage points higher than those of rich countries, pushing their share of global output from just over a third to nearly half.39 However, FDI flows into poor countries are imperiled by the structural forces discussed here. Political instability arising from slower growth and environmental stress will increase investors’ perception of higher risk, reinforcing their developed country bias. Protectionism among developed countries will threaten the global market access upon which manufacturing investment in developing countries is premised, causing firms to pare back their global supply chains. As companies retrench from direct investment in poor countries, the appeal to those countries of Chinese debt financed infrastructure projects, under the Belt-Road Initiative with little or no conditionality, but at the risk of “debt traps,” will increase.

Global Warming

The question posed at the beginning of this section is whether the international system, evolving toward multipolarity and rising nationalism, will find the collective political capital to confront challenges as they arise. Global warming is the mother of all challenges, and the weakness in the system’s capacity to respond is clear. With the two major political/economic powers and greenhouse gas emitters locked in deepening geopolitical conflict (and with one of them locked in climate change denial, possibly through 2024), the chances of significantly slowing global warming or even ameliorating its effects are very slim. We are reduced to the default option, nation-specific adaptation to climate change, which will impose rising human, political and economic costs on all, and will widen the gap between rich countries with adaptive capacity (of varying degrees), and the poor, who will suffer deteriorating economic, political, and social conditions. (For a contrary, optimistic view see Michael Shank’s chapter, which credits new actors—like cities—as playing a more constructive role in climate mitigation.) This would bring to a close liberal globalization’s greatest achievement; the raising of 1.1 billion people out of extreme poverty since 1990,40 with all its associated gains in quality of life (in the WHO Africa region, for example, life expectancy rose by 10.3 years between 2000 and 2016, driven mainly by improvements in child survival and expanded access to antiretrovirals for treatment of HIV).41

Several forces are at work here. The problem itself is graver—in magnitude and in rate of worsening—than predicted by climate scientists. The UN Intergovernmental Panel on Climate Change (IPCC), the major source of information on global warming, has consistently underpredicted the rate of climate deterioration. This holds true even for its “worst-case scenarios,” meaning that what was meant as a wake-up call has in fact reinforced complacency.42 (see Michael Shank’s chapter for further discussion of climate change). The IPCC, in its 2019 report, has tried to undo the damage by emphasizing the acceleration in the rate of warming and its effects, the only partially understood dynamic of climate change, and—given wide uncertainty—the possibility of unpleasant surprises yet to come. This strengthens the scientific case for urgency—to both severely limit greenhouse gas emissions, and to increase investment in ameliorating the effects.

Unfortunately, the crisis comes at a moment when the climate for collective action is ice cold. Geopolitical competition incentivizes states to out produce each other, regardless of the environmental effects. Multipolarity complicates collective action. Economic stagnation mandates job creation, making regulation politically toxic. Bottom-up nationalism/populism causes states to pursue “relative gains,” meaning that if the nation is seen as gaining in a no-holds-barred economic competition with others, the negative environmental effects can be tolerated. A post-Trump presidency would help, with the US rejoining the Paris Agreement, and lending its weight to tighter regulation, increased R and D, and stronger economic incentives to reduce carbon emissions. Keep in mind, however, that President Obama was fully behind such efforts, but in a deeply polarized America was unable to implement measures needed to fulfill the Paris obligations through legislation, and his executive orders to do this were swiftly overturned by Trump.

Conclusion

It may be tempting to hope that post-Trump, the US can regain its global leadership and exert its considerable power in a liberal direction, but with enough self-awareness of its relative decline to share responsibility with others. This was, I believe, the broad direction of the Obama strategy, evidenced by the JCPOA and the Trans-Pacific Partnership: liberal, collective solutions to global problems, as US dominance receded.

This would constitute an optimistic scenario, and it confronts two major problems: can US internal politics support it (can, for example, the country legislate controls on carbon, essential for the global credibility and durability of such commitments); and is the world ready to reengage with American leadership, given the damage to its reputation and the structural forces discussed in this chapter?

My educated guess is no, on both counts. The rot within is extensive, the concrete evidence clear in the economic inequality/immobility numbers, the life expectancy numbers, the deep political polarization, between the two major parties, between regions, between cities and rural areas. We are in fact a long way from fitness for global leadership, and the recognition of this by others will accelerate the decline of American influence. The rest of the world is well on its way toward adjusting to post-American hegemony, some by renationalizing their defense, or by cutting deals with adversaries, by building new alliances or by seizing new opportunities for influence in the vacuum left by American retrenchment. The evidence for this will accumulate. Observe the current and emerging Middle East, where all these post-hegemonic strategies are visible.

#### Extinction

Steven **Starr 17**. Director, University of Missouri’s Clinical Laboratory Science Program; senior scientist, Physicians for Social Responsibility. 1/9/2017. “Turning a Blind Eye Towards Armageddon — U.S. Leaders Reject Nuclear Winter Studies.” Federation of American Scientists. <https://fas.org/2017/01/turning-a-blind-eye-towards-armageddon-u-s-leaders-reject-nuclear-winter-studies/>

Now 10 years ago, several of the world’s leading climatologists and physicists chose to reinvestigate the long-term environmental impacts of nuclear war. The peer-reviewed studies they produced are considered to be the most authoritative type of scientific research, which is subjected to criticism by the international scientific community before final publication in scholarly journals. No serious errors were found in these studies and their findings remain unchallenged.

Alan Robock et al., “Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences,” Journal of Geophysical Research: Atmospheres 112 (2007).

Owen Brian Toon et al., “Atmospheric effects and societal consequences of regional scale nuclear conflicts and acts of individual nuclear terrorism,” Atmospheric Chemistry and Physics 7 (2007).

Michael Mills et al., “Massive global ozone loss predicted following regional nuclear conflict,” Proceedings of the National Academy of Sciences of the United States of America 105, no. 14 (2008).

Michael Mills et al., “Multidecadal global cooling and unprecedented ozone loss following a regional nuclear conflict,” Earth’s Future 2.

Alan Robock et al., “Climatic consequences of regional nuclear conflicts,” Atmospheric Chemistry and Physics 7 (2007).

Working at the Laboratory for Atmospheric and Space Physics at the University of Colorado-Boulder, the Department of Environmental Sciences at Rutgers, and the Department of Atmospheric and Oceanic Sciences at UCLA, these scientists used state-of-the-art computer modeling to evaluate the consequences of a range of possible nuclear conflicts. They began with a hypothetical war in Southeast Asia, in which a total of 100 Hiroshima-size atomic bombs were detonated in the cities of India and Pakistan. Please consider the following images of Hiroshima, before and after the detonation of the atomic bomb, which had an explosive power of 15,000 tons of TNT.

The detonation of an atomic bomb with this explosive power will instantly ignite fires over a surface area of three to five square miles. In the recent studies, the scientists calculated that the blast, fire, and radiation from a war fought with 100 atomic bombs could produce direct fatalities comparable to all of those worldwide in World War II, or to those once estimated for a “counterforce” nuclear war between the superpowers. However, the long-term environmental effects of the war could significantly disrupt the global weather for at least a decade, which would likely result in a vast global famine.

The scientists predicted that nuclear firestorms in the burning cities would cause at least five million tons of black carbon smoke to quickly rise above cloud level into the stratosphere, where it could not be rained out. The smoke would circle the Earth in less than two weeks and would form a global stratospheric smoke layer that would remain for more than a decade. The smoke would absorb warming sunlight, which would heat the smoke to temperatures near the boiling point of water, producing ozone losses of 20 to 50 percent over populated areas. This would almost double the amount of UV-B reaching the most populated regions of the mid-latitudes, and it would create UV-B indices unprecedented in human history. In North America and Central Europe, the time required to get a painful sunburn at mid-day in June could decrease to as little as six minutes for fair-skinned individuals.

As the smoke layer blocked warming sunlight from reaching the Earth’s surface, it would produce the coldest average surface temperatures in the last 1,000 years. The scientists calculated that global food production would decrease by 20 to 40 percent during a five-year period following such a war. Medical experts have predicted that the shortening of growing seasons and corresponding decreases in agricultural production could cause up to two billion people to perish from famine.

The climatologists also investigated the effects of a nuclear war fought with the vastly more powerful modern thermonuclear weapons possessed by the United States, Russia, China, France, and England. Some of the thermonuclear weapons constructed during the 1950s and 1960s were 1,000 times more powerful than an atomic bomb.

During the last 30 years, the average size of thermonuclear or “strategic” nuclear weapons has decreased. Yet today, each of the approximately 3,540 strategic weapons deployed by the United States and Russia is seven to 80 times more powerful than the atomic bombs modeled in the India-Pakistan study. The smallest strategic nuclear weapon has an explosive power of 100,000 tons of TNT, compared to an atomic bomb with an average explosive power of 15,000 tons of TNT.

Strategic nuclear weapons produce much larger nuclear firestorms than do atomic bombs. For example, a standard Russian 800-kiloton warhead, on an average day, will ignite fires covering a surface area of 90 to 152 square miles.

A war fought with hundreds or thousands of U.S. and Russian strategic nuclear weapons would ignite immense nuclear firestorms covering land surface areas of many thousands or tens of thousands of square miles. The scientists calculated that these fires would produce up to 180 million tons of black carbon soot and smoke, which would form a dense, global stratospheric smoke layer. The smoke would remain in the stratosphere for 10 to 20 years, and it would block as much as 70 percent of sunlight from reaching the surface of the Northern Hemisphere and 35 percent from the Southern Hemisphere. So much sunlight would be blocked by the smoke that the noonday sun would resemble a full moon at midnight.

Under such conditions, it would only require a matter of days or weeks for daily minimum temperatures to fall below freezing in the largest agricultural areas of the Northern Hemisphere, where freezing temperatures would occur every day for a period of between one to more than two years. Average surface temperatures would become colder than those experienced 18,000 years ago at the height of the last Ice Age, and the prolonged cold would cause average rainfall to decrease by up to 90%. Growing seasons would be completely eliminated for more than a decade; it would be too cold and dark to grow food crops, which would doom the majority of the human population.2

#### The AFF is key:

#### 1. Kronos effect---unlimited vertical acquisitions destroys lagging and entrant firms.

Kevin A. Bryan & Erik Hovenkamp 20, Assistant Professor, University of Toronto Rotman School of Management; Assistant Professor, University of Southern California Gould School of Law, "Reassessing the Chicago School of Antitrust Law: Startup Acquisitions, Error Costs, and Antitrust Policy," University of Chicago Law Review, Vol. 87, No. 331, March 2020, Lexis.

[\*331] INTRODUCTION

High tech industries are not only lucrative, but also highly innovative and dynamic. Large firms are not their sole source of innovation, however. Many valuable technologies are first developed by startup companies. Innovative startups are frequently acquired by powerful incumbents at an early stage. Well-known examples include acquisitions of WhatsApp and Instagram by Facebook; Waze and DoubleClick by Google; and GitHub and LinkedIn by Microsoft. These cases have drawn very little antitrust scrutiny, leading many commentators to question whether antitrust is in need of reform.

[\*332] This paucity of meaningful oversight is driven by uncertainty about a startup's future impact on the marketplace. Merger enforcement is usually directed at proposed combinations of large, established firms. It largely focuses on the estimated immediate effect of the proposed deal on competition. But startups are new and comparatively small, leaving little data with which to estimate competitive effects. Further, the relevant antitrust concerns relate mainly to more speculative effects on future competition. Rather than taking calculated steps to balance such uncertainties against the potential benefits of enforcement, antitrust policy has maintained a rigid policy of near-universal inaction.

This result is emblematic of a broader principle often associated with the influential Chicago School of antitrust thought, which has had significant influence on the Supreme Court in recent decades. This principle holds that antitrust should err on the side of nonintervention (false negatives), because erroneous condemnations (false positives) are seen as more socially costly. A leading rationale is that competitive entry will discipline anticompetitive behavior organically, whereas the adverse effects of erroneous intervention will persist indefinitely. This view has [\*333] spurred very demanding evidentiary requirements, making it difficult for plaintiffs to prevail in most kinds of antitrust cases.

Thus, considering the uncertainties they present, it is unsurprising that startup acquisitions have received very little antitrust scrutiny. However, a growing body of economic theory and empirics identifies various harmful effects from such acquisitions. Over time, they can expand the technological gap between industry leaders and "laggards" (smaller or less successful rivals). The product market is thus left less competitive and more concentrated. Startups are sometimes acquired by dominant firms solely to exclude rivals from accessing such technologies. In addition, incentives for innovation may also be adversely affected, as they are influenced in part by the prospect of future acquisitions. An innovator's decisions about what lines of research to invest can become skewed. Further, once a habitual acquirer becomes sufficiently dominant, its willingness to pay for new technologies falls, reducing the returns innovators receive for future inventions. Incentives for prospective startups to innovate are thus weakened.

To be sure, in most startup acquisitions, it is probably not possible to precisely predict the transaction's but-for impact on commerce. But it does not follow that society is best served by a policy that permits dominant incumbents to acquire all promising startups soon after they form. These acquisitions may have significant adverse effects in the aggregate, even if it is difficult to [\*334] assess how any particular transaction would influence the marketplace. Consequently, society may benefit from a policy that permits limited intervention based on reasonably ascertainable evidence, even if this carries some risk of false positives.

The traditional argument favoring false negatives is particularly ill-suited to this setting. There is a clear circularity problem. The driving force behind the error cost argument, competitive entry, is directly threatened by the conduct in question. One cannot expect potential entrants to discipline anticompetitive behavior if they are consistently absorbed by powerful incumbents. When the market leader is sufficiently dominant, it is generally most profitable (for both the leader and the startup) for technology rights to be sold exclusively to the leader. This softens competition by increasing the leader's technological advantage over its competitors. Hence there is no reason to expect that the market will self-correct the problem, as it is more profitable than the alternative.

This Essay is organized as follows. In Part I, we address the error cost argument and some subsequent rebuttals. Part II addresses the potential harms from startup acquisitions by dominant incumbents, provides supporting empirical evidence, and explains why current merger policy is unlikely to provide a satisfactory solution. In Part III we argue that expanded (albeit limited) intervention in startup acquisitions is likely to be beneficial, and that the traditional error cost argument holds little weight in such cases. We also discuss reasonable indicia for the likelihood of harm and potential remedies that might be implemented in practice. We conclude by noting that the error cost argument for nonintervention may be inappropriately applied in many other settings as well.

I. ERROR COSTS AND MARKET ENTRY

The complexities of antitrust are often difficult for courts to manage in practice, and it is important for antitrust policy to be mindful of these administrative limitations. Further, the effects [\*335] of an antitrust judgment are often felt by many parties not before the court, including most or all consumers in the relevant market. Thus, a natural question is what costs arise from different types of judicial errors and how they compare. Beginning in the late twentieth century, many scholars set upon this question of "error costs" in antitrust, leading to a widespread view that it is far less harmful to condone an anticompetitive practice than to condemn an efficient one.

The argument's driving premise is that false negatives will generally self-correct over time, while false positives will not. The most commonly given justification for this is that anticompetitive behavior invites new competition, attracted by the prospect of dethroning a high-priced incumbent. After all, higher prices are the easiest to undercut while still turning a profit. Entry is thus more enticing when the relevant market is less competitive, all else being equal.

This argument is complemented by the theory of market "contestability," introduced by Professor William Baumol in the 1980s. This theory describes markets that are concentrated but nevertheless competitive because the prospect of entry deters incumbents from setting supra competitive prices. Such a market [\*336] is said to be "contestable." This theory, when applicable, suggests that market concentration does not necessarily preclude competitive behavior. While arguments about contestability are typically not focused on error costs specifically, they give some theoretical support to the proposition that markets will end up correcting anticompetitive behavior over time, which is the core premise behind the traditional error cost argument.

A. Strategic Behavior and Entry

Arguments about market power and contestability have advanced greatly among economists since the price-theoretic intellectual origins of the Chicago School. In a price-theoretic world, conduct is a function of demand, cost, and technology. Firms are ex ante identical in the technology they can access and can freely enter markets. Excess profits therefore attract entry. Regulatory error that improperly permits anticompetitive behavior by a firm will lead to excess profits, hence pressure to enter. The welfare harms of error, it is argued, are thus less than they appear.

The problem with this argument is that it abstracts away from strategic interactions among the incumbent and the entrant. If a new firm is considering entry, the incumbent may [\*337] have effective deterrence strategies. In particular, the incumbent may be able to invest ex ante in ways that limit entry. Further, the actions necessary to deter entry may harmfully distort socially useful incumbent investments, such as research and development (R&D), product variety, or product diffusion. We treat each of these cases in turn.

To deter entry by inducing potential entrants to believe that competition with the monopolist will be unprofitable requires the post-entry deterrence action to be credible. In the traditional Chicago School framework, entrants have access to the same technology, with the same economies of scale as incumbents. If actions or investments pre-entry do not affect the nature of competition post-entry, then strategic interaction is irrelevant: the extent of entry is affected only by static post-entry profits available to the entrant.

However, there are a number of straightforward strategies by which an incumbent can leverage its market power to deter entry. Incurring sunk costs that lower future marginal costs causes the post-entry price to fall, and can therefore make entry unprofitable. Network effects and other switching costs that require coordination across buyers permit short-term monopoly to turn into long-term deterred entry. Empirically, firms do appear [\*338] to react to the threat of entry in a different manner than they do to realized entry. For instance, when Southwest begins flying from A to B when they are already flying from B to C, the probability they begin flying to A to C thereafter increases as there are economies of scope across routes. The mere threat of those flights induces competitors to drop prices on A to C. When Southwest has already committed to fly from A to C, there is no such preemptive price cutting. Similar entry-deterring actions have been shown in excess advertising of soon-to-expire pharmaceuticals, and in new procedures among potentially competing hospitals. That is, a model in which firms can never credibly deter entry, and hence one in which regulatory error leading to excess profits necessarily attracts entry, reflects neither modern economic theory nor recent empirical results.

Indeed, welfare is harmed not only when entry is successfully deterred, but also from the inefficiencies that arise as firms attempt to deter entry. Efficient markets are not only about price, but also about the amount of innovation, the extent of variety available to consumers, the compatibility of products in a network setting, and the avoidance of "money burning" through zero-sum advertising.

For instance, consolidation in radio permitted by the Telecommunications Act of 1996 led new station entry to fall. Why were entrants not attracted by the more profitable consolidated entry? Newly merged incumbents modestly differentiated their [\*339] station offerings in such a way that, despite consolidation, there were no profitable "holes" in the variety spectrum worth incurring the fixed cost of setting up a station. The particular station variety was chosen for entry deterrence reasons rather than efficiency concerns. Attempts to deter not only reduce welfare by successfully deterring competition, but further harm welfare by pushing incumbents away from the most efficient product variety mix. As we discuss in the following Part, similar dual long-run harms of market power--less entry with its consequent higher prices, and distortions along other margins used by the incumbent to prevent entry--occur in highly innovative industries.

II. STARTUP ACQUISITIONS AND ANTITRUST POLICY

In this Part we consider the potential justifications for limited antitrust intervention in startup acquisitions. Throughout our analysis, we focus on cases where the acquiring firm is highly dominant within a relevant product market, meaning that it has significant market power.

A. Potential Harms

Antitrust usually focuses on potential injuries to competition. Such considerations are certainly relevant in the present context, too, but they do not tell the full story. Startups are typically innovative enterprises, and potential acquisitions may thus play an important role in the innovation and entrepreneurship processes. We address both sets of considerations below. The next Section then discusses empirical findings that shed light on these potential harms.

1. Diminished competition.

An important question in antitrust treatment of mergers and acquisitions is whether the proposed combination is "horizontal" or "vertical." The two types of mergers receive different treatment [\*340] because they involve different theories of harm and different potential justifications. In the horizontal case, the startup is a new or potential competitor of the acquiring incumbent. In this case, the potential antitrust concerns are more salient, for the acquisition necessarily forestalls competitive entry. Indeed, the acquirer may have no interest in actually using the startup's technology; it may simply wish to prevent such technology from reaching the marketplace.

For example, in Federal Trade Commission v Mallinckrodt ARD, Inc, the defendant was initially a monopolist in the market for adrenocorticotropic hormone drugs used for the treatment of infantile spasms. It outbid potential rivals to acquire the domestic rights to the lone competing product, named Acthar, which had not previously been marketed in the United States. The Federal Trade Commission (FTC) brought suit and succeeded in securing a stipulated judgment in which the defendant would be required to license the rights to sell Acthar to a competing US manufacturer, in addition to paying a $ 100 million fine.

However, Mallinckrodt is a somewhat rare case in which the relevant acquisition target was obviously a prospective direct competitor in a clearly defined market that was otherwise utterly dominated by the acquirer. In practice, matters are rarely this clear-cut. First, in many instances, the startup presently offers only a technology that is complementary to the acquirer's product. [\*341] Although it may be quite plausible that the startup would eventually have entered the acquirer's product market (or vice versa) but for the acquisition, this may be impossible to prove as of the acquisition date. Second, the startup's technology may be complementary in some respects but substitutable in others, making it hard to say whether it should be regarded as a competitor. This challenge is particularly salient in high tech sectors, where it is often difficult to define markets.

For these reasons, many startup acquisitions will be presumptively vertical in the sense that they are not provably horizontal. However, in such cases there may still be a material risk of anticompetitive harm if the acquisition prevents the acquirer's rivals from obtaining access to a promising new technology developed by the startup. That is, if the acquirer is dominant in its product market, then its motivation for the acquisition may be (in whole or in part) to exclude its smaller rivals from gaining access to the startup technology. This prevents rivals from improving their own products, thereby extending the acquirer's market advantage relative to a scenario in which several or all incumbents obtain the rights to the startup technology.

Consider a simple example. Suppose there is a dominant leader in the market for smartphones and that the startup technology is an improved processor for mobile devices. The leader maintains an advantage due to the fact that its smartphone is technologically superior in some respects, and/or because it has lower production costs. We can think of either possibility as an advantage in terms of quality. Any smartphone producer can improve its product quality by utilizing the new processor; all else [\*342] being unchanged, this quality improvement would increase demand for this producer's smartphone. Suppose that, before the startup emerges, the leader is using a processor that is at least as good as that used by the laggards (which would at least partially explain why this firm is the leader to begin with). Then, if the leader and laggards all obtain access to the new processor, the rivals will partially catch up to the leader: their own smartphones improve in quality by incrementally more. By leaving the firms on more equal footing, this would make the market more competitive and less concentrated.

By contrast, if the dominant smartphone producer obtains exclusive rights to the startup and then declines to license the processor technology (or to sell the processors wholesale) to its smaller rivals, then it will increase its market dominance. Its own quality level improves, but its rivals' do not. This leaves the market less competitive. Rivals' smartphones now look comparatively worse to consumers, leading these firms to apply less competitive pressure and hence permitting the dominant firm to behave more like a pure monopolist. The result is that static consumer surplus is lower (perhaps significantly so) than if the acquirer's rivals had also obtained access to the startup technology.

As in the pure horizontal case, the acquisition may serve no purpose other than to forestall an increase in competition. That is, the acquirer itself may derive little or no value from using the startup technology itself, perhaps because it is already using a comparable (or superior) alternative technology. However, smaller rivals may still benefit from using it, and the acquirer may purchase the exclusive rights to prevent them from obtaining access to it. In this case, there is no static welfare improvement from the acquisition, since the startup technology is simply not used. Consumers are thus worse off than they would have been if [\*343] rivals had been able to utilize the new processor. First, the market is less competitive than it would have been, and hence output is lower. Second, consumers get comparatively less value (net of price) from rivals' smartphones, as the rivals have been denied access to the improved processor.

Of course, if the dominant firm's rivals would benefit from the startup technology, then they are willing to pay the startup for the right to use it. So how do we know that the dominant firm is willing to outbid them and thereby obtain exclusive rights? The most likely explanation is that it is generally more profitable in the aggregate to soften competition than to invigorate it. By extension, it is more profitable to preserve or increase the dominant firm's market power than to enable smaller rivals to catch up. The result is that a dominant firm is generally willing to pay more to exclude rivals than such rivals would pay to gain ground on the dominant firm.

2. Innovation incentives.

The concern about competition, therefore, is that startups will sell their technology to industry leaders rather than to lagging incumbents even when the sale to laggards benefits consumers by increasing the competitiveness of the product market. A traditional error cost argument does not sit well here: the anticompetitive action is one that simultaneously limits the emergence of innovative new firms.

There are further harms beyond reduced competition. Consider the decision problem of an innovator (a prospective startup, for instance) in deciding what kind of new technology to invest in. Some technologies improve the quality of all incumbents' products, such as flexible or unbreakable smartphone glass. Others merely reduce the technological gap between leaders and laggards, like giving smartphone manufacturers an alternative to an [\*344] otherwise patented technology held by the market leader. Both types of invention improve consumer welfare: the former from directly improving the quality of all products, and the latter from inducing more competitive pricing behavior by reducing vertical differentiation.

Nonetheless, the startup who can license freely is always biased against producing inventions that only help the laggards catch up. The purchase price or licensing fee charged by the startup depends on how the use of such invention would influence competition and industry profits, since these things determine an incumbent's willingness to pay to use a new technology. Inventions that improve all firms' technologies, when bought exclusively by the industry leader, directly benefit consumers while also increasing differentiation between the leader and laggard. The second effect can be strong enough that industry joint profits are highest when only the leader possesses the new technology. However, an invention that only helps the laggard catch up increases competition without directly pushing the quality frontier forward. The industry leader may buy this technology solely to prevent this greater competition, but the purchase price will be lower than that of inventions that also increase the leader's product quality.

Unrestricted startup acquisition, therefore, both makes it harder to compete against strong incumbents and distorts the direction of invention. Things get worse dynamically. As the market leader ingests startups and startups shift their research effort toward technology that helps the leader pull away from its competitors, lagging incumbents will exit. As the number of competing firms falls, the purchase price for startups also falls: The threat to sell to a firm's competitor improves the startup's bargaining power, and such bargaining power diminishes as there are fewer competitors. This fall in purchase price therefore decreases the [\*345] incentive of startups to innovate, directly reducing productivity growth.

B. Recent Empirical Research

Numerous recent articles cast light on the potential adverse effects that may result from a laissez-faire policy toward startup acquisitions. The antitrust concerns are perhaps most salient when an acquisition is motivated purely by the desire to forestall new competition. To that end, one recent paper finds that, in the pharmaceutical industry, numerous innovative new firms are effectively terminated through "killer acquisitions" by incumbent firms. In these acquisitions, the acquirer does not utilize or further develop the target's innovation, but instead merely prevents such innovation from entering into competition with the incumbent's own product.

Although a startup is typically small, the economic effects of startup acquisitions may accumulate over time. To that end, another study finds that, following a statutory amendment that weakened the reporting requirements for prospective mergers, there was an increase in "anticompetitive deals whose individual size enables them to escape regulatory scrutiny but whose cumulative effect is large." Indeed, between 1994 and 2011, "submarine" acquisitions of firms below the Hart-Scott-Rodino Act reporting limit cumulatively consolidated $407 billion in annual US output, equivalent to a 30 percent increase in four firm industry concentration.

[\*346] One important concern is that dominant incumbents will acquire promising new technologies and then decline to license the relevant technologies to smaller rivals. Such a pattern would act to strengthen the market power of the dominant acquirer over time as its technological advantage grows. In this vein, several recent studies find that there is a widening gap between market leaders and laggards. Additionally, a number of articles have purported to find evidence that markets are generally growing more concentrated over time, although this result has not been causally linked to acquisitions or any other specific practices.

The preceding studies bear principally on potential harms to price competition, taking firms' technologies as given. But one may also be concerned about the potential impact of acquisitions on innovative activity, particularly in cases where the startup is an innovative enterprise. One recent study, relying on data from the pharmaceutical industry, finds that mergers generally lead to diminished R&D activity by both the merged firm and incumbent rivals. An additional study finds that incumbents may rely on acquisitions of innovative startups as a substitute for conducting R&D internally. Another study finds that, while innovative new [\*347] entrants have historically played an important role in market productivity and growth, this trend has started to diminish.

C. Limitations of Contemporary Merger Enforcement

The current state of antitrust merger enforcement makes it very difficult to bring a viable challenge against a startup acquisition, even if the acquirer is highly dominant. Here we briefly discuss some of the principal reasons for this. First, merger enforcement usually relies chiefly on estimates of the price effects that would result immediately following a merger. Put differently, merger analysis is static, generally declining to form predictions about how today's transaction will affect competition tomorrow. Static price effects are estimated using established data on firm characteristics and behavior, such as market shares and pricing activity. But a startup is a new player that usually does not presently have a significant market share. Thus, a static analysis will typically suggest that there is no potential harm, but this may only be because the relevant anticompetitive threat involves diminished future competition.

Relatedly, evaluating potential effects on future competition is necessarily more speculative than the analysis of mergers between established firms, where one can reasonably focus on static effects. This makes it much harder (if not impossible) to rely on rigorous empirical methods to estimate anticompetitive effects. Antitrust facially recognizes the elimination of "potential competition" as a basis for intervention, but in practice this kind of [\*348] claim is quite difficult to bring successfully and is rarely attempted. (The Mallinckrodt case was a rare exception. )

Second, as noted above, many acquisitions will not be provably horizontal, even if it is quite plausible that the startup would have gone on to enter the acquirer's product market (or vice versa). In that case, an antitrust plaintiff must attack the acquisition as a vertical merger. However, antitrust has grown increasingly hostile toward vertical merger challenges, leaving very little chance of success even if both parties to the merger are large, established incumbents. Combining this with the general dearth of useful data in startup acquisition cases, it is hard to see a viable path to enforcement without some departure from current judicial treatment of vertical mergers.

In sum, current enforcement policy demands more precise economic evidence than can typically be supplied in cases involving startup acquisitions. While there is good reason to believe that persistent acquisitions by dominant incumbents may produce harmful effects in the aggregate, it is often difficult to establish this in any individual case under the existing standards of merger review.

III. ADMINISTRATION UNDER UNCERTAINTY

The traditional error cost argument implicitly treats the prospect of competitive entry as an external, immutable force that persists independently of a defendant's conduct. But, at minimum, this characterization is inapt when the relevant conduct involves persistent acquisitions of newly formed firms with promising new [\*349] technologies. Innovative new entrants will not challenge dominant incumbents--or aid smaller rivals in doing so--if they can always reap larger profits by simply being acquired by market leaders. Thus, nonintervention in startup acquisitions cannot be justified by allusions to the prospect of competitive entry. On the contrary, the more importance one places on entry as a mechanism by which markets self-correct, the more uneasy one should feel about a pattern in which dominant incumbents regularly acquire the most promising startups that come along.

It is instructive to consider Professor Joseph Schumpeter's well-known discussion of "creative destruction," the dynamic process by which new technologies and new rivals persistently upturn the status quo over time. Schumpeter states that

[e]conomists are at long last emerging from the stage in which price competition was all they saw. As soon as quality competition and sales effort are admitted into the sacred precincts of theory, the price variable is ousted from its dominant position. . . . [I]n capitalist reality as distinguished from its textbook picture, it is not [price] competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the largest-scale unit of control for instance)--competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.

Schumpeter thus emphasized the prospect of new competition and innovation as playing a key role in fostering economic efficiency over time. In the same spirit as those who believe antitrust should persistently err on the side of nonintervention, he argued that an apparent deficiency in static competition does not imply that the market will perform poorly over the long run. But, as he stressed, this requires that a leading incumbent view the prospect of innovative new firms as an existential threat--not a transactional opportunity with which to extend its lead over [\*350] smaller rivals. However, we have little reason to expect this if such acquisitions are virtually never subjected to meaningful antitrust scrutiny.

As emphasized in the last Section, a serious challenge is that startup acquisitions present significant uncertainties and are therefore less amenable to empirical forecasting than conventional mergers. This means that hypothetical intervention would have to be predicated on less precise economic evidence than courts usually demand, creating some risk of false positives. But that does not mean that such a policy could not improve upon on the status quo.

Importantly, the uncertainties cut in both directions. The current policy, which permits virtually all startup acquisitions by dominant incumbents, is also making errors: some portion of these transactions will inevitably lead to a but-for reduction in future competition, even if this result was not rigorously quantifiable ex ante. As such, it would be naïve to suggest that antitrust is currently avoiding errors simply because almost none of the relevant acquisitions are expressly litigated. If anything, this merely signals that current antitrust standards are too onerous to be administered in practice. This reflects a failure to acknowledge the distinct economic and practical difficulties that distinguish startup acquisitions from more conventional mergers between established incumbents. Current policy simultaneously (a) makes no effort to confront the uncertainties in a practicable way, and (b) gives no weight to the broader incentive problems that may arise if leading incumbents can rely on persistent acquisitions to modulate the future course of competition.

Realistically, any antitrust policy toward startup acquisitions (including one of inaction) is bound to make errors in some percentage of cases. But, as we have argued above, in this context there is no good reason to maintain the traditional view that false positives are more problematic than false negatives. A better approach is to acknowledge that this area involves unavoidable uncertainties, but also significant potential harms, and to develop [\*351] standards that strike a reasonable balance between administrability and the risk of judicial error. Consistent with this, the courts have occasionally cautioned that antitrust standards ought not to demand such a degree of economic precision that they become impracticable. For instance, in Barry Wright Corp v ITT Grinnell Corp, the court noted that "[r]ules that seek to embody every economic complexity and qualification may well, through the vagaries of administration, prove counter-productive, undercutting the very economic ends they seek to serve."

#### The structure of market dictates the ability to innovate.

Mark A. Lemley & Andrew McCreary 21, William H. Neukom Professor of Law, Stanford Law School. Partner, Durie Tangri LLP; J.D./M.B.A., Stanford Law School and Stanford Graduate School of Business, "Exit Strategy," Boston University Law Review, Vol. 101, Issue 1, January 2021, Lexis.

While these may be valid points in particular cases, they neither disprove nor help solve the problems of concentration caused by the norm of selling startups to incumbents.

First, market structure matters. Markets that are not competitive not only distort prices but also reduce innovation. Further, incumbent acquisitions prevent potential competitors from combining to form a company that can credibly threaten entry at scale. So reducing the possibility of Schumpeterian competition is likely to discourage innovation in the long run. And precisely because incumbency does bring some real advantages, we may need to create incentives to support Schumpeterian competition and avoid perpetual incumbency.

[\*68] And second, in any event, the incumbent will put the innovation in the hands of more consumers only if it actually deploys that product. As we have seen, incumbents often buy startups and then kill them, either deliberately or by dissipating the team and not focusing on the acquired product. Incumbents have less incentive to deploy new technologies than startups do. That's because incumbents that replace their existing product with a new one are mostly stealing customers from themselves. And incumbents don't need to innovate to stay alive if they can buy any entrant that looks like a threat.

Finally, the value of scale is similarly not a persuasive reason for most incumbent mergers. There may be markets where network effects are so strong that merger is inevitable. But we should be reluctant to assume that just because scale has value, the incumbent will always make a better product. History is full of cases where that turned out not to be true. Sometimes it just means we need a new dominant firm. And we won't see those leapfrog products if the incumbent buys the potential disruptor. Even in the relatively rare case of technologies that can reach their full potential only when deployed to the entire market, there are alternatives to allowing incumbents to buy up all new technologies. We could, for example, require that certain AI training databases be open to all AIs or that companies allow access by competitors seeking to make their products interoperable with the de facto standard.

#### 2. Regional inequality---tech monopolies create clusters that result in disparate financial outcomes.

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1. Introduction

Digital start-ups are often seen as a promising vehicle for local economic development, yet as they become established many are pulled away to relocate in major tech clusters. This locational choice is often treated as being explained by agglomeration economies which boost the productivity of tech workers (Duranton and Puga 2004; Nathan 2015; Adler et al. 2019; Gazel and Schwienbacher 2020); others have pointed, additionally, to proximity to venture capital financing (Kenney 2011; Florida and Mellander 2016). It contributes to the growing gulf between prosperous tech clusters and “left behind” places – a gulf seen in incomes, housing prices, age profiles, education levels and voting behavior – which has become central to our understanding of social and political polarization (Rodriguez-Pose 2018; Iammarino, RodríguezPose, and Storper 2019; Rodríguez-Pose and Storper 2020).

We argue that one important factor in many digital start-ups’ choice to locate in major tech hubs – and the Silicon Valley in particular – is that proximity to the largest digital firms makes it more likely that the start-up will be acquired by one of the latter. We study acquisitions by the seven largest American digital platforms – Amazon, Alphabet [Google], Apple, Microsoft, Facebook, Oracle and Adobe (we refer to these collectively as Big Tech). As others have shown (see e.g. Rikap and Lundvall 2020), acquisition of smaller companies is, for Big Tech, a major source of new technologies, ideas and talent. The ability of Big Tech to exploit the monopoly power conferred by positions in control of critical digital platforms has given these companies extraordinary financial resources; continuing acquisition of start-ups and, with them, new features and capabilities, both makes use of these financial resources, and extends and cements Big Tech’s control of its markets.

The other side of the acquisition market – being acquired – is a critical part of the business model of digital start-ups. This is due to the scale economies – low marginal costs and network properties – of many digital products. Success – even survival – in markets for these products requires rapid scaling in order to secure a decisive, often winner-take-all, first mover advantage. Growth therefore requires substantial infusions of equity investment, which typically comes in two distinct stages. In the first, an investor such as a venture capitalist or business angel will take a large, often controlling, interest in the firm. In the second, part or all of the first-round stakes will be sold, either through a stock market flotation (initial public offering, or IPO), or through acquisition by another firm. Either of these routes can represent financial success for a start-up, but acquisition is far more common. Since many start-ups fail to reach the second round of financing, making it happen is an important business objective.

In an earlier paper, we argued that the divide between wealthy and poor places is deepened by monopoly power, and in particular by the power of the large digital platform companies (Feldman, Guy, and Iammarino 2020). Among the reasons we gave for this is that the power of these companies amplifies the centripetal pull of agglomeration economies. It does so for two reasons. One is that the productivity of labor is augmented by monopoly rents, some portion of which is shared in the form of high remuneration for a stratum of skilled workers. The other is that, for smaller digital firms, part of the attraction of major tech hubs is the market for acquisitions: proximity makes it more likely that a particular start-up will be chosen as the latest augmentation of a major digital platform, with the result that some sliver of the platform’s rents will be shared among the owners and key employees of the startup. In this paper, we develop the second of these claims, about the market for acquisitions.

Why does it matter if the productivity-enhancing characteristics of a tech cluster – the familiar Marshallian properties – are being amplified by monopoly power? Simply, because the welfare implications of the two sources of agglomeration are different. If an agglomeration grows large and wealthy purely for Marshallian productivity reasons, then any efforts to redistribute benefits from that agglomeration to places left behind, must face the question of whether a spatially-targeted economic development policy may kill the goose that is laying golden eggs. But if the agglomeration has grown still larger and wealthier due to the monopoly power of firms based there, then familiar remedies such as anti-trust enforcement and regulation may mitigate both the problems typically associated with monopoly, and regional disparities in income and opportunity.

In this paper, we develop evidence for the market for the acquisition of start-ups. Section 2 places our main arguments in the literature. Section 3 provides data sources and descriptive evidence on the acquisitions. Section 4 describes our reference groups of companies in the same sectors. Section 5 presents regression analysis that supports the finding from the US descriptive statistics. Section 6 discusses implications and concludes with future directions for research.

2. Start-ups and the geography of Big Tech acquisitions

Theories of cluster dynamics have often addressed the relationships between large and small firms (e.g. Feldman, Francis, and Bercovitz 2005; Feldman and Lowe 2015). It has been common to see large firms as anchors to a cluster, with smaller firms present to serve them, typically as suppliers, and with large firms connecting the cluster to distant markets and sources of knowledge. Such have variously been labelled hub-and-spoke cluster, solar cluster, or industrial complex serving the needs of larger client firms (Markusen 1996; Piore and Sabel 1984; Gordon and McCann 2000). Small firms may also be clustered close to a large one because the small ones were founded by former employees (Klepper 2011; 2015).

We are interested here in a different spatial dynamic between large and small firms: not a stable set of small suppliers to the large firms, nor small firms founded on exit from large ones, but a marketplace for acquisition of the small firms by the large firms.

Start-ups may be drawn to tech clusters by productivity-enhancing agglomeration economies; by better access to financing for growth (we include being acquired as financing); or a combination of the two. Against these are factors encouraging digital start-ups to locate elsewhere. As Dahl and Sorenson (2012) show, entrepreneurs, even more than workers, prefer to grow their business in a place they already know – in other words, they would rather stay home (see also Florida and Hathaway 2018; Sorenson 2018). The product of the digital start-up seems well suited to this: it is weightless, something that in technical terms can be shipped anywhere in the world as easily as across the street; the infrastructure requirements for operating such a firm are easily satisfied in a developed country – a reliable broadband connection and electric power; state and local governments offer incentives to stay; and, while most places do not have the large pool of talent available in a major tech hub, skills of programming and software engineering are taught universally. Notably, programming skills are taught and researched at a high level in places such as Urbana-Champaign, Illinois, and Ann Arbor, Michigan, and dozens of other rustbelt or southern universities with fine engineering schools. Some of these places figure prominently in the world ranking of start-up hubs (Florida and Hathaway, 2018); yet, as we see below, these places are negligible as home bases for start-ups at the time of acquisition by platform giants.

Digital start-ups1 are likewise producing highly scalable products – sometimes tools or features to augment existing platforms, sometimes platforms on their own (e.g. Ruggieri et al. 2018). The commercial logic of proprietary digital products is that they must be scaled, because a successful first mover will dominate a market segment (Schilling 2002). This winner-take-all market structure means that scaling must occur quickly, depriving digital firms of the option of organic growth from retained earnings: external financing is needed. Moreover, starting up in a winner-take-all market is very risky, so the external financing must be equity financing, from investors with pockets deep enough to sustain some years of losses at best and to lose all at worst. The same technological features which make unregulated proprietary platforms into monopolies thus drive small digital companies to prioritize relations with equity investors. In what we can call the venture capital stage, this investment typically comes in the form of private equity, often from a firm specializing in venture capital; sometimes, it will come from an individual “angel” investor (Kenney 2011; see also Table 4, below). Such equity investors habitually acquire controlling stakes in the company, and usually intend to sell the company at a later stage. Sale may either entail the start-up being floated on the stock market in an initial public offering, or its acquisition by another firm. The IPO route comes with the prospect of wealth and fame for the founders as principals in an independent company; it is, however, by far the less common of the two routes. An acquisition by Big Tech is among the most lucrative outcomes (Dwoskin 2020).

Guzman (2019) considers two competing explanations of US start-ups’ location – agglomeration economies and social embeddedness and concludes that agglomeration economies are far more important than social networks. He finds selection of high-quality start-ups, particularly from lower agglomeration regions, into Silicon Valley, and shows that moving results – among other financial and market benefits – in a higher likelihood of being either acquired and offered an IPO or, in other words, of achieving “extreme” growth (see also Andrews et al. 2020). Guzman is silent on any role the market power of the acquiring firms might have in raising the likelihood of takeover, simply treating the greater likelihood of financing for extreme growth as one of the benefits of agglomeration. We see the same in Kerr and Robert-Nicoud’s (2020) otherwise exhaustive review of the character of tech clusters, and of the frantic attempts of places to brand themselves as “Silicon Something”: consideration of market power is absent.

There is now considerable public scrutiny2 of acquisitions by tech giants. There is also a growing body of research. This literature does not ignore market power, but it does ignore geography, location in space. “Space” needs the qualifier because the literature is full of references to “space”, “cluster” or “zone”, but these refer to “spaces” of products or technologies

The secular growth of market power in the US since 1980 is now widely recognized (De Loecker and Eeckhout 2017; Eggertsson, Robbins, and Wold 2018; Hsieh and Rossi-Hansberg 2019), and has been particularly great in digital sectors (Calligaris, Criscuolo, and Marcolin 2018). It is an era which dawned with the de-regulation of old network industries, and singularly failed to come to terms with the opportunities for market power presented by proprietary digital platforms. The market power of giant technology firms has become, belatedly, a matter of concern for, among others, the US Congress (anti-trust hearings), the government of Australia (clamping down on Google and Facebook’s free-riding on newspapers), the DG Competition of the European Commission (new proposal for the Digital Market Act) and legislators in states like North Dakota (taking aim at Google and Apple’s monopsonies on apps using their respective phone platforms). Meanwhile, a handful of Silicon Valley and Seattle companies operating digital platforms have far and away the highest market valuations of any corporations on Earth.

Platforms connect users as a network. Networks benefit from increasing returns, which creates economies of scale and results in lock-in as a source of their advantage (Kenney and Zysman 2016; Rikap 2020). Our Big Tech companies control particularly large platforms, and often control more than one network (Ducci 2020; Stallkamp and Schotter 2021). For example, Alphabet and Apple both control phone operating systems, which are platforms for apps – most phone apps in the world go through the online “stores” of these two companies; Adobe, Microsoft and Oracle all sell general purpose software which produces user files in proprietary formats, making users dependent on the platform in order to ensure full inter-operability; Alphabet and Facebook dominate online advertising in much of the world; Amazon’s “marketplace” connects hundreds of thousands of vendors with hundreds of millions of customers; Facebook and Microsoft operate social media platforms; and so on.

Digital platform business models serve networks, but they are unlike the relatively static networks of the 19th and 20th centuries. Owners of an electric power grid, once it is in place, have little to fear from competitors; for a digital platform, maintaining market position, and monetizing that position, demand ongoing innovation, refinement of features, addition of services (Hindman 2018). The major platforms have considerable internal research capabilities but, compared with the industrial giants of the previous century – General Electric, IBM, and such – they source more innovation through acquisition (Lazonick 2009; Rikap and Lundvall 2020). And, because of the financial resources which their market power confers, the major platforms are always in a position to acquire.

Gautier and Lamesch (2020) review five tech giants’ (Google, Amazon, Facebook, Amazon and Microsoft, or GAFAM) acquisitions during 2015-17. They find that acquisitions mostly fall in the firms’ core markets segments or product spaces. Similarly, Argentesi, Buccirossi, Calvano, Duso, Marrazzo and Nava (2019), in a study of acquisitions by Amazon, Facebook and Google (AFG) in the decade 2008-2018, conclude that acquired products and services are largely complementary to those already supplied by the three companies. This is supported by Lopez Giron and Vialle (2017) in their study of Microsoft’s acquisitions in the period 1992-2016, focussing on acquired resources and competences: the largest share of acquisitions complements (rather than diversifies) Microsoft’s core businesses. Gautier and Lamesch (2020) find that most of the acquired products are discontinued post-acquisition, implying that the acquisitions are largely motivated to gain intangible assets such as intellectual property rights and talent.

This pattern of acquisitions has implications for innovation. Bryan and Hovenkamp (2020) find that start-ups which aim to be acquired are biased toward inventions that improve the leader’s technology, rather than offering an alternative to it.

Tech giants may acquire companies to suppress competition. This is well documented in other information-based sectors, such as pharma and microprocessors (Feldman et al. 2020). Cunningham, Ma and Ederer (2021), for instance estimate (conservatively, they say) that between 5.3% and 7.4% of US acquisitions between 1989 and 2010 were “acquire to kill”, and thus harmful for both innovation and competition.

Moreover, even without any deliberate suppression of a competing product, a tech giant’s acquisition or development of a product tends to create a “kill zone”, in which competing projects struggle to get both users and capital (Kamepalli, Rajan, and Zingales 2020). Rival startups offering substitutes for an acquired product find themselves starved of both capital and customers; notice that this describes a winner-take-all market, in which the winner is the first to be acquired by a tech giant. Wen and Zhu (2019) find that when Google appears likely to develop a new app or capability for Android internally, its smaller competitors reduce innovation and raise prices.

Argentesi et al. (2019), Bryan and Hovenkamp (2020), and Kamepalli, Rajan and Zingales (2020), Motta and Peitz (2020), Katz (2020) and Cabral (2020) all draw conclusions about implications for competition and innovation policies. Abstracting from the considerable differences in methods and disciplines there are common themes. One is the deleterious effect platform acquisitions can have on innovation. Another is the fact that the vast majority of acquisitions by platform-based tech giants evades investigation, often because the turnover of the acquired digital start-ups falls below the threshold required to trigger government intervention. The consensus is that legal restraints on merger activity are not doing the job, and that tightening these restrictions could improve both innovation and competition. Kamepalli, Rajan and Zingales (2020) stress, however, that more effective measures would be ones which directly attack the exclusivity of platforms: open standards; controls on data ownership; and – for countries outside the US – restrictions on global, US-based platforms to make room for national alternatives (policies in China and India are offered as examples here).

Acquisition is usually a financially desirable outcome for the shareholders of a small firm; for firms in the winner-take-all digital platform economy, it may be the only route to survival. The home bases of the platform giants are geographically concentrated: the seven Big Tech we study are located in just two metropolitan areas, San Francisco-San Jose (the Silicon Valley), and Seattle. If physical proximity to the acquirer makes a successful acquisition more likely, this provides a motivation for start-ups to move to a major tech hub, and to the Silicon Valley in particular. This centripetal pull of the tech clusters for precisely those start-ups which have the greatest growth potential, can impose a low glass ceiling on local economic development initiatives based on developing digital technologies: the product may be weightless, but the market for the company is elsewhere.

3. Data and descriptive analysis

Our empirical investigation relies on all acquisitions made in the US by the seven largest digital platforms in terms of market capitalization3 : Alphabet (Google), Adobe, Apple, Facebook, and Oracle headquartered in Silicon Valley, Amazon and Microsoft located in Seattle, from their inception to the current time.4 In choosing these firms we are excluding a number of neighboring categories: non-US platforms (China has at least two that would qualify on the basis of market valuation, Alibaba and Tencent Holdings); payment platforms (had we included American payment platforms with market valuations in the neighborhood of the companies that we did include, it would have changed the geographical picture little, with two in the Silicon Valley (Visa and PayPal), and one in New York (Mastercard)); hardware (the standards of Intel or Nvidia can be regarded as platforms); telecommunications (mobile phone networks); and entertainment (Netflix, for instance, is a digital platform).

Each of our seven firms began as an entrepreneurial start-up. Most received venture capital financing (Oracle leveraged federal procurement contracts), grew rapidly, and went public. The phenomenal growth of these firms, together with that of hundreds of smaller digital platform companies, contributed to the belief that “tech”, specifically, digital technology, offers an attractive building block for local economic development.

Table 1 provides an accounting of acquisitions, by acquiring company, from their earliest acquisition through 2020. We include all full (100%) acquisitions made by Big Tech and their subsidiaries. Data are drawn from three databases, Zephyr-Bureau van Dijk, Capital IQ-S&P and SDC Platinum-Refinitiv, and then cross-checked and verified through manual searches. Acquisitions which cannot be verified through either mention on the company website or news articles are not included in our sample on the assumption that these are likely “acqui-hires” with no substantial start-up company involved. The Appendix details the laborious procedure used to construct this list, and shows statistics for the various data sources.

In total, the seven Big Tech acquired 940 firms worldwide, with 674 acquisitions based in the US. Notably, all of the tech giant firms started acquiring of other firms in the years following their own IPO. Alphabet completed the largest number of acquisitions to date (237), closely followed by Microsoft (235). Acquisitions occur consistently over time, with the annual average number of acquisitions ranging from 12 a year for Alphabet, to two for Adobe.

[Table omitted]

For all of the Big Tech, the majority of acquisitions were sourced from the United States; 266 (28%) were acquisitions of firms based outside the US (Table 2). The largest number of acquisitions are from the UK (50), Canada (42) and Israel (32). Acquisitions within countries are also geographically concentrated. This pattern broadly reflects the distribution of major high tech clusters, and their linguistic and political affinities with the United States, identified in Arora and Gambardella (2005). However, out of all of Asia and the developing world the only country with more than two of the takeover targets was India (6) while China, Japan and Korea – all major locations for digital technology – are under-represented.

[Table omitted]

Caution is required in comparing countries. “Acquiring a company” does not mean the same thing everywhere; in some countries it comes with much greater obligations to employees and other stakeholders, than it does in others (Hall and Soskice 2001). The tax implications may also differ. The Big Tech acquisitions are largely about acquiring skilled employees and intangible assets, rather than operations and physical assets. Hiring the employees, or purchasing the intangible assets, can be alternatives to acquiring the firm as a whole, and differences in national institutions may weigh in the choice.

This caution does not, however, hinder within-country comparisons. In most countries for which the numbers are large enough to generalize, we see an overwhelming concentration in the country’s financial capital – London, Tel Aviv, Paris, Stockholm, Dublin; however, in Canada and Germany – both federal, polycentric states – the pattern is more geographically dispersed.

We limit our further analysis to the acquisition targets with known locations in the United States for the two decades 2001-2020.5 Table 3 gives a breakdown of the Big Tech acquisitions by metropolitan statistical areas (MSAs) and the percentage that received venture capital investment. Investor (vendor, to Zephyr) data are from Zephyr and includes the majority owners at the time of acquisition, which are similar to the ownership information that would be provided in an IPO prospectus: reliable data are only available after 2001. While VC is the largest source of financing, businesses’ founders, angel investors and other entities such as banks, and wealth and investment management firms were mentioned. There was only one public-private equity investment from the New York City Investment Fund LLC, now known as Partnership Fund for NYC. Individual investors include founders and angel investors. Two universities were listed: Stanford (in the Silicon Valley) and the University of Washington (in Seattle).

Of the 603 US acquisitions about half of them received venture capital investment. For non-US acquisitions only one quarter received venture capital investment. Note the extreme concentration in the Silicon Valley, which we define as the combined San Jose-Sunnyvale-Santa Clara and San Francisco-Oakland-Berkeley MSAs. The largest number of firms (291 or almost half of the US Big Tech acquisitions) were located in Silicon Valley at the time of acquisition, with 54% of the companies receiving VC investment. Four other MSAs form a distinct second tier for acquisitions: New York, the financial capital of the US; Boston and Los Angeles, both of which are important centers of both technology and private equity finance; and Seattle, the home of Microsoft and Amazon. In all, there were 18 cities with two to five acquisitions. There were 25 MSA’s with one acquisition each and one third of these companies received VC investment. Overall, 49% of the acquired companies received VC investment: the percentage is slightly higher, among the main hubs, in Silicon Valley, New York and Boston.

[Table omitted]

We compare the spatial distribution of Big Tech acquisition targets to the distribution of four different sets of firms seeking finance in relevant industries.

Three-quarters of the seven Big Tech acquisitions are attribute to three SIC codes: 7371 – computer programming services, 7372 – prepacked software, and 7374 – computer processing and data preparation and processing services. The remainder of the acquisitions were dispersed across many sectors. Our four comparison groups are limited to these three SICs, using the sources and definitions described in Table 4.

[Table omitted]

The broadest of the four comparison samples consists of 6,213 firms in the three SIC codes that received Small Business Administration (SBA) 7(a) loan guarantees. This is a government guaranteed loan that is made to firms who are seeking investment funding and have demonstrated their credit worthiness. A narrower sample consists of the 3,005 firms listed in the Zephyr database as having been fully acquired, but with a purchaser other than one of our seven Big Tech (All Other Acquisitions). The narrowest sample consists of the 196 firms which had Nasdaq IPOs, Nasdaq being the leading exchange for tech company stocks (IPOs). Finally, we also compare with a subset of the All Other Acquisitions sample: 1,030 firms sold by VC firms which also sold firms to Big Tech. Just as the map of international Big Tech acquisitions is not the global map of digital technology, neither is the US acquisitions map the same as the map of the sectors involved.

[Table omitted]

Table 5 examines the geographic distribution of the comparison data sets. Silicon Valley has the highest count of firms for all the categories except SBA loans, which has a larger geographic reach. Firms that receive SBA loans have the human capital and organizational capabilities required to establish start-ups in these industries and are widely geographically distributed. Indeed, the counts of firms applying for SBA loans encompass a much larger set of cities and suggests that public financing may be an alternative substitute when VC funding is not available. New York City, the largest metropolitan area is more heavily represented by SBA loans.

[Table omitted]

The maps in Figure 1 show the distribution of the first three comparison groups, and their number relative to Big Tech acquisition targets. The size of circles indicates the number of firms in the comparison group, while the shading indicates the number of Big Tech acquisitions relative to that. Circles in the darkest shade of red indicate that there were a larger number of Big Tech acquisitions in that place than companies in the comparison group. Empty (white) circles indicate an MSA with cases from the relevant comparison group but no Big Tech targets.

[Figure omitted]

The top panel shows the distribution of firms from the selected tech industries that received SBA 7(a) loans. Most large cities had a substantial number of SBA loan recipients but small places also have firms that received these loans. This does not mean that the latter are evenly geographically distributed: cities known to be tech hubs had a larger share, as we would expect. In most MSAs, the number of Big Tech acquisitions is less than 25% of the number of firms receiving SBA loans. The number exceeds this level only in a few small cities that are secondary tech hubs (the most substantial being Boulder, Colorado), and the Silicon Valley, where the number of Big Tech acquisitions exceeds the number of SBA loans.

The comparison group for the second map is all other acquisitions of firms in relevant industries. An acquisition is a relatively rare event, so there are overall fewer circles than in the SBA case. Compared with SBA loans, acquisitions are more concentrated on the West Coast and in the Northeast; still, they remain far more widely distributed than Big Tech acquisitions. Of large cities, the ones with the higher ratios of Big Tech acquisitions to other acquisitions are all on the West Coast: Seattle, Silicon Valley, Los Angeles, San Diego.

The third map compares Nasdaq IPOs. In most locations that have IPOs, there are only a few, and the number of Big Tech acquisitions is at a comparable, or even higher level.

Finally, we compare the growth in geographical concentration of Big Tech Acquisition to that observed in the four comparison samples, using the share of targets located in Silicon Valley and the Herfindahl-Hirschman index by MSA (Figure 2). The extent and increase in concentration of tech giants’ targets is striking. In the first period, other businesses sold by investors that sold to Big Tech were actually more concentrated on both measures. However, this changed by 2011-2020, where almost 30% of Big Tech US-based targets were located in the Silicon Valley, compared to less than 10% of all acquisition targets in the relevant industries.

[Figure omitted]

4. Differential Outcomes: Probit Analysis

We estimate probit models to provide additional descriptive analysis. Table 6 presents definitions for the variables we use in our regression along with summary statistics.

[Table omitted]

How are the odds of being acquired by a Big Tech affected by the location of the acquired firm? If being acquired is an objective for a start-up and if location affects the likelihood of being acquired, this would be a factor in drawing such firms to certain locations, above and beyond any productivity advantages. Moreover, the digital tech sector is not homogeneous; an acquisition is the outcome of a matching process. Some start-ups have products, intangible assets or personnel that offer better potential matches than others for our tech giant firms, and for that reason would be more likely to locate in a place which makes acquisition by one of the Big Tech firms more likely.

The likelihood of being acquired by Big Tech may also be affected by the source of external financing in the first stage, however. Proximity to venture capital, in particular, is often claimed as an advantage to locating in the Silicon Valley (Saxenian 1994; Kenney and Florida 2000; but see Lerner 2009). A variant of this claim stresses the role of certain specialist investors – most but not all of them VCs, and many but not all of them located in the Silicon Valley – which have strong ties to the tech giant companies dating back to the first-round financing of the latter: initial backing from a member of this small group may bring a start-up into the right networks, and improve its chance of being acquired by one of the Big Tech. These early investors in Big Tech are listed in the Appendix (Table A.3); they include such well-known firms as Venrock, Sequoia Capital, and Greylock Partners.

Finally, it is possible, from what we have seen in our description of the data, that Big Tech targets are disproportionately – that is, compared with other acquisitions in the relevant industries – not just from the Silicon Valley, but from major digital tech clusters (e.g. Boston, Seattle, New York, Los Angeles) overall. To check this, and also to control for this agglomeration effect in our estimate of the Silicon Valley effect, we include a variable for the number of SBA loans in the three focal industries and in the MSA in which the target is located.

Any of these same factors – Silicon Valley location, VC funding, the location of the VC, and a backer in the group of initial Big Tech funders, size of digital tech agglomeration – could also affect the likelihood that second stage financing will take the form of IPO rather than acquisition. In the IPO case we do not have strong priors on what these effects would be, but are interested in what the comparison will tell us.

We estimate two sets of probit models. In the first set (Table 7), the data consists of all Big Tech US acquisition targets in the years 2001 to 2020, together with all other acquisition targets in our three focal industries. In the second set (Table 8), the data consists of firms in the focal industries that went to IPO, versus all acquisition targets other than the Big Tech targets. All models include Target in Silicon Valley (binary), SBA Loans (continuous), and a dummy for the year. Other variables, depending on the model, are Investor Venture Capital, Investor in Silicon Valley, and Investor Early Investor in Big Tech (all binary).

We see in Table 7 that a Silicon Valley location for the target has a positive and statistically significant effect; with all covariates included, the marginal effect of a Silicon Valley location is 0.17, which is to say a 17 percentage point increase in the probability of being acquired by a Big Tech. The investor being a venture capitalist actually makes it more likely that the firm will be acquired by a non-Big Tech firm; in contrast to the target’s location, the investor’s location in the Silicon Valley has no discernable effect on whether the acquirer is a Big Tech. On the other hand, the investor being an early backer of one of the Big Tech companies has a positive and statistically significant effect on the likelihood of a Big Tech matchup; with a marginal effect of 0.16, it is essentially the same as the effect of a Silicon Valley location for the target.

SBA loan numbers have a positive and statistically significant effect, indicating that in MSAs with fewer digital tech SMEs the ratio of Big Tech acquisitions to acquisitions by other firms is lower.

[Table omitted]

Table 8 considers the same factors for the IPO outcome. Again, we see a strong positive effect from Silicon Valley location – at 0.19, about the same as for Big Tech acquisitions. If an IPO is the big prize for founders of a start-up – the attraction of growing while staying independent – this suggests one more attraction of the Silicon Valley. Having a venture capitalist for an investor has (again) a negative effect; having an investor located in the Silicon Valley is now significantly negative; having an investor who was one of the early Big Tech backers has a statistically insignificant effect after controlling for other variables. As with Big Tech acquisitions, more SBA loans – which is to say, greater size of the digital tech agglomeration in the MSA where the target is located – raises the likelihood that second round financing will come in the form of an IPO rather than acquisition.

[Table omitted]

5. Conclusion

The conditions which link digital platform monopoly and the pull of start-ups to the major tech hubs, may be summarized as follows. Digital products are scalable; some can be scaled as platforms, which connect users as a network, creating lock in. For the platform giants this has been the basis for monopoly power. The monopoly power of the Big Tech (as for other giants, in other IPR-, network-based industries) is never secure. They are Schumpeterian (Schumpeter 1942), innovating to maintain and extend their market power. However, unlike the manufacturing giants of the twentieth century, much of the platform giants’ innovation is essentially outsourced to start-ups, which the Big Tech may then choose to acquire. The latter compete in a sort of tournament in which being acquired is the prize. The tech giants have vast financial resources, putting them in a position to make an offer for any smaller firm they might find useful.

Many who start new firms might prefer independence, rather than being acquired. Digital start-ups are, however, producing something which is scalable, with very low marginal costs. This puts them in a winner-take-all market, where the first mover into a particular platform function or a new technical standard can have an overwhelming advantage. Start-ups thus require infusions of equity, which we can think of as coming in two phases. It is common, in the first stage, for this to come from investors who expect to sell the company on if its product proves successful. The second stage is either and IPO or acquisition by a larger company. We regard either of these second stage outcomes as infusions of capital for the start-up, though in the acquisition case the start-up may lose its identity altogether. From the standpoint of shareholders in the start-up, completion of the second phase represents success.

For the start-up, there is no certainty in this path to being acquired: even if the start-up’s product (“product” here might be a new platform, but it can also simply be some IPR, or a team’s demonstrated ability to solve a particular kind of problem) is a good one, another start-up may have something similar, or the large firm may develop something internally. Start-ups will therefore be motivated to position themselves ways that improve the likelihood of being acquired.

Is moving to Silicon Valley one of those ways? Although our seven Big Tech do acquire firms throughout the US and in many other countries, some places see far more than their share of acquisitions. Certain foreign countries (Canada, UK, Israel), certain foreign cities (London, Paris, Bangalore, Tel Aviv), certain cities in the US (New York, Boston, Seattle, Los Angeles) and, far above even those, the Silicon Valley itself. Within the US, we are able to compare this with the distribution of all acquisitions, and with the distribution of SBA loans, in the relevant industries. By both measures, Big Tech acquisitions lean far more heavily to the major tech clusters and, again, far far more to the Silicon Valley. Big Tech may be able to source its weightless acquisitions globally, but it tends to make most of its purchases in a few very familiar shopping malls.

To what extent are these acquisitions driven by the market power of Big Tech? Market power gives Big Tech the means, in the form of piles of cash. It also gives Big Tech the motive: just as Schumpeter described, the monopoly is maintained, extended and renewed through innovation – albeit, now, innovation is to a large extent initiated outside the monopoly firms themselves.

Actions on both sides of acquisition transaction – the need for the start-up to scale up, and the means and motive of Big Tech – grow out of the proprietary control of access points to digital networks.

The problem of network monopoly has been faced before. In the late 19th and early 20th centuries, for instance, then-new network industries such as electric power, telephones and railways developed huge power, and were subsequently brought either under public ownership, or public regulation, almost everywhere in the world. The various modes of regulation are beyond the scope of this paper – suffice it to say that in technical terms this is not an unknown problem. In political terms it is perhaps a bigger problem than that faced with the old network industries, because the geography of digital platforms is different. An electric power network or a railway has assets and employees distributed around the limited territory it serves; those who are harmed by the monopoly are in roughly the same place as the monopoly’s assets and employees, which makes the regulation of the monopoly a distributional matter within a welldefined polity. Twentieth century American regulation of public utilities and banks actually enforced this by keeping the companies within state lines.

The geography of a digital platform firm is much different, and that different geography makes for a different politics of regulation. The platform firm typically has assets and employment concentrated in a few locations. For those locations, it is an important export industry – that is precisely why state and local governments seek to foster tech clusters. Big platform firms exercise market power nationally in the United States, and internationally. Within the US, the economic interests of the major tech clusters are in conflict with those of the places left behind; internationally, the maintenance of Big Tech’s monopolies has become a central pillar of US trade policy (Guy 2007; Rodrik 2018).

Should this situation change – following, perhaps, the sorts of measures outlined by Kamepalli et al. (2020) – the consequent decline in the acquisition market should make it more feasible to foster the growth of digital start-ups in what are now left-behind places. It would also remove one factor which drives the seemingly endless growth in size and housing costs in the major technology clusters.

What we have observed here, in the case of seven large digital platform companies, raises a bigger question about the geography of market power and of acquisitions. What goes for digital platforms may, or may not, go for other types of information-based product with extreme increasing returns and wide geographical reach, such as pharma, biotech, and digital media. Moreover, with digital platforms and with others, how much of the acquisition market is held by giant firms, as opposed to merely large? In the first instance, both questions could be addressed through a mapping of takeover relationships – locations, distances – in relevant industries.

#### That decks growth.

Valerie Cerra et al. 21, Assistant Director and Division Chief, European and Middle Eastern Division, IMF’s Institute for Capacity Development. PhD, Economics, University of Washington; Ruy Lama, Senior Economist, IMF. PhD, Economics, University of California at Los Angeles; Norman V. Loayza, Director, Global Indicators Group, Development Economics Vice-Presidency, World Bank. PhD, Economics, Harvard University, "Links Between Growth, Inequality, and Poverty: A Survey," Development Economics Development Research Group, Working Paper 9603, March 2021, pg. 23-26.

The empirical evidence shows that poverty is detrimental to long-term economic growth. Using panel data of 85 countries covering 1960 to 2000, López and Servén (2015) find that a 10 percentage-point increase in the poverty rate reduces the GDP per capita growth rate by 1 percentage point. In particular, an increase in the poverty rate reduces the investment rate for countries with low levels of financial development. There is also evidence that the negative impact of poverty on growth depends on the initial level of poverty. In a sample of 156 countries covering 1960 to 2010, Marrero and Servén (2018) find that for low levels of poverty (below the median), poverty has an insignificant impact on growth (Figure 8). In contrast, when the poverty rate is high, a 10 percentage-point decrease in headcount poverty is associated with an increase in economic growth ranging from 1 to 2 percent per year.

Related evidence comes from the observation that despite the global reduction in poverty rates, cross-country evidence indicates a lack of convergence in poverty rates. Studying 90 developing countries during the 1991–2004 period, Ravallion (2012) finds that two distinctive effects prevented the convergence of poverty rates. First, poverty reduces growth, consistent with the results from López and Servén (2015). Second, high initial poverty dulls the impact of growth in reducing poverty. The combination of these two channels makes it more difficult for the poorest countries to reduce their poverty rates.

Figure 8. Growth in GDP per capita vs Initial Poverty, 1960–2010

A higher poverty rate is associated with lower growth in subsequent decades.

Chart, scatter chart

Description automatically generated

4.1.2. From Inequality to Growth

As an illustration of the relationship from inequality to growth, Bénabou (1996) compares the growth outcomes of East Asian and Latin American economies conditional on the initial levels of income inequality. According to Bénabou (1996), the conventional wisdom among development economists is that the relatively equal distribution of income and land in East Asian economies contributed to their observed high economic growth rates. By the same token, the lack of a similar economic dynamism in Latin America has been attributed to the consequences of high concentration of wealth and income in that region.13

The panel a of Figure 9 reports the correlation between income inequality in 1980 and the average GDP per capita growth in the subsequent 30 years for selected Latin American and Asian economies. Consistent with Bénabou (1996), on average countries that exhibited lower levels of initial inequality also experienced higher rates of economic growth. While there are many other factors that might explain the economic dynamism of these Asian economies, such as the quality of institutions and high rates of saving and investment (Collins and Bosworth 1996), this figure illustrates that income distribution might be one key element for understanding differences in economic performance. An extended sample of advanced and developing countries (Figure 9, panel b) confirms the relationship between initial income inequality and subsequent growth.14

Figure 9. Growth in GDP per capita vs Initial Inequality

Countries that started with lower levels of inequality experienced higher rates of economic growth.

Chart, scatter chart

Description automatically generated

The empirical relationship between inequality and growth has been investigated formally in a number of cross-country growth studies, following Barro and Sala-i-Martin (1995). Many of these studies find that inequality, typically measured by a Gini coefficient, enters with a negative and statistically significant sign in cross-country growth regressions, indicating that an increase in inequality leads to lower economic growth. In a survey of 23 different empirical studies on inequality and growth, for instance, Bénabou (1996) finds that despite differences in data sets, sample periods, and measures of income distribution, the studies consistently find that initial inequality is negatively associated with growth. In particular, the quantitative effects of inequality are quite robust across studies: a one-standard-deviation decrease inequality raises the annual growth of GDP in the range of 0.5 percentage points to 0.8 percentage points.

Various studies examine different dimensions of the relationship. An early work by Alesina and Rodrik (1994) finds that income and land inequality are statistically significant variables that decrease long-term growth in a sample of 70 advanced and developing countries. Perotti (1996) finds a negative and robust association between inequality, inversely related to the share of the middle class (third and fourth quantiles of the income distribution), and growth. He finds that social political instability and fertility rates could be driving the relationship between inequality and growth.

The impact of inequality on growth can also depend on the initial level of development. Barro (2000) estimates the impact of inequality on growth by splitting a sample of 100 countries into high- and low-income samples. In that specification, there is a negative relationship between inequality and growth for poor countries, similar to previous studies, while the relationship is positive for richer countries. The empirical results suggest that in the presence of credit constraints, inequality prevents low-income households from accumulating human and physical capital, resulting in lower growth in poor countries. On the other hand, the positive relationship observed in richer economies is consistent with the traditional growth-enhancing effects of inequality emphasized by Kaldor (1957).

The effects of inequality on output might also differ across economic sectors. For instance, Erman and te Kaat (2019) identify the effect of inequality on industry-level value added growth. The authors use a data set that includes 22 industries in 86 countries for the period between 1980 and 2012. They find that that higher income inequality increases the growth rates of industries that use physical capital intensively, while it decreases the growth rates of industries that use skilled labor intensively. Thus, the lower human capital stock associated with inequality drives its negative effect on growth. At the country level, these results are consistent with the theoretical predictions by Galor and Moav (2004).

#### AND regional inequality foments domestic terrorism.

Peter Lawrence 21, Emeritus Professor, Development Economics, Keele University, "The Global and National Inequality Faultlines: The Economic Dimensions of (In)security," Journal of Global Faultlines, Vol. 8, No. 1, pg. 28-29, June 2021, JSTOR.

A concern for ruling classes throughout the world must be the potentially destabilising effects of inequality, resulting in more than simply their governing parties losing elections. Civil wars, revolutions and terrorist incidents are possible outcomes of inequality. There are many studies that have looked for a relationship between inequality and social and political instability as evidenced, for example, by revolts and terror attacks. Survey data has been used to show that, while controlling for other possible causal variables, inequality has a positive relationship with a preference for revolution (Macculloch, 2005), although what people say and what they would actually do when faced with a potential revolutionary situation is another matter. Indeed, when the evidence is collected for revolutions that have occurred, the relation with inequality is not always in the same direction and, as Macculloch observes, some analyses have found a U-shaped relationship where revolts take place in high and low inequality countries.

Studies into the relationship between inequality and terrorism have shown inequality is positively related to the number of terrorists acts. One study found that controlling for various factors that could cause such attacks, such as types of regime (no relationship to terrorism), civil war (a positive relationship), population size (positive) and levels of economic development (no relationship), an increase in the Gini coefficient by one unit results in a 7.4% increase in the number of domestic terrorist attacks (Krieger and Meierrieks, 2018). The same study tested for endogeneity, that is, that terrorism could lead to income inequality as more state resources were spent on suppressing terrorism and, thus, less available for redistributive measures, and they found that this did not affect the robustness of their findings. Their results suggested mechanisms through which inequality is transmitted to terrorism, the most important being the quality of institutions. For example, they find that inequality results in poor institutional quality and, therefore, for example, more corruption and a poorer level of human rights. They also include a horizontal equality control variable, ethnic discrimination, and find that it is associated with increased domestic terrorism. They suggest that, added to these indirect ways in which inequality affects terrorism, there may be direct ways, as the relative deprivation of the lower income groups results in increasing discontent spilling over into terrorist attacks.

Not surprisingly, they find that using the ratio of the Gini coefficients of gross to net income as the redistribution variable, more equal distribution has the opposite effects, such that a one-unit increase in the Gini ratio results in an 85.3% reduction in terrorist acts. They also find that greater equality is associated with better institutions but negatively associated with investment, as redistribution from higher earners, who save more, to lower earners, who save less, will result in less investment and lower rates of growth. Redistributive policies resulting in higher public expenditure may, according to this argument, crowd out private investment leading to lower growth outcomes. This is a classic neoliberal conclusion and contradicts other findings associated with structuralist economic approaches cited above that suggest redistribution is good for growth as it increases consumption demand and, so, stimulates investment.

Distributions of income and wealth across countries’ populations may be very different across regions, such that interregional inequality may be the key variable determining the amount of terrorism a country suffers. One study found that, after controlling for other possible explanatory variables such as GDP per head, population size, interpersonal inequality, economic decentralisation and openness to international trade, higher interregional inequality increased the incidence of domestic terrorism (Ezcurra and Palacios, 2016).

#### That ensures nuclear acquisition AND sabotage.

Jayita Sarkar 21, Assistant Professor, International Relations, Boston University's Frederick S. Pardee School of Global Studies, "It's Time to Take Domestic Nuclear Terrorism Seriously," The Washington Post, 02/05/2021, https://www-proquest-com.ezproxy.uky.edu/docview/2486553270/826FF6E4CB44410FPQ/1?accountid=11836.

But nuclear terrorism was also a domestic threat in the 1970s. Nuclear power was expected to grow that decade, and a large amount of plutonium (a radioactive material used in nuclear weapon design) was feared to be widely available. By the end of the decade, white-power activists, many of whom were Vietnam War veterans hardened by military training, had organized for a violent armed struggle of "leaderless resistance" against the federal government. To them, the government was the source of unacceptable societal change that hurt White Christian Americans.

In 1978, William Pierce, the founder of the neo-Nazi group National Alliance, published the novel "The Turner Diaries"under the pseudonym Andrew Macdonald. It sold over 500,000 copies worldwide and remains highly popular among white supremacists.

In the novel, right-wing extremists invade the Capitol to overthrow the U.S. government. Its narrator, Earl Turner, gloats that "not one of them is beyond our reach." Dubbed by the FBI as the "bible of the racist right," the novel depicts 18 nuclear explosions in Manhattan alone and the destruction by nuclear weapons of Baltimore, Miami, the California coast and Detroit. It also provides plans to deliberately contaminate with radioactive materials a nuclear power plant in Evan-ston, 111. The novel ends with Turner detonating a nuclear bomb over the Pentagon. He justifies the nuclear explosions and sabotage against non-White populations and "race criminals" (liberal Whites) in the name of establishing white supremacy in the United States and worldwide.

"The Turner Diaries" has inspired racially motivated armed robberies and more than 200 killings in the United States. It greatly influenced Timothy McVeigh, the Oklahoma City bomber, who perpetrated the deadliest domestic terrorist attack on U.S. soil that killed 168 people in April 1995.

The book has received renewed attention after the attack on the Capitol. Amazon has prevented its sale, and major news outlets have reported on its influence over far-right and white-supremacist groups. The analogies are chilling.

The violent white-supremacist ideology that calls for nuclear and radiological attacks against non-White populations has spread outside the United States.

Norwegian far-right terrorist Anders Behring Breivik, who killed 77 people in July 2011, had called for the use of chemical, biological, radiological and nuclear agents against "cultural Marxists," "multiculturalists" and those responsible for the Islamic "colonization" of Europe. In his 1500-page manifesto, he laid out plans for theft or unauthorized access to nuclear weapons and the procurement of nuclear materials through transnational smuggling networks. Breivik recommended the use of radiological agents and nuclear weapons after Jan. 1, 2020 - his deadline for Muslims in Europe to "assimilate." Given the leaderless transnational networks of white supremacists, the call for nuclear and radiological attacks in Breivik's manifesto as well as "The Turner Diaries"poses grave concerns.

Policy experts reassure us that if taken seriously as a threat, nuclear terrorism is both preventable and solvable. That violent white supremacists can easily infiltrate the police, the military and nuclear facilities make them an extremely serious and hard-to-detect national security risk. The involvement in the Capitol attack of the Oath Keepers, a far-right anti-government group that recruits former U.S. military and law enforcement personnel, demonstrates the extent of this threat. Screening far-right extremists within government institutions at local, state and federal levels needs to be a priority for the Biden administration.

#### Nuclear terror causes global war.

Irma Arguello & Emiliano J. Buis 18. Arguello is founder and chair of the NPSGlobal Foundation, and head of the secretariat of the Latin American and Caribbean Leadership Network; Buis is researcher and professor at the NPSGlobal Foundation. 03/04/2018. “The Global Impacts of a Terrorist Nuclear Attack: What Would Happen? What Should We Do?” Bulletin of the Atomic Scientists, vol. 74, no. 2, pp. 114–119.

Making matters worse, there is evidence of an illicit market for nuclear weapons-usable materials. There are sellers in search of potential buyers, as shown by the dismantlement of a nuclear smuggling network in Moldova in 2015. There certainly are plenty of sites from which to obtain nuclear material. According to the 2016 Nuclear Security Index by the Nuclear Threat Initiative, 24 countries still host inventories of nuclear weapons-usable materials, stored in facilities with different degrees of security. And in terms of risk, it is not necessary for a given country to possess nuclear weapons, weapons-usable materials, or nuclear facilities for it to be useful to nuclear terrorists: Structural and institutional weaknesses in a country may make it favorable for the illicit trade of materials. Permeable boundaries, high levels of corruption, weaknesses in judicial systems, and consequent impunity may give rise to a series of transactions and other events, which could end in a nuclear attack. The truth is that, at this stage, no country in possession of nuclear weapons or weapons-usable materials can guarantee their full protection against nuclear terrorism or nuclear smuggling. Because we live in a world of growing insecurity, where explicit and tacit agreements between the relevant powers – which upheld global stability during the post- Cold War – are giving way to increasing mistrust and hostility, a question arises: How would our lives be affected if a current terrorist group such as the Islamic State (ISIS), or new terrorist groups in the future, succeed in evolving from today’s Manchester style “low-tech” attacks to a “high-tech” one, involving a nuclear bomb, detonated in a capital city, anywhere in the world? We attempted to answer this question in a report developed by a high-level multidisciplinary expert group convened by the NPSGlobal Foundation for the Latin American and Caribbean Leadership Network. We found that there would be multiple harmful effects that would spread promptly around the globe (Arguello and Buis 2016); a more detailed analysis is below, which highlights the need for the creation of a comprehensive nuclear security system. The consequences of a terrorist nuclear attack A small and primitive 1-kiloton fission bomb (with a yield of about one-fifteenth of the one dropped on Hiroshima, and certainly much less sophisticated; cf. Figure 1), detonated in any large capital city of the developed world, would cause an unprecedented catastrophic scenario. An estimate of direct effects in the attack’s location includes a death toll of 7,300-to-23,000 people and 12,600-to-57,000 people injured, depending on the target’s geography and population density. Total physical destruction of the city’s infrastructure, due to the blast (shock wave) and thermal radiation, would cover a radius of about 500 meters from the point of detonation (also known as ground zero), while ionizing radiation greater than 5 Sieverts – compatible with the deadly acute radiation syndrome – would expand within an 850-meter radius. From the environmental point of view, such an area would be unusable for years. In addition, radioactive fallout would expand in an area of about 300 square kilometers, depending on meteorological conditions (cf. Figure 2). But the consequences would go far beyond the effects in the target country, however, and promptly propagate worldwide. Global and national security, economy and finance, international governance and its framework, national political systems, and the behavior of governments and individuals would all be put under severe trial. The severity of the effects at a national level, however, would depend on the countries’ level of development, geopolitical location, and resilience. Global security and regional/national defense schemes would be strongly affected. An increase in global distrust would spark rising tensions among countries and blocs, that could even lead to the brink of nuclear weapons use by states (if, for instance, a sponsor country is identified). The consequences of such a shocking scenario would include a decrease in states’ self-control, an escalation of present conflicts and the emergence of new ones, accompanied by an increase in military unilateralism and military expenditures. Regarding the economic and financial impacts, a severe global economic depression would rise from the attack, likely lasting for years. Its duration would be strongly dependent on the course of the crisis. The main results of such a crisis would include a 2 percent fall of growth in global Gross Domestic Product, and a 4 percent decline of international trade in the two years following the attack (cf. Figure 3). In the case of developing and less-developed countries, the economic impacts would also include a shortage of high-technology products such as medicines, as well as a fall in foreign direct investment and a severe decline of international humanitarian aid toward low-income countries. We expect an increase of unemployment and poverty in all countries. Global poverty would raise about 4 percent after the attack, which implies that at least 30 million more people would be living in extreme poverty, in addition to the current estimated 767 million. In the area of international relations, we would expect a breakdown of key doctrines involving politics, security, and relations among states. These international tensions could lead to a collapse of the nuclear order as we know it today, with a consequent setback of nuclear disarmament and nonproliferation commitments. In other words, the whole system based on the Nuclear Non- Proliferation Treaty would be put under severe trial. After the attack, there would be a reassessment of existing security doctrines, and a deep review of concepts such as nuclear deterrence, no-firstuse, proportionality, and negative security assurances. Finally, the behavior of governments and individuals would also change radically. Internal chaos fueled by the media and social networks would threaten governance at all levels, with greater impact on those countries with weak institutional frameworks. Social turbulence would emerge in most countries, with consequent attempts by governments to impose restrictions on personal freedoms to preserve order – possibly by declaring a state of siege or state of emergency – and legislation would surely become tougher on human rights. There would also be a significant increase in social fragmentation – with a deepening of antagonistic views, mistrust, and intolerance, both within countries and towards others – and a resurgence of large-scale social movements fostered by ideological interests and easily mobilized through social media.

### 1AC---Alignment ADV

#### Contention 2 is Alignment.

#### The EU is gravitating towards stricter merger rules targeted at tech-based acquisitions of nascent firms---BUT that creates a legal gap between the EU and US that creates room for diverging enforcement. Only by moving towards alignment AND coordinating with the EC (European Commission) can feasibly solve.

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Acquisitions of Nascent Competitors— A Similar U.S./Non-U.S. Dichotomy

The amount of ink spilled, and Zoom screens filled, on nascent acquisitions is beyond measure. But that does not mean it is easy to predict what the future holds. In fact, the discussions often center as much on purported past agency “mistakes” as on what to do now and going forward. Nor do all jurisdictions have agencies with the power and discretion to reach back and challenge prior nascent acquisitions; and for those that can, they do not all face the same legal standards.

In trying to sort out (below) the nascent acquisition landscape, we find great enthusiasm in the U.S. for fixing lost opportunities from the past—but with an unclear legal path—whereas in the EU merger clearance is final. Nonetheless, for all jurisdictions there is enormous appetite to address nascent acquisitions going forward.

U.S.: Enthusiasm, But What of the Case Law?

As with other areas of enforcement, the U.S. antitrust agencies cannot, absent judicial action, simply break up Big Tech by ordering it to spin off brands and business lines it acquired as start-ups. They must go to court and prove both a statutory violation and that divestiture is the appropriate remedy to restore competition (or that an injunction is the appropriate remedy if the deal is not yet consummated). There is precedent for seeking divestiture of past acquisitions that turn out to be anticompetitive (a subject beyond our scope), but its current application is far from clear. What we highlight here are some of the substantive issues presented under U.S. law for challenging acquisitions of nascent competitors, especially when seeking permanent injunctions or divestitures. These issues, among many others, will be front and center in several of the ongoing litigations.

As a starting point, anticompetitive acquisitions typically are the subject of challenge under Section 7 of the Clayton Act. Section 7 is an incipiency statute; it prohibits mergers whose effect “may be substantially to lessen competition.”21 The original notion was to prohibit anticompetitive mergers before their effects materialize, and to prohibit potentially anticompetitive horizontal, vertical, and conglomerate mergers. Beginning in the late 1970s, however, and continuing more dramatically in the 1980s and forward, the aggressive use of Section 7 was tempered by the agencies and the courts, which feared that the law was [preventing] ~~handicapping~~ efficient mergers. Today, Section 7 is most commonly invoked to challenge horizontal acquisitions of substantial competitors and, at times, vertical acquisitions that may foreclose competition from either upstream or downstream rivals to the harm of consumers. Under current U.S. case law, conglomerate mergers are tough to stop as are (most relevant here) acquisitions of potential competitors—where the target firm is not yet in the market of the acquirer, but may enter, and the market loses the benefit of the entry effect.

For acquisitions involving potential (or future) competition, the Supreme Court in United States v. Marine Bancorporation, Inc. established a tough evidentiary standard: (1) that absent the merger, the potential competitor could enter the market (as a de novo entrant), and (2) that such entry would structurally deconcentrate the market or produce other demonstrable procompetitive effects.22

A present market effect is also required when considering competitors waiting in the wings—the perceived potential competition doctrine. The standard may be a challenge for cases brought under Section 7, and the question now is whether a new line of Section 7 jurisprudence can emerge. For example, could Section 7 apply if a dominant firm forms a policy to acquire all start-ups that it identifies as significant future challengers, and thus builds a moat of protection around its alleged monopoly power? Or could the acquiring firm’s own assessment, prediction, and demonstrable intent provide the requisite inference and proof that each of the acquired start-ups could and would have entered (or expanded) on its own and offered consumer-enhancing rivalry in the market? Could the FTC also make a successful challenge under the more expansive language of Section 5 of the Federal Trade Commission Act? For all of these provocative questions, it will fall to the courts, and maybe eventually to the Supreme Court, to determine the outer boundaries of Section 7.

More immediately, as we see in some of the current litigated cases, the U.S. agencies have decided on a creative mix-and-match theory to challenge acquisitions of nascent competitors, using Section 2 monopolization principles (maintaining monopoly by acquiring competitive threats) for liability, while implicitly invoking Section 7 as the remedial basis for unwinding transactions. Here, the agencies have invoked language in Microsoft:

We may infer causation [of anticompetitive effects] when exclusionary conduct is aimed at producers of nascent competitive technologies as well as when it is aimed at producers of established substitutes . . . . [It] would be inimical to the purpose of the Sherman Act to allow monopolists free reign [sic] to squash nascent, albeit unproven, competitors at will . . . .23

The courts (particularly, now, in the Facebook litigation) will have to decide on the applicability of Microsoft to dominant platform acquisitions of small start-ups.24 On the one hand, courts will need to consider the alleged plan (supported by documents, in the government’s view) to stymie future competition and, on the other hand, the uncertain future of the start-ups at the time of an acquisition as compared with the actual dramatic growth and attractiveness to users of being a part of the platform’s network. While many of these principles are not new, the waters are uncharted in the courts. It will likely take years for the issues to work their way through the U.S. court system, including, in our view, likely action by the Supreme Court.

Finally, in the U.S., in theory there is always a prospect of regulation apart from courts’ antitrust decisions. But the prospect for regulation of acquisitions of nascent competitors is not necessarily rosy; it depends upon political will. Legislation may be especially challenging as the polarized factions of both the Republican and Democratic parties interact with a more moderate Democratic Executive (although one that is being advised by an aggressive progressive, Professor Tim Wu).25 If the politics align, especially with the Democrats’ new ability to garner support for legislation, the prospect of some rulemaking to proscribe dominant firms’ acquisitions of their nascent rivals under some conditions (and with new substantive standards) is not beyond question.

EU/U.K.: An Emerging Prophylactic Approach

Outside of the U.S., the enforcement and regulatory approach to nascent-competitor acquisitions is quite different—in part more restrictive, in part more flexible. On the restrictive side, unlike in the U.S., there is only “one bite at the apple” in the EU for blocking acquisitions with an EU dimension. Once a merger has received clearance from the EU it cannot be investigated again except in exceptional circumstances, such as whether the clearance was based on false or misleading information. This is why many jurisdictions are modifying their merger notification requirements to cover more (if not all) acquisitions by large tech (or other) firms. Equally important, the EU enforcers may not use Article 102 dominance law to block transactions, as the EC Merger Regulation is the exclusive regulatory authority.26 This precludes the hybrid approach currently asserted in the U.S. courts.

The flexibility is in the relative lack of constraining case law and the opportunity to explore new theories and approaches. Specifically, where the U.S. lower courts must grapple with the “potential competition doctrine” and the novelty of using Section 2 to attack consummated acquisitions, the EU and its Member States can explore new enforcement theories with few limiting parameters. Further, unlike with Articles 101 and 102, the Commission’s decisions on mergers are not frequently challenged, and even more rarely reach the Court of Justice. Hence, if the EU believes that a nascent-competitor acquisition by a dominant platform will be anticompetitive under one or more theories of harm, it may pursue that theory, subject to appeal to the General Court and Court of Justice. This provides significant flexibility and enforcement creativity.

Nor are non-U.S. jurisdictions encumbered by the Chicago School conceptions of consumer welfare that prevail in the U.S. (as applied in the merger context). Particularly in the EU and its Member States, therefore, we can anticipate a significant increase in scrutiny of all forms of nascent-competitor acquisitions based on relatively aggressive theories of harm to dynamic competition, coupled, as usual, with vigorous debate over the asserted harm and/or procompetitive justifications for the transaction.

The U.K., however, is likely to take an even more targeted approach to nascent acquisitions, consistent with its broad proposed regulation of large tech platforms. In contrast to the EU (which does not need a regulatory change to its merger review processes to address nascent acquisitions), the CMA has put nascent acquisitions directly in its new regulatory cross hairs. It apparently is more concerned with the growing power of the Big Tech platforms, even if there is a significant (sometimes large) chance that the “but for” competitive threat would never have materialized and the acquisition enhanced the offerings by the platform. As Andrea Coscelli, Chief Executive of the CMA, has highlighted, enforcers in his view need to get comfortable with the notion that the inherent uncertainty of the but-for world is still worth addressing.27 In essence, he is suggesting that competition is better preserved if the agencies take a dynamic and prophylactic approach to nascent acquisitions, a position that would be harder to argue and accept in the U.S. where inherent speculation is frowned upon in the case law both as a matter of liability and in seeking remedies, especially divestiture.

One can also anticipate, or at least prepare for, other jurisdictions to consider similar actions. The concern over nascent acquisitions by large tech firms is a recent and global one,28 and (rightly or wrongly) it appears that outside of the U.S. there may be relative convergence on these more interventionist approaches.

A General Surge in Populism, But Not Uniformity in Approach

Independently of a particular focus on tech platforms (and, primarily, the challenge of dealing with network effects), there is a drumbeat in the U.S. and elsewhere for more aggressively enforcing (or modifying) competition laws to address industry concentration and the power of individual firms.29 Whether referred to as Neo-Brandeisian or populism from a pre-Chicago School age, the thrust is similar: highly concentrated markets are said to lead to relatively higher corporate profits, wage disparity, barriers to entry, and decreased competitive opportunity. To address these perceived problems, the view is that antitrust needs to remove the constraints of a standard that proscribes only short-run, output-limiting, and price-raising conduct. Many in this group (whom we describe as Progressives) embrace a consumer welfare standard, but would apply it much more broadly and aggressively than conservatives.

Others (Neo-Brandeisians) would use consumer interests as one important focus of antitrust, but would widen the lens to consider exploitation of workers (beyond efficiency concerns), sustainability, inequality, and their perspective on democracy (freedom from business power that controls our lives). Moreover, their set of values leads to a policy position, sometimes more symbolic than actual, that seeks to break up Big Tech. For any of these objectives, particularly in the U.S., the question remains what is practical or feasible. Outside of the U.S., the more fundamental question is whether the Neo-Brandeisian debate is relevant given that in many jurisdictions competition law already is geared to control perceived power (although breaking up Big Tech has not seemed to be the first-line remedy).

In the U.S., the same limitations on case law/potential legislation dynamics are at play as with tech platforms, which may make the more aggressive proposals more aspirational than realistic. Every potential cause of action has its long-defined elements, and the consumer welfare standard that permeates theories of harm only has so much flexibility. For example, “abusive pricing” or “unequal bargaining positions” cannot be independent violations in the U.S.—separate exclusionary conduct would need to be present. Likewise, even in the merger space, market definition remains a requisite element that is probably not going to be jettisoned under current case law; whether concentration thresholds are likely to be reduced or burdens of proof shifted is a different question. For all of these long-established U.S. cases and theories, absent legislation, changes will be around the edges and incremental, as courts continue to determine how robustly the U.S. antitrust goals can accommodate such values as innovation, quality, and dynamic competition without crossing the boundaries into unreliable speculation.

While this continued iterative judicial process may add some flexibility under Section 2 and Section 7 (subject to the Supreme Court’s view), these limits will have significant effect. In the view of many, Section 5 of the Federal Trade Commission Act may have more flexibility if the FTC chooses to use it. But true “progressive” developments in the U.S. would require new legislation.

Looking forward, the House is likely to offer piecemeal legislation addressing specific areas of conduct or desired changes in the law.30 But the main focus for anticipated action should be on the Senate, as the new makeup of the Senate will likely shift the focus away from the aspirational House Majority Staff Report and onto the Senate Judiciary Subcommittee on Antitrust and Commerce, led by Senator Amy Klobuchar. Indeed, on February 4, 2021, Senator Klobuchar introduced a bill—the Competition and Antitrust Law Enforcement Reform Act—that would significantly modify Section 7 on mergers and Section 2 on monopolies (though not seeking to break up Big Tech).31 On mergers, the Act would forbid mergers that “create an appreciable risk of materially lessening competition,” where “materially” can be anything more than “de minimis.”32 It would also shift the burden of proof to the parties to disprove those effects for mergers that significantly increase concentration, involve nascent acquisitions by dominant firms (e.g., greater than 50 percent share), or involve mega mergers (over 5 billion dollars).33

As to unilateral conduct, the Act would expressly prohibit “exclusionary conduct,” defined to include any conduct that materially disadvantages competitors and presents an “appreciable risk of harming competition.”34 Again, this adopts a much more prophylactic approach than Section 2. On its face, the Act would appear to overturn Trinko, bring leveraging back into play (as well as a fairly open-ended theory of raising rivals’ costs), much like what we see in practice in the EU and elsewhere. Whether Senator Klobuchar’s bill will garner the needed votes (likely requiring 60) is hard to predict at this stage, but the general anger and frustration among some Republicans toward Big Tech (again, often concerning asserted platform-related censorship) may put many of them in a receptive frame of mind. From a competition policy perspective, and as Senate hearings begin on potential legislation, it is clear that Senator Mike Lee is the figure to follow on the Republican side.35

U.K./EU: More Flexibility, But How Far To Go?

In contrast to the U.S., other jurisdictions have significant flexibility in addressing whether and to what extent they wish to pursue a more progressive agenda for antitrust policy and enforcement. At least as it relates to economic objectives (and the consumer-welfare debate), the EU and some Member States have made their more progressive agenda clear for some time. Executive Vice President and Commissioner Vestager has elaborated on the EU’s digital-economy agenda on the global stage.

Hence, we have long seen from the EU Commission a commitment to interpreting Articles 101 and 102 in ways that promote non-discrimination among Member States, transparency for consumers, opportunities for new entrants and rivals, and no reluctance to invoke fairness in the application of competition principles. Again, this is largely baked into the Treaty itself. And what we see in the tech space, as well as other areas involving more complex markets (e.g., pharma, IP-driven industries), is the EU and Member States trying to figure out how best to apply these principles to the digital age and other complex industries, while still allowing firms to enjoy the benefits of scale and efficiencies. Sometimes the factors will all point in the same direction; but often it will be a delicate balance. Either way, as the EU continues to pursue its enforcement objectives, the debate will continue—and it will not slow down.

Finally, with the relative constraints of U.S. law and enforcement discretion, the future holds only a limited opportunity for convergence between Section 2 of the Sherman Act and TFEU Article 102, with perhaps a greater prospect in addressing mergers under Section 7 of the Clayton Act and the EU Merger Regulation. There is, however, a significant opportunity for an increase in multi-jurisdictional cooperation and coordination, especially as it relates to truly global “mega-mergers” as well as remedies. In this respect, the OECD and ICN are promoting increased cooperation among agencies. A joint OECD/ICN report on the state of international cooperation was presented at the last OECD Competition Committee in December 2020, and this is an area in which the ICN and OECD could make significant strides in the coming years, especially as non-U.S. enforcement continues to converge.36

Socio-Political Objectives: Needed Coordination and Bold Leaders

Beyond the narrowly focused debate that tends to center on the U.S. version of the consumer-welfare standard, there is a broader view of antitrust that is gaining significant traction in several parts of the globe. In the U.S., it is sometimes difficult to see competition law and enforcement evolving beyond the current case law and its free market underpinnings—each based in part on markets that generally work well, on the absence of a history of state-owned enterprise, and perhaps on a certain faith in the purity and continuity of antitrust. But for many other countries, there is an equal and growing pull from two other perspectives: first, industrial policy, recognizing a government role in partnering with industries—or prohibiting or commanding certain behaviors—ideally to the benefit of all marketplace constituents; and second, socio-political objectives as values of or constraints on antitrust, including concerns as wide ranging as sustainability and distributional equality.37 While inclusion of these considerations may be anathema to some (particularly those of the strictest Chicago-School persuasion), the future of global antitrust rightly highlights where these policies are embraced and gaining traction.

The Pandemic: A Need for Global Coordination

Along with the many other lessons to be learned from the enormous tragedy of the global pandemic, one must be that antitrust as usual is not necessarily optimal in a time where there is a critical need for certain types of supplies, innovation, and collaboration. Moreover, for global pandemics, there is the obvious question of how global market coordination can best be effectuated to meet legitimate and demonstrable needs of suppliers and consumers without creating long-term adverse effects on particular markets or consumers.

What we have learned, however, is that different jurisdictions were equipped differently—or not at all—to make antitrust-related adjustments for pandemic conditions. In the U.S., for example, there certainly was discussion, within cases or investigations, of a greater emphasis on “changing market conditions” and “failing/flailing” firm arguments to justify certain collaborations or mergers. While the authorities were open to business review consultation, for the most part the U.S. antitrust analysis was, and remains, ill-equipped to adjust for such events (although in an analogous war footing, past courts have modified antitrust analysis, though with arguably questionable justification and effect). Looking to the future, one naturally asks—as one of the authors has—whether it is not advisable to address the next pandemic with a global, ex ante industrial organization strategy rather than the piecemeal response that we saw in 2020 and that persists today? 38 Given the effect of the pandemic on both lives and markets across the globe, such an effort should have few serious detractors.

#### Those disputes trigger digital protectionism between the US and EU---BUT convergence must happen soon.

Filippo M. Lancieri 19, Postdoctoral Researcher, ETH Zurich. J.S.D., University of Chicago Law School. M.S., Economics, INSPER, "Digital Protectionism? Antitrust, Data Protection, And The EU/US Transatlantic Rift," The Journal of Antitrust Enforcement, Vol. 7, Issue 1, March 2019, Lexis.

IV. The way ahead: Convergence or divergence?

So far, this article presented how the differences between the American and European approaches to data protection provide EU regulators with motivation to strengthen antitrust enforcement in data markets. Moreover, it argued that once this process starts, the unique features of European antitrust policy will prove a perfect incubator, so that antitrust cases against US tech companies for dominance violations should grow. Americans do not share and may not understand neither the motivation nor the antitrust tools employed in the EU. 110 As the Atlantic divide on antitrust enforcement widens (and given that actual protectionist policies are on the rise) 111 calls of digital protectionism should afloat. Tensions run both ways, as Europeans may also be startled by American complaints against what they see as a regular application of the rule of law. 112

With a trade war between the EU and the US looming after a series of trade sanctions, 113 increased strains between two of the world's leading trade and security partners can do little good. 114 The digital economy is a sensitive area and the EU/US safe harbour for data transfer is proof of the damage that may arise from disputes. The first Safe Harbor came after a major trade conflict between the EU and the US over personal data. 115 By striking it down, EU Courts' placed thousands of American and European companies in disarray, 116 reason why business leaders in both jurisdictions welcomed the swift conclusion of the Privacy Shield. 117 The challenge remains, however, on whether it is desirable or possible to bridge such significant cultural differences, or at least develop clear mechanisms that prevents tensions arising from pure misunderstanding.

This remains a contingent question. On one side, convergence may never be necessary. It is perfectly reasonable and may even be optimal that different legal systems will provide different solutions to challenges of a new internet era, forcing agents to adapt to the norms of a given jurisdiction. 118 Lack of convergence is burdensome and may increase the cost of doing business across the Atlantic, 119 but the so far successful implementation of the 'right to be forgotten' experience in Europe demonstrates that both markets are large enough to justify companies adopting different solutions. The risk is that shifts in market behaviour may lead to the 'Brussels' effect' and the export of stricter standards, 120 something that may trigger unpredictable reactions by US authorities facing loss of sovereignty.

On the other, the safe harbour demonstrates how convergence is possible if parties move to bridge differences. As there is more to explore from an academic perspective in this second scenario, this section will focus on that. Bringing together such disparate regimes will require both political motivation and a coherent framework. This part argues that: (i) convergence efforts will require a balancing of the role that economics plays in antitrust enforcement on internet markets on both sides of the Atlantic; and (ii) that recent EU reforms open a window of opportunity for this to happen. In addition, it presents data portability as a mitigating measure that companies may explore to decrease tensions while and if converge does not take place.

#### Digital protectionism eliminates US-EU tech coop---that allows China to fill in toward an authoritarian internet model.

Cosmina Moghior 21, Denton Fellow with the Transatlantic Leadership program at the Center for European Policy Analysis, Protectionism Threatens To Torpedo The Transatlantic Technology Alliance, CEPA, <https://cepa.org/protectionism-threatens-to-torpedo-the-transatlantic-technology-alliance/>

On a broad level, the U.S. and Europe agree on the need for new regulations to limit dangers from the authoritarian digital model. They want to reign in tech monopolies. They want to protect privacy. They want to combat disinformation that threatens democracy.

On a practical level, both favors strengthened export controls of dangerous technology. A good example of cooperation concerns semiconductors. While the US is leading in most stages of the semiconductor supply chain, the Dutch company ASML dominates lithography equipment production. Even under President Trump, the Dutch government agreed to stop ASML from selling its most advanced machines to China.

Unfortunately, though, protectionism threatens to undermine future progress. The Biden Administration’s massive infrastructure plan and new “Supply Chain Disruptions Task Force” aim to keep innovation and production of leading-edge technology at home, making the U.S. a technological leader. Biden’s Buy America Executive Order (EO) encourages domestic procurement of “goods, products, materials, and services from sources that help the American businesses compete in strategic industries and help America’s workers thrive”. The Federal Acquisition Regulatory Council is developing recommendations to extend requirements to information technology.

The U.S. is pouring public money into strategic digital industries. In a rare bipartisan vote, Congress approved $52 billion in subsidies in June for chip research and manufacturing. States from Wisconsin, Texas, and Nevada are showering tax benefits on digital tech giants including Amazon, Apple, and Google to build factories and data centers.

Europe similarly is determined to build its own tech capacities. It promotes the concept of digital sovereignty aimed at providing the continent the capacity to make “autonomous technological choices.” Several projects promote domestic production of critical technologies ranging from next-generation mobile phone production to quantum computing. Public funds already are being spent on the

European cloud computing project GAIA-X aims to break the U.S. stranglehold on cloud computing. While Europe insists that its actions are not protectionist, designed instead to promote and safeguard European values, GAIA-X aims to ensure data protection and limit access of U.S. intelligence to European data. U.S. tech giants including Amazon, Google, and Microsoft have been invited to join, but are banned from joining the board.

The U.S. is home to the world’s largest Internet companies and fears that European regulatory measures will discriminate against them. Plans for a European “digital” tax – put on hold to secure a global corporate tax reform – would disproportionately impact American companies that provide digital services in Europe. A separate Digital Markets Act proposal under consideration at the European Parliament addresses unfair practices of the so-called “gatekeepers,” that operate “core platform services.” Most of the targeted companies will likely be American, beginning with giants Google, Apple, Facebook, and Amazon.

Europe and the U.S. need to step back from pursuing their protectionist instincts, which threatens to allow China’s increasing inroads into the digital market. Beijing is making investments on all continents on projects ranging from education to critical infrastructure. Many countries are turning to China for support and guidance on technological development while the U.S. and the EU focus on their domestic anxieties and ambitions.

A transatlantic tech alliance could provide the blueprint for offering a viable alternative to Chinese inroads in the developing world. Europe and the U.S. need to coordinate against the export of authoritarian practices on the Internet. They can only do this by dropping the push for Buy American and European Digital Sovereignty.

#### Collapses internet openness---extinction.

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The Internet has created an extraordinary new democratic forum for people around the world to express their opinions. It is revolutionizing global access to information: Today, more than 1 billion people worldwide have access to the Internet, and at current growth rates, 5 billion people — about 70 percent of the world’s population — will be connected in five years.

But this growth trajectory is not inevitable, and threats are mounting to the global spread of an open and truly "worldwide" web. The expansion of the open Internet must be allowed to continue: The mobile and social media revolutions are critical not only for democratic institutions’ ability to solve the collective problems of a shrinking world, but also to a dynamic and innovative global economy that depends on financial transparency and the free flow of information.

The threats to the open Internet were on stark display at last December’s World Conference on International Telecommunications in Dubai, where the United States fought attempts by a number of countries — including Russia, China, and Saudi Arabia — to give a U.N. organization, the International Telecommunication Union (ITU), new regulatory authority over the Internet. Ultimately, over the objection of the United States and many others, 89 countries voted to approve a treaty that could strengthen the power of governments to control online content and deter broadband deployment.

In Dubai, two deeply worrisome trends came to a head.

First, we see that the Arab Spring and similar events have awakened nondemocratic governments to the danger that the Internet poses to their regimes. In Dubai, they pushed for a treaty that would give the ITU’s imprimatur to governments’ blocking or favoring of online content under the guise of preventing spam and increasing network security. Authoritarian countries’ real goal is to legitimize content regulation, opening the door for governments to block any content they do not like, such as political speech.

Second, the basic commercial model underlying the open Internet is also under threat. In particular, some proposals, like the one made last year by major European network operators, would change the ground rules for payments for transferring Internet content. One species of these proposals is called "sender pays" or "sending party pays." Since the beginning of the Internet, content creators — individuals, news outlets, search engines, social media sites — have been able to make their content available to Internet users without paying a fee to Internet service providers. A sender-pays rule would change that, empowering governments to require Internet content creators to pay a fee to connect with an end user in that country.

Sender pays may look merely like a commercial issue, a different way to divide the pie. And proponents of sender pays and similar changes claim they would benefit Internet deployment and Internet users. But the opposite is true: If a country imposed a payment requirement, content creators would be less likely to serve that country. The loss of content would make the Internet less attractive and would lessen demand for the deployment of Internet infrastructure in that country.

Repeat the process in a few more countries, and the growth of global connectivity — as well as its attendant benefits for democracy — would slow dramatically. So too would the benefits accruing to the global economy. Without continuing improvements in transparency and information sharing, the innovation that springs from new commercial ideas and creative breakthroughs is sure to be severely inhibited.

To their credit, American Internet service providers have joined with the broader U.S. technology industry, civil society, and others in opposing these changes. Together, we were able to win the battle in Dubai over sender pays, but we have not yet won the war. Issues affecting global Internet openness, broadband deployment, and free speech will return in upcoming international forums, including an important meeting in Geneva in May, the World Telecommunication/ICT Policy Forum.

The massive investment in wired and wireless broadband infrastructure in the United States demonstrates that preserving an open Internet is completely compatible with broadband deployment. According to a recent UBS report, annual wireless capital investment in the United States increased 40 percent from 2009 to 2012, while investment in the rest of the world has barely inched upward. And according to the Information Technology and Innovation Foundation, more fiber-optic cable was laid in the United States in 2011 and 2012 than in any year since 2000, and 15 percent more than in Europe.

All Internet users lose something when some countries are cut off from the World Wide Web. Each person who is unable to connect to the Internet diminishes our own access to information. We become less able to understand the world and formulate policies to respond to our shrinking planet. Conversely, we gain a richer understanding of global events as more people connect around the world, and those societies nurturing nascent democracy movements become more familiar with America’s traditions of free speech and pluralism.

That’s why we believe that the Internet should remain free of gatekeepers and that no entity — public or private — should be able to pick and choose the information web users can receive. That is a principle the United States adopted in the Federal Communications Commission’s 2010 Open Internet Order. And it’s why we are deeply concerned about arguments by some in the United States that broadband providers should be able to block, edit, or favor Internet traffic that travels over their networks, or adopt economic models similar to international sender pays.

We must preserve the Internet as the most open and robust platform for the free exchange of information ever devised. Keeping the Internet open is perhaps the most important free speech issue of our time.

#### AND rising balkanization stymies Middle East growth.

Mohammed Soliman 21, Non-Resident Scholar, MEI's Cyber Program and Egypt Program. Senior Associate, McLarty Associates’ Middle East and North Africa Practice, "In the Middle East, Cyber Sovereignty Hampers Economic Diversification," Middle East Institute, 01/06/2021, https://www.mei.edu/publications/middle-east-cyber-sovereignty-hampers-economic-diversification.

Rapid and unprecedented transformation in the Middle East, whether political, social, or technological, is forcing governments to reckon with enormous changes. Many governments are responding by attempting to pursue two contradictory paths forward — cyber sovereignty and digital transformation — and they might end up not achieving either.

Since its start a decade ago, the Arab Spring has changed the Middle East's geopolitics and tech landscape. Regional governments were not ready to deal with the budding, tech-savvy millennials in the streets of Cairo, Benghazi, and Sana'a. The Twitter- and Facebook-empowered generation ended the multi-decade-long reigns of Egypt’s Hosni Mubarak, Libya’s Moammar Gadhafi, and Yemen’s Ali Abdullah Saleh. The removal of these long-serving autocrats sent shockwaves across the region and made its capitals much more attentive to technology's influence on their societies. Realizing the importance of cyber sovereignty, especially when it comes to keeping citizens' data within national boundaries, known as “data localization,” governments began issuing laws mandating international and local companies to house their data locally.

Recently, MENA governments appear to be eschewing the U.S. approach to data privacy in favor of the European General Data Protection Regulation (GDPR) model as the region enacts a new spate of regulations regarding the treatment of consumer data. Egypt, for instance, approved the Personal Data Protection Law No. 151 in February 2020, which prohibits the transfer of personal data to recipients located outside Egypt except with the permission of the Egyptian Data Protection Center. Also, in 2020, the Saudi National Cybersecurity Authority (NCA) released a draft document for Cloud Cybersecurity Controls (CCC), which sets the minimum cybersecurity requirements for cloud computing. As part of the UAE's National Cybersecurity Strategy, the Emirates is set to launch a GDPR-like national data law, expected to drop within the coming months. The Dubai International Financial Center (DIFC) and Abu Dhabi Global Market (ADGM) free zones have already implemented data protection laws similar to the GDPR.

But whereas EU regulators convincingly communicated that the GDPR was intended to protect European citizens’ privacy across jurisdictions, safeguarding privacy has not traditionally been a focus for Middle Eastern governments. The cyber-sovereignty-centric approach to data regulation could be used for law enforcement activities, however.

Saudi, Emirati, and Egyptian approaches

While pursuing a sovereignty-centric approach to data governance, Saudi Arabia, the UAE, and Egypt — the biggest regional economies in that order — have also emphasized their goal of implementing massive digital transformation strategies.

Under Vision 2030, Saudi Arabia’s long-term economic development plan, the kingdom implemented a national transformation strategy to diversify its economy and shift it from being oil-powered to digitally-powered. The kingdom’s ambition is to become a global tech leader and digital hub in the Middle East. To prove its seriousness, Riyadh has: a) introduced legal frameworks, legislation, and various strategies that cover cloud computing and artificial intelligence (AI); b) forged partnerships with global technology companies; c) led international tech efforts and initiatives; and d) embraced the high-tech smart city future via its planned $500 billion NEOM city along the Red Sea.

The UAE is a leading digital economy in the region as a result of years of investing in digital infrastructure, forging international partnerships, and positioning Dubai and Abu Dhabi as the go-to regional hubs for international technology companies. So when COVID-19 caught the world by surprise, the UAE emerged as one of the most digitally-empowered economies with the ability to mobilize to meet the digital requirements of the pandemic, i.e., a swift transition to remote working and schooling, implementation of advanced contact-tracing mechanisms, and a digitally-enforced lockdown.

Unlike Saudi Arabia and the UAE, Egypt went through years of political upheaval that made Cairo lag behind its regional peers, especially in technology. For instance, Egypt rolled out 4G network infrastructure in 2017, while Saudi Arabia and the UAE introduced it in 2011 and 2012, respectively. After achieving relative political stability, the government now aims to make up for lost time. Guided by Egypt's ICT 2030 Strategy, it plans to transform the country into a regional and international tech center, benefiting from Egypt’s demographics with a population of 100 million and its geographic location central to both Asia and Europe. Furthermore, Egypt is introducing much-needed regulatory frameworks, building and transforming smart universities, working to host Huawei's first cloud data platform in Africa, and building its first smart city, "The Administrative Capital." Egypt is among the very few emerging markets that has grown during the COVID-19 pandemic, which might incentivize more tech companies to consider entering the market in the post-COVID-19 era.

Saudi Arabia, the UAE, and Egypt did considerable work to upgrade their digital infrastructure, invest in their digital workforce, forge partnerships with big tech companies, and build smart cities to position themselves as regional and international tech hubs. However, simultaneously, the three countries embraced a cyber-sovereignty-centered approach to data regulations based on their treatment of cyberspace as a fundamental pillar of state sovereignty. This has been largely driven by fear of external political influence, rooted in the tumult of the Arab Spring and the political experience of the past decade, as well as a fear of external control of local data. The need for protecting citizens' data is legitimate, but the over-emphasis on restrictive cyber-sovereignty-centered data regulations could hurt their ambitions to become tech hubs in the short term.

Resource depletion

Extreme versions of data localization requirements would hurt international tech companies operating in these markets by shifting their resources from efficiently moving data across borders toward instead spending millions to establish local cloud centers. Typically, big tech companies hold user data in large cloud-connected data centers in strategic locations in closer proximity to their customer base and internet exchange points. These new requirements could raise costs for corporations by obligating them to build new data centers in every market without a meaningful payoff to users.

Isolationism from the world

The impact of data localization is not only limited to putting added pressure on corporate resources though. Restrictions on the movement of data across borders also limit access to capital and investment and diminish the ability of banks and governments to assess borrowers’ creditworthiness and ban fraudulent activities. For instance, Mastercard’s Chief Product Officer Michael Miebach said that data localization laws in India take “away the capability to see the broader world,” meaning a lender in one market wouldn’t be able to access financial records from another, making it difficult to make an informed lending decision.

Negative impact on remittances

Saudi Arabia and the UAE are a major source of remittances for Egypt, and there is an increasing effort to expand country-to-country mobile money services with the aim of boosting trade among the three nations. Between January and September 2020, the Egyptian diaspora, mainly in the GCC, sent home a total of $22.1 billion. Traditionally, the remittances are sent through bank transfers or in cash. Country-to-country mobile money services are one of the drivers for Saudi Telecom’s (STC) efforts to buy a stake in Vodafone Egypt, Egypt’s biggest telecommunications company and a major player in the growing mobile payment business. The Egypt-Saudi country-to-country mobile money service efforts will be correlated with the facilitation of data transfer across nations, and sovereignty-centric data localization would prove to be an eventual obstacle.

Halting innovation

In Saudi Arabia, the UAE, and Egypt, data localization requirements might hinder local firms and startups' abilities to harness the power of data analytics — by moving their data freely across borders — to enhance their products, improve user experiences, and boost their competitiveness. Additionally, the data localization requirements will likely dampen international companies' interest in the three markets and limit customers' access to leading digital services and technologies. As a result, the protectionist approach to data could ultimately stand in the way of the three countries' plans and ambitions to encourage innovation, and eventually become regional and global tech centers.

Saudi Arabia, the UAE, and Egypt have been aggressively working on implementing a large-scale digital transformation, attracting international tech companies, building high-tech smart cities, and investing heavily in their technology-based human capital. In a parallel track, the three governments have joined a growing global trend of data localization, which is required to safeguard citizens' personal data and ultimately create a regional and international framework on data processing. The cyber-sovereignty-centric approach to data limits innovation and economic growth, contributes to the balkanization of the internet, and will ultimately impede the three countries’ efforts to diversify their economies.

#### That inflames the region in conflict.

Ari Heistein et al. 21, Research Fellow and Chief of Staff to the Director at the INSS; Daniel Rakov, Research Fellow at the INSS; Dr. Yoel Guzansky, Senior Research Fellow at the Institute for National Security Studies, "What Will the Middle East Look Like In 2030? An Israeli Perspective," Middle East Institute, 03/01/2021, https://www.mei.edu/publications/what-will-middle-east-look-2030-israeli-perspective#pt4.

The global economic crisis drags on long after the COVID-19 health crisis abates, and so energy prices remain depressed and the economies of the Middle East are hard hit, including the wealthy Gulf states. This leads to a decline in the interest of great powers in the region. However, the U.S. and Europe continue to focus on the global importance of human rights and democracy, pressuring Arab regimes throughout the region to comply with them and threatening sanctions if they do not.

The Middle Eastern regimes’ incompetent handling of the COVID-19 crisis along with worsening structural economic problems leads to a growing sense of frustration among the populations. Radical Islamic groups are viewed by growing numbers of the general public as attractive anti-regime alternatives.

The rise of the sea level combined with an earthquake in the Mediterranean in 2025 generates a tsunami that hits the city of Alexandria hard,37 killing thousands and leaving 1 million homeless. The widespread public criticism of the regime caused the military to announce President al-Sisi’s resignation, beginning a long period of political unrest throughout the country.

In the second half of the decade, Israel capitalizes on the relative weakness of Egypt and the Gulf states in order to expand cooperation with them. There is a significant rise in demand from these Arab states for joint ventures with Israel on technology related to desalination and agriculture — and this helps them to cope with climate change more successfully than many other states in the region that refuse cooperation with Israel.

Extreme drought in Iran leads to a wave of protests that forces the regime to take especially harsh measures to crush dissent. This timing, in addition to the social and economic crises ripping through Lebanon, is identified by Israel as an opportunity to take military action to degrade Hezbollah’s military capabilities and the Iranian nuclear project. Israel destroys Iranian nuclear sites in Natanz, Isfahan, and Fordow. Tehran responds with a symbolic missile attack on Israeli soil, and a “Three-Day War” between Israel and Hezbollah ensues. Israel strikes thousands of Hezbollah targets in Lebanon, but suffers significant damage to its own infrastructure from precision missile strikes. Iran sets out to rebuild its nuclear program in heavily fortified underground sites and quickly reinforces Hezbollah capabilities, including the provision of additional stockpiles of precision weapons.

After stabilizing the situation in Tehran and putting an end to the domestic unrest, the Government of Iran undertakes a policy of increasing support for the militias in Iraq (in the context of an ongoing civil war in the divided country) and launching covert campaigns to destabilize the Gulf monarchies.

Economic distress in Jordan results in the overthrow of the Hashemite ruler by Islamist forces, which then leads to increased tensions with Israel and ultimately the abolition of the 1994 peace agreement. Infiltrations from Jordan oblige Israel to build an extensive fence to protect its eastern border.

Radical Islamic terror, which rears its head in the West Bank following the war with Hezbollah and regime change in Jordan, compels Israel to re-occupy that territory and dismantle the PA. Ironically, it is with Hamas in Gaza that Israel is able to reach an interim agreement that includes investments in and development of Gaza supported by the Qatar-Turkey axis. Continued low energy prices have made the project of shipping gas from Israel to Europe no longer economically viable, and the Israeli government decides to use the gas for internal consumption and to sell it to Gaza.

This scenario demonstrates that a “great power vacuum” and resulting deterioration of the regional order could be accompanied by opportunities for Israel to diminish significant military threats at a lower cost. However, without political maneuvers to consolidate those gains, they could prove to be short-lived and take on considerable risk for a multi-front crisis. It also highlights the formidable threats that climate change might pose to regional regimes as early as the next decade.

#### That goes nuclear.

Andrew Futter 21, Associate Professor, International Politics, University of Leicester. Director of Research, Politics & International Relations, University of Leicester, "Nuclear Proliferation and Nuclear Ages," in The Politics of Nuclear Weapons, Chapter 4, pg. 73-80. edited for OCR errors.

In the Second Nuclear Age, the greatest risk no longer appears to be from a large-scale confict between major powers (although this possibility always remains) but instead from regional instability in the Middle East, South or Northeast Asia, or even a non-state actor armed with a nuclear weapon (see Chap. 9).18 This threat has been exacerbated by the spread of Weapons of Mass Destruction technology, and particularly the combination of nuclear and ballistic missile capabilities to new actors across the globe. Ultimately, the central theme of the Second Nuclear Age is that the spread of the bomb, along with the means to build and deliver nuclear weapons, to new actors has changed the central dynamics of the global nuclear order, and consequently we may no longer be able to rely on the nuclear thinking and toolkit that helped us to survive the First Nuclear Age. In the words of Fred Ikle, writing in 1996:

Half a century after it began, the nuclear drama has reached the conclusion of its frst act—a rather happy ending in spite of the gloomy prospects for civilization that darkened the stage at the outset. This respite, though, is not a lasting redemption from the dangers of nuclear warfare.19

The Nuclear Proliferation Debate: Optimists and Pessimists

The thinking that led to a conceptualisation of nuclear history into two distinct nuclear ages is also reflective of the broader debate about the role of nuclear weapons in international politics. In essence, the relative stability, or at least the lack of major interstate war, of the First Nuclear Age gave rise to the notion that nuclear weapons had helped to “keep the peace” during the Cold War, and that horizontal nuclear proliferation might therefore be stabilizing. This is based on the theory of the nuclear revolution (discussed in the next chapter) and specifically the notion that the advent of nuclear weapons fundamentally changed warfare, because no rational actor would want to risk attacking an adversary if they could retaliate with nuclear weapons. Tus, a certain level of stability might be achieved between nuclear-armed states that might not otherwise exist. However, this view of nuclear history, and of the stabilizing potential of nuclear weapons, is challenged by those who believe that vertical nuclear proliferation and a reliance on rationality and luck are not a good basis for international politics and security. They also question the post-hoc view that nuclear weapons were the main reason that the Cold War didn’t turn hot and warn against using this potentially flawed analogy today.

The concern that nuclear weapons will spread to new actors that characterize the Second Nuclear Age has provided the backdrop for the nuclear proliferation debate. The question at the heart of this debate is whether nuclear proliferation to new actors will stabilize or destabilize international politics and whether nuclear proliferation makes inter-state, and possibly nuclear, war more or less likely. This subject is at the center of a discussion between two political scientists, Kenneth Waltz and Scott Sagan. The debate can be succinctly explained as follows:

Kenneth Waltz argues that fear of the spread of nuclear weapons is exaggerated: “More may be better” since new nuclear states will use their weapons to deter others from attacking them. Scott Sagan argues that the spread of nuclear weapons will make the world less stable: “more will be worse” since some new nuclear states will engage in preventive wars, fail to build survivable forces, or have serious nuclear weapons accidents.20

We can think of this debate as being split between proliferation optimists and proliferation pessimists and centring on the wisdom and reliability of Mutual Assured Destruction as a mechanism for stability and security (see Chap. 5). Kenneth Waltz is seen as the champion of the nuclear proliferation optimists, and Scott Sagan for the pessimists. Te central tenets of these two positions are explained below:

The proliferation optimists hold that horizontal nuclear proliferation should not necessarily be viewed as automatically destabilizing. As Kenneth Waltz explained in 1981:

Those who dread a world with more nuclear states do little more than assert that more is worse and claim without substantiation that new nuclear states will be less responsible and less capable of self-control than the old ones have been. … Such fears have proved unfounded as nuclear weapons have slowly spread. I have found many reasons for believing that with more nuclear states the world will have a promising future.21

This is partly because:

New nuclear states will confront the possibilities and feel the constraints that present nuclear states have experienced. New nuclear states will be more concerned for their safety and more mindful of dangers than some of the old ones have been.22

Ultimately, this viewpoint believes that “Nuclear weapons reasonably used make wars hard to start.”23 As such, the spread of nuclear weapons—in certain circumstances—should actually be welcomed, and retaliatory nuclear deterrence and MAD does and should remain the bedrock of global nuclear relations.

The proliferation pessimists contend that horizontal nuclear proliferation can only ever lead to an increase in nuclear dangers and the possibility of nuclear use. Pessimists point to a number of factors that make horizontal proliferation potentially dangerous: the growth of the threat posed by nuclear terrorism and illicit nuclear networks (see Chap. 8); the possibility of nuclear accidents; the difficulties of ensuring civilian control and safe and secure command and control of nuclear weapons (see Chap. 5); the specter of preventive war against aspirant nuclear states (see Chap. 8); the problem of building survivable second strike forces; and the fact that stability through proliferation rests on actors always behaving rationally at all times.24

Foremost amongst these however is a critique of the misplaced belief that nuclear weapons helped keep the peace during the First Nuclear Age. In the words of Sagan, writing in 2006:

Deterrence optimism is based on mistaken nostalgia and a faulty analogy. Although deterrence did work with the [United States and] the Soviet Union and China, there were many close calls; maintaining nuclear peace during the Cold War was far more difficult and uncertain than US ofcials and the American public seem to remember today.25

Proliferation pessimists focus on the problems of organisational culture and the fact that new nuclear actors are perhaps more likely to experience nuclear accidents. As Scott Sagan explains, “professional military organisations— because of common biases, infexible routines, and parochial interests—display organisational behaviors that are likely to lead to deterrence failures and deliberate or accidental nuclear war”.26 Newly armed nuclear states might also be less likely to be able to prevent unauthorized use because they lack the positive mechanisms of strong civilian control.27 Consequently, pessimists argue that retaliatory nuclear deterrence (and MAD) may not represent the panacea that it is held to be by proliferation optimists. We can compare and contrast these views in Table 4.5 below:

Nuclear Latency and Virtual Nuclear Arsenals

While only a small number of states have taken the decision to build nuclear weapons, (and the vast majority have decided not to) the peculiarities of nuclear technology means that there exist a number of states theoretically capable of building nuclear weapons at short notice should they chose to, but which are not currently considered to be nuclear armed states. These states possess their own civilian nuclear programmes, often including the ability to produce highly enriched uranium or plutonium 239 and have a relatively advanced military infrastructure that could be used to develop a nuclear weapon (for more on this see Chap. 11). While these states may not be able to build a working bomb overnight (or in total secrecy), they could probably do so in a relatively short space of time should they choose to—although estimates of this vary from case to case and amongst experts. These states are known as virtual nuclear weapons states or threshold nuclear weapons states because they adopt a position referred to as nuclear latency. As Anver Cohen and Joseph Pilat explain:

Virtual weapons are indeed a reality of physics and cannot be ignored, because knowledge, experience, materials and other requirements to make nuclear weapons are widespread. A continuum of virtual capabilities exists, ranging from general technology difusion and the existence of nuclear energy programmes to conscious decisions to develop or maintain militarily signifcant nuclearweapons capabilities.28

[Table omitted]

Nuclear latency remains one of the biggest proliferation challenges facing the international community today

The complication with nuclear latency stems from the fact that the technology needed for a civilian nuclear power programme is very similar to that needed to produce fissile material for a bomb, and because some military hardware designed for non-nuclear weapons systems can be modified to deliver nuclear weapons (aircraft or missiles for example). Te problem is compounded by the central bargain of the 1968 Nuclear Non-Proliferation Treaty whereby all states that have signed the Treaty as Non-Nuclear Weapons States have a right to produce their own civilian nuclear energy (for more on the NPT see Chap. 8). As a result, states can move fairly close to acquiring a nuclear “breakout” capability without actually undermining the NPT or breaking international law (this is at the heart of the current controversy over Iran’s civilian nuclear programme and whether or not that is being used as a cover to develop nuclear weapons). With hundreds of civilian nuclear facilities and powerplants operating in dozens of countries worldwide,29 the challenge of nuclear latency is ever present. According to the then Director of the Atomic Energy Agency, Mohammed ElBaradei in 2010:

Some estimates indicate that 40 countries or more now have the know-how to produce nuclear weapons, which means that if they have the required fssile material—high enriched uranium or plutonium—we are relying primarily on the continued good intentions of these countries.30

While ElBaradei’s statement should not necessarily be interpreted as meaning that all of these states will or could easily build nuclear weapons, it does underline the importance of this challenge. Indeed, and despite the Fukushima nuclear disaster in Japan and the decision taken by Germany in 2011 to phase out civilian nuclear power,31 the global trend could be toward more rather than less nuclear power generation in the future (for the implications of this see Chap. 11).

In theory, any country with an active civilian nuclear industry and a modern weapons programme could build a nuclear bomb, although this would not be a straightforward task for any nation that decided to do so. The best-placed states to do this have full control of the nuclear fuel cycle, i.e. they can enrich the fuel for (uranium) and/or separate the by-products of nuclear fssion (plutonium). States that operate a civilian nuclear power capability but have to buy nuclear fuel from abroad are far less of a proliferation risk, although because plutonium is a by-product of uranium fssion (see Chap. 2) these civilian power plants must be closely monitored by the relevant international authorities, such as the International Atomic Energy Agency (IAEA). However, technological capabilities are only one dynamic of proliferation and must of course be matched with the political will required to build a bomb. Developing a nuclear warhead small enough to be placed on a missile and that can survive the pressures of fight and possibly atmospheric re-entry for example is a very difcult task, although by no means insurmountable for a modern state. In general, a nation wishing to move from latency to full nuclear weapons capability would meet signifcant challenges, not least keeping the programme secret from the international community and the International Atomic Energy Agency (the world’s nuclear watchdog).

Below are a number of examples of states that we might consider as having various degrees of nuclear latency:

* Japan. Japan is usually held up as the model of a latent nuclear weapons state because it has an advanced civilian nuclear industry, the ability to produce highly enriched uranium or plutonium (in addition to the large stockpiles it already has) and a modern military. Given the geopolitical tensions in Northeast Asia, the threat that Japan may decide to “go nuclear” is ever-present, although most observers suggest that there is little enthusiasm for such a move, and Japan remains a key member of the Non-Proliferation Treaty. However, Japan could probably build a deliverable nuclear weapon if it chose to within a relatively short space of time (maybe less than a year).32 As Mark Fitzpatrick noted in 2019, “Te biggest obstacles to a Japanese nuclear weapons program aren’t technical or logistic; they are political, legal, and cultural.”33
* South Korea. South Korea operates a number of civilian nuclear power plants and has expressed an interest in acquiring the technology necessary to control the nuclear fuel cycle (it can’t currently enrich uranium or reprocess plutonium).34 It also theoretically has the infrastructure and manufacturing base to support a nuclear weapons programme.35 Like Japan and Taiwan, South Korea sits in a potentially volatile region and future changes could drive the case for a bomb. South Korea also previously hosted US tactical nuclear weapons on its territory during the Cold War (until 1991) and is believed to have entertained the idea of a home-grown nuclear weapons efort in the past.36 Te likelihood of a future nuclear-disarmed North Korea and the credibility of the US-extended guarantee are probably the key variables in any future move toward acquiring the bomb.37
* Taiwan. Taiwan is not a member of the Non-Proliferation Treaty given its unique status in international society and has previously had an indigenous nuclear weapons programme in the 1970s. While it is not currently believed to have enrichment or reprocessing capabilities, Taiwan does have specifc regional concerns that could lead to arguments for a nuclear weapons capability, but the costs of doing so are possibly too high for the time being (US opposition, international condemnation, or even a Chinese pre-emptive strike). Taiwan would probably also need to build a suitable missile and warhead.38 As Arthur Ding suggested in 2012, “Despite the logic that strategic logic might dictate the acquisition of a modest nuclear arsenal. Taiwan is unlikely to develop nuclear weapons.”39 But this could of course change in the future.
* Brazil. Brazil possesses all the major elements needed to produce fssile material for a bomb (from an indigenous supply of uranium ore to enrichment and the ability to fabricate nuclear fuel) but currently lacks the means to deliver nuclear weapons should it choose to build them, although it has previously had a nuclear bomb programme (see Chap. 10). Brazil is also an active member of the Non-Proliferation Treaty and is seen as an unlikely future nuclear weapons state at the time of writing.40
* Iran. Iran is a member of the Non-Proliferation Treaty, but it has long been suspected that its nuclear programme could be designed for military purposes. Iran appears to be seeking to achieve full control of the nuclear fuel cycle, which would mean an ability to produce highly enriched uranium and plutonium, and has a large military, including a relatively advanced ballistic missile programme. Iran is perhaps the biggest concern for future proliferation due to its current geopolitical situation,41 and especially after the US withdrew from the Joint Comprehensive Plan of Action in 2018 (for more on Iran and the Iran Nuclear Deal see Chap. 7).
* Saudi Arabia. Sitting at the heart of a region with ever-changing security requirements—not least the possibility of a nuclear-armed Iran on its doorstep, coupled with a perceived decline in US influence, and with an advanced infrastructure and burgeoning economy, Saudi Arabia represents a serious nuclear proliferation concern.42 Saudi Arabia has only a rudimentary civilian nuclear infrastructure, but it is rumoured to have close nuclear ties with Pakistan and other Gulf Emirates states that do.43 It also has the resources to support a nuclear weapons programme.

#### The plan harmonizes divergences resulting from weak US merger law---AND, it rejuvenates US leadership in antirust.

Eleanor M. Fox 19, Walter J. Derenberg Professor, Trade Regulation, New York University School of Law, "Platforms, Power, and the Antitrust Challenge: A Modest Proposal to Narrow the U.S.-Europe Divide," Nebraska Law Review, Vol. 98, No. 297, 2019, Lexis.

Like the U.S., the EU went through two important phases with regard to the question: When is single-firm conduct anticompetitive? [\*303] In the first stage, EU law was formalistic. The law was aggressive against dominant-firm conduct that excluded rival firms. It contained a broad presumption against exclusive contracts by dominant firms. The second phase came in the 1990s, and, even more dramatically, in the first decade of the new millennium. This was epitomized by the European Commission's 2009 guidance paper on dominant firm conduct. 15In this second phase and in the guidance paper, the European Commission adopted, and the courts followed, a more economic approach. 16While incorporating economic analysis into the law, Europe retained certain guiding principles and approaches reflecting the place of antitrust in the Treaty. These approaches include that EU law is about community and integration. EU competition law is sympathetic with EU internal market free-movement law, which stresses the importance of free movement of goods, services and people across Member State lines. Likewise, EU law is antagonistic to Member State restraints and the privileges states grant to favored firms. Such restraints and privileges are distortions of competition. Both aspects - respect for free movement and antagonism to state restraints - are imported into EU competition law and specifically into abuse of dominance law. EU competition law stresses market access and the right of firms to contest markets on the merits. It is sympathetic to firms' access to networks. 17It is hostile to dominant firms' use of leverage to take advantages for themselves at the expense of competitors, thereby unleveling the playing field. EU competition law does not aim to protect inefficient competitors, but rather its precedents forge a clearer path for firms to access markets on their merits, free from obstructions by dominant firms. Still, detractors (including many in the U.S. antitrust community) contend that the EU excessively enforces its antitrust law against dominant firms (often American ones), and insist that the EU approach does protect competitors at the expense of consumers.

[\*304]

C. Presumptions and Divergences

EU competition law adopted its more economic approach nearly two decades ago. However, it never adopted the "Chicago School" premises. It does not assume markets work well. It does not admonish us to trust the market - especially not when the market is concentrated and dominated by a single firm. It does not presume that antitrust intervention is likely to mess up the market and chill competition and innovation. Its teaching implies a belief that lowering barriers to entry and keeping a clear path for challengers is likely to make the market more dynamic and thus serve consumers better. When dealing with innovation incentives, U.S. cases are likely to assume that antitrust action against a dominant firm will chill the firm's incentives to invent, 18 while EU law is more likely to find that the dominant firm's challenged conduct will chill the outsiders' incentives to invent. EU cases have documented this lost innovation. 19 U.S. competition law abhors duties of dominant firms to deal with competitors, calling such duties "forced sharing" and undermining incentives to invent. 20EU law applies a contrary principle: dominant firms, especially firms with power in one market that compete in an adjacent market, have a special responsibility not to impair rivals' competition on the merits. 21

Both jurisdictions aim to preserve and facilitate sustainable low pricing even if it displaces firms that cannot keep up with the competition. U.S. law, however, makes it harder than EU law to successfully challenge below-cost pricing. U.S. law requires the plaintiff to prove a probable recoupment scenario - that is, after the predatory siege, defendant must be likely to recover its losses by charging monopoly [\*305] prices high enough and long enough. 22EU law does not require proof of probable recoupment. 23It is enough that the predator thought the scheme was worth it. Because of the strict U.S. requirements, predatory pricing violations are virtually never proved under U.S. law.

Apart from these different presumptions and principles, much of the law governing unilateral conduct is very similar on both sides of the ocean. But the different presumptions and principles have resulted in diametrically different results on nearly identical facts in key cases, especially when the conduct challenged is a refusal to deal with competitors or customers. 24The differences reveal themselves in assessing the conduct of the big data platforms, as the Article shows below.

III. IMPLICATIONS FOR HIGH TECH, BIG DATA

A handful of high tech giants dominate markets. The firms were started from scratch by entrepreneurs with great ideas, and they attract millions of users every day. They are networks and platforms, have economies of scale, and feature network effects and winner-take-all markets. On the one hand, the network effects please users (who get more "friends" or suppliers or buyers), but on the other hand, they create uncommonly high barriers to entry and reinforce their market power. The firms offer their products "free" on one side of the market (but users give up their data); on the other side, they make huge revenues from advertising, including by selling the data of their users. The high tech firms operate with low-price models, not the high prices that traditionally attract antitrust attention. Some have been exposed for serious misuses or lax protection of data as well as for acquiring personal data from third party sources without permission. Some have waged media campaigns of false information against critics. They offer services in competition with the firms they host on their platforms, and they prefer their own products and demote their rivals, undermine creative start-ups by appropriating their ideas, mine the data of the firms they host to preempt the next big thing, snap up the start-ups that are potential competitive threats, and breach privacy rights of the platform's users. Much of this conduct may violate consumer protection and privacy protection laws. A question is whether the [\*306] firms are also violating the competition laws. Does the answer depend on whether the laws are those of the U.S. or those of the EU (and the many jurisdictions that follow EU law)? It might.

The conduct we shall examine poses challenging questions under Section 2 of the Sherman Act, which prohibits monopolization. The first step of analysis is defining the market, and the exercise of market definition is difficult. 25The second step is proof of monopoly power. Monopoly power is traditionally defined as the power to raise price above a competitive price and reduce output for a significant time. 26In platform markets, this proof may not be possible. The third step is proof of conduct that is anticompetitive. The court may require the plaintiff to establish that the conduct lowers output and raises prices 27by anticompetitive means. This may not be possible. The platforms are accumulating and using new forms of power. The big tech abuses do not fit neatly into the "Chicago School" requirements.

Under EU competition law, the case for abuse of dominance is easier to make. EU law is less demanding of proof of definition of the market. Moreover, a firm might hold a dominant position even when it does not have monopoly power under the neoclassical economists' definition. Status as a "gatekeeper" (power over a dominant platform) might suffice. 28A firm might abuse its dominance when it uses its power in one market to get significant competitive advantages in an adjacent market and does so by conduct that blocks rivals' access and has no competitive merit, 29even if it does not get market power in the second market.

These qualities of EU law make it a more flexible tool than the Sherman Act to deal with the new problems posed by high tech/big [\*307] data. Section 5 of the Federal Trade Commission Act, which prohibits unfair methods of competition, also has this flexibility, at least in theory. 30

IV. THREE EXAMPLES OF ALLEGED PLATFORM ABUSE

A. Google/Comparative Shopping

1. EU Law

In the Google/Comparative Shoppingcase, the European Commission condemned Google, as the dominant search engine, for demoting its rivals and preferring itself on its platform. Here are the salient facts it found:

Google held more than 90% of the general search market in Europe. It launched comparison shopping services. Google was not the first to offer comparative shopping services on its platform; others preceded it. Google entered this market in 2004 with a product called Froogle. But Froogle was not a good product. When Google Search treated Froogle neutrally with its rivals, Froogle performed poorly. This means, under neutral treatment, Froogle did not rank high on the responses to consumer search queries; it was relegated to back pages where it did not get many clicks - and clicks are the way products generate revenues through advertising. In 2008, Google changed its strategy fundamentally to automatically give a prominent place to Google's product (which was renamed and revamped as Google Shopping). Thereafter, Google Shopping appeared at or near the top of search results for comparative shopping services, and it began to appear with rich graphical features. Google Search demoted rivals' services. Even the services of rivals that were most highly ranked by the original neutral algorithm began to appear on average only on page 4. Users seldom access, much less click on, links on page 4. (The top search result on the computer page receives about 35% of the clicks; page 1 results receive about 95%; the first result on page 2 receives about 1%.) As a result of Google Search's software program change, traffic on Google Shopping increased substantially and traffic on the rivals, in spite of their merit, decreased substantially. While the Commission did not question Google's choice to display rich graphic features for the Google service at the top of the page of search results, the [\*308] Commission did question the fact that rivals could not get the same advantage. As a result of its strategy, Google Shopping increased its share in all thirteen markets in the European Economic Area, in many by a large amount.

Summarizing the changes caused by the demotions, the Commission said:

\* "Since the beginning of each abuse, Google's comparison shopping service has increased its traffic 45-fold in the United Kingdom, 35-fold in Germany, 19-fold in France, 29-fold in the Netherlands, 17-fold in Spain and 14-fold in Italy."

\* "Following the demotions applied by Google, traffic to rival comparison shopping services on the other hand dropped significantly. For example, the Commission found specific evidence of sudden drops of traffic to certain rival websites of 85% in the United Kingdom, up to 92% in Germany and 80% in France. These sudden drops could also not be explained by other factors. Some competitors have adapted and managed to recover some traffic but never in full." 31

The Commission concluded that Google abused its dominance by using its leverage in search to give its own comparative shopping service a significant advantage. The Commission found that Google had no objective justification for this conduct. It found that Google's change to prefer its own comparative shopping service was not a product improvement. Google had claimed as an improvement its addition of rich format on top of the results presented for the Google Shopping entry, but the Commission concluded that this addition could not be counted as an improvement because Google gave the embellishment to its product alone.

The Commission required Google to treat its own service equally with rivals' services. As usual, it required the undertaking to submit a plan to achieve compliance with the decision. As well, the Commission fined Google 2.42 million euros.

The case is on appeal to the European General Court. It will be judged in view of the Court of Justice's case law including the recent Inteljudgment, 32which emphasizes competitive effects. Whether a dominant firm's use of leverage to shift significant market share to itself, seriously narrowing market opportunities for competitors, violates EU competition norms will be decided on appeal. 33

[\*309]

2. U.S. Law

How would the Google/Comparative Shopping facts be analyzed under Section 2 of the Sherman Act? The jurisprudence suggests several good arguments for Google. First, market definition and market power would be contested matters. Google asserts that vertical searches are good alternatives to general search, enlarging the market so as to minimize Google's monopoly share of general search. Enlarging the market to include advertising (the paid side of the market) would likewise expand proof problems, even though Google has been labeled as dominant in online advertising with a 37% share. Second, whatever the market, Google's market power will be seriously contested, with Google insisting that it cannot and does not raise prices, reduce output, or lower quality. Third, in a similar comparative shopping case, it would be difficult for a U.S. court to find an anticompetitive abuse under Section 2 of the Sherman Act. Google is not an essential facility under U.S. law. It has no antitrust duty to deal fairly, let alone to deal at all, with firms that want to use its platform, except in rare circumstances. 34Moreover, it may be unlikely that, by reason of its demoting strategy, it acquired market power in the adjacent market (comparative shopping web services). It may be doubtful that it has power to limit output either in general search or in comparative shopping web services. As a result of the conduct, consumers/users are not confronted with a price rise, even though they do suffer a non-quantifiable loss by being given second-best information in answer to their queries, loss of the benefits of the improved performance that stronger head-on competition could bring, and loss of access to innovative products squeezed out by the demotions. (Whether the impugned conduct elevates prices charged to advertisers remains to be explored.) 35The losses, including chilling incentives of the demoted rivals, is speculative and, even if true, Google would urge that the antitrust enforcement itself chills Google's incentives to deliver innovative products. U.S. law is sympathetic to the assumption that it does. 36

The facts of Google/Comparative Shopping find parallels across the GAFA platforms. The abuse problem is probably not one of output limitation. The problem is the distortion of the market so that the firm [\*310] with power, leverage and a conflict of interests succeeds for reasons other than its merits, and the meritorious competition of rivals is suppressed.

What might the AmEx case add to the analysis? AmEx could open the door to full two-sided-market analysis, minimizing the market power and the antitrust harm. 37 AmExmakes it hard to infer market power from exclusionary effects. AmExputs a set of incumbent-preferring arguments into the mouth of Google. 38

We suggest below that the Federal Trade Commission, enforcing Section 5 of the Federal Trade Commission Act (which prohibits unfair methods of competition), could overcome the above obstacles more easily than could a court under Section 2 of the Sherman Act.

B. Facebook-Abuse of Data

1. German Law

On February 7, 2019, the German Federal Cartel Office (FCO) held that Facebook has violated the German abuse of dominance law by gathering personal data from sources beyond Facebook (e.g., every time the user clicks on "like") without the users' knowledge or permission, and using the data to compile a unique database on each user, enabling Facebook to offer advertisers distinctly targeted advertising and thus to enhance its revenues. The FCO characterized the violation as an exploitative one - Facebook exploited users, rather than excluded rivals. The appellate court, however, has suspended the FCO's order pending appeal, after expressing doubts about the legal basis for the decision. 39The following are some of the findings and analysis, as summarized by the FCO. 40

[\*311] Market, Market Power, and Dominance

Facebook is the largest social network in the world. It holds a dominant position in the German market for social networks, having more than a 90% market share. It has 2.3 billion active users worldwide, with 1.5 billion using Facebook daily. Facebook users in Germany number some 323 million monthly and 23 million daily. As to competition in Germany, Facebook faces only some small German providers, and their suitability as an alternative social network is limited in view of Facebook's economies of scale and network effects.

The FCO expressly based the assessment of market power on more than market share. It referenced recent amendments to the German Competition Act to include as indicia of market power: "competitively relevant data, economies of scale based on network effects, the behaviour of users who can use several different services or only one service and the power of innovation-driven competitive pressure ... ." 41Identity-based direct network effects were deemed an important factor in assessing Facebook's market power. Also important were indirect network effects stemming from advertiser-financed services: the larger the user base, the more audience for ads and the more profits to advertisers. Economies of scale that produce cost-savings "provide Facebook with a far greater scope for strategic decisions than its competitors have." 42Facebook invoked multi-homing as a countervailing force, but the FCO found the contention not established. Moreover, the FCO found: "Facebook has superior access to competition-relevant data, in particular the personal data of its users. As social networks are data-driven products, access to such data is an essential factor for competition in the market." 43Lack of access to data "can be an additional barrier to market entry." 44

The Harm to Competition

The FCO found that Facebook imposes exploitative business terms. "The damage for the users lies in loss of control: They are no longer able to control how their personal data are used. They cannot perceive which data from which sources are combined for which purposes ... ." 45Facebook "violates the constitutionally protected right to informational self-determination." 46Further competitive harm is caused to advertising customers, who are faced with a dominant supplier of advertising space in social networks.

[\*312] In finding an exploitative abuse, the FCO drew on contract principles and data protection principles, importing their values into antitrust analysis. Reference to the General Data Protection Regulation, the FCO said, helped to confirm Facebook's lack of justification for exploiting users' data. The FCO recognized Facebook's legitimate interests in processing the data, but found that the legitimate interests did not outweigh the harm to users' interests.

Facebook's Conduct Poses a Competition Problem

The FCO said that access to market data is essential to the market position of social network companies. "Access to data, above all in the case of online platforms and networks," 47is specified as a relevant factor for dominance by the German Competition Act. "Monitoring the data processing activities of dominant companies is therefore an essential task of a competition authority, which cannot be fulfilled by data protection officers." 48

Remedy

The FCO imposed no fine. Its aim was to change behavior. Facebook was required to submit a plan for compliance.

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The German Federal Ministry for Economic Affairs and Energy is further studying digital platforms and abuse of market power to determine whether modernization of the law is necessary. An expert committee issued a report, 49and a follow-up committee is tasked to suggest means to implement the initial report.

European Competition Commissioner Margrethe Vestager, while studying the report, noted "the importance of monitoring data monopolies and internet gatekeepers that can choke off data access to rivals." 50Moreover, the Directorate-General for Competition commissioned its own report. 51Meanwhile, a new Commission has been constituted. Vestager has not only been reappointed the Competition Commissioner, she has been appointed Executive Vice President for the EU's digital policy.

[\*313]

2. U.S. Law

Abuse in the collection and use of data, especially by the big data companies, is a big concern in the world. The abuses and their remedies are being studied in many jurisdictions in addition to Germany and the EU, including Australia, Japan and the UK.

Section 2 of the Sherman Act offers no parallel application to the German case. In the United States, a plaintiff would face difficulties at the outset in defining the market and proving monopoly power. But more basically, the claim of violation by abuse of data collecting, including from third party sites, and collecting and using the data surreptitiously and deceitfully, does not fit with the U.S. antitrust laws. The Sherman Act imposes no special responsibility, not even on a monopoly firm, to have regard for rivals or users. The right to refuse to deal (or to deal on chosen terms) is strong. Moreover, the German Facebook violation is an exploitative violation, not an exclusionary one, and Section 2 does not prohibit exploitative behavior (e.g., excessive prices). 52The German Facebookproceeding did not include exclusionary practices. Such practices, alleged elsewhere, include Facebook's cutting off user access to an improvement by Vine, a video-creating and sharing platform, apparently because Facebook took the Vine product to be a competitive threat to it. 53

Might lessons from AmExplay a role in the analysis? Let us postulate that consumers, including business users, are harmed on one side of the market. Their valuable data is coerced from them, aggregated from third party sources, and monetized lucratively. The social network charges zero (plus the data) to users and sells curated space to advertisers, making possible the zero user-charge. AmExand other decisions would counsel to count positively Facebook's efficiencies in data use and improvement of its services though collection and use of its data trove.

The FCO did consider the advertiser side of the market. It concluded that Facebook exploited advertisers as well as users. It did take note of efficiency benefits through increased accuracy of advertisers in targeting likely buyers, and benefits of the network's declining marginal costs, but it counted those advantages as contributors to Facebook's power, not as contributors to the public's or consumers' welfare. The FCO determined that the users' interests outweighed Facebook's interests. It so concluded not because, if monetized, the [\*314] Euro-amount of the gains to Facebook was less than the Euro-amount of the losses to users, but on quasi-constitutional grounds: people have a right to control their data and to know how it is going to be used; it was wrong for a dominant firm to coerce users to give up their data rights if they were to use Facebook's service at all.

While Section 2 of the Sherman Act has strict limits, Section 5 of the FTC Act is a more flexible vehicle. The FTC is not bound to ignore a problem just because Facebook's conduct may be exploitative rather than exclusionary or just because it interfaces with data privacy. Moreover, the FTC has consumer protection powers and Facebook's behavior raises serious consumer protection concerns. Indeed, the FTC already has a file on Facebook and has just penalized Facebook $ 5 billion for sharing with Cambridge Analytica, a political consultant to then-candidate Trump, data of 87 million Facebook users, which it used to compile voter profiles. 54If a data privacy problem is mixed with a consumer protection problem and possibly an antitrust problem (e.g., an abusive cut-off of access, or an anticompetitive acquisition), the FTC is well placed to consider the abuses together for whatever synergies may be mined. If vested with the multi-faceted matter, the FTC could consider formulating some rules and controlling principles, such as banning self-dealing and disallowing efficiency as a defense to coercion and deception.

C. Start-Ups: Nipping Competition in the Bud

Major platforms such as Facebook, through their massive data troves collected in part from the targets themselves, are well positioned to identify the promising start-ups that pose the greatest competitive threats to the platform, and buy them up or stamp them out. Because the start-ups typically lack significant revenues, the acquisition may be below the turnover thresholds required for premerger filing in some jurisdictions. Moreover, any single such acquisition may just be ignored as too insignificant.

Competition authorities in several jurisdictions are considering the need to be tougher on dominant platforms' systematically buying their most promising and threatening would-be rivals. Germany has revised its merger control thresholds to add a value-of-the-transaction test and to include debt as part of value, so that these rising-star start-ups do not escape assessment. 55The most commonly cited examples [\*315] of allegedly anticompetitive "snap-ups" is Facebook's acquisitions of Instagram and of WhatsApp, both of which platforms provide important alternatives for social network users seeking a model friendlier to younger users.

The future of such start-ups may be highly speculative at the time of acquisition. But what if, as it has been alleged, the dominant platform either buys up or stamps out all potentially threatening start-ups to preserve its dominance? The tale of Snapchat may be a cautionary one. Facebook pursued Snapchat. Snapchat said no. Then Facebook appropriated Snapchat's signature innovation: stories - a photo and video post-platform. The story is told in Facebook is Killing Snapchat with the Format It Created. 56

The big data strategies are reminiscent of tales of the Standard Oil Trust. By some reckoning the conduct may be called efficient. So was Standard Oil's conduct, as insisted by historian John S. McGee. 57But the efficiencies of Standard Oil's strategies did not prevent the giant predatory trust from being Exhibit A to the very enactment of the Sherman Act and did not dissuade the Supreme Court from breaking it up. 58

There are several big challenges to thwarting the so-called "killer acquisitions." One is to be able to identify the anticompetitive qualities of the acquisition at the time of vetting. The second is this: suppose the acquisitions are indeed harmful to competition today. It is possible under existing U.S. antitrust law, although not common, to obtain divestiture of assets whose acquisition turned out to be anticompetitive. The challenge, however, is to prove both that the consolidation is on balance anticompetitive (in spite of efficiency aspects such as better use of data), and that divestiture will noticeably produce competition and make consumers/users better off. Third, the possibility of sale to the dominant platform has been an incentive for start-ups to start up in the first place. One would want to be able to predict that the loss of this route to "success" would not cause more harm than good.

[\*316]

V. PROPOSALS

The "do nothing" and the "break them up" approaches are extreme policy approaches that at the one end would leave real competition problems unaddressed and at the other would apply blunt instruments to cure huge state-of-the-world dilemmas that pose daunting implementation problems and are sure to leave unfilled expectations in their wake.

There are three reasons why the United States might wish to take Europe's big data initiatives more seriously. First, European competition law is the law in a substantial part of the world. If the U.S. wants to be relevant in international transactions, it must appreciate European perspectives. Second, top down regulation is a possible substitute for antitrust. If the antitrust agencies ignore abuses of economic power that people care about, more intrusive regulation is likely to fill the gap. European competition policy gives some insight into how antitrust, complemented with consumer protection and privacy protection, can be an alternative to more intrusive regulation. 59Third, Europe may be right in some not insignificant ways.

We focus on the third point. Europe may be right. We address the skeptics who insist that there is no competition problem and that, if there is, it cannot be solved except by remedies that are worse than the disease. Is there a competition problem? Let us return to the three problems analyzed: (1) the Google/Comparative Shopping problem; (2) the German Facebook problem; and (3) acquisitions by dominant platforms of potentially threatening start-ups. Starting with the last, it is now recognized that the acquisitions of nascant competitors might be anticompetitive. If so, they are fair game for divestiture - if divestiture will indeed produce the desired competition. Going forward, these acquisitions should be vetted more seriously.

There is a philosophical divide between those who want to give more breathing space to even dominant platforms to buy promising start-ups whose futures are speculative, and those who are alarmed that the platforms are snapping up all threatening startups and are thereby insulating themselves from the competitive forces that could make them accountable. 60These are the usual philosophical tugs and play out with little fanfare (or get submerged) in the course of technocratic merger review.

The middle category - the German Facebook case - is largely a problem of deception, privacy invasion, and exploitation of people who [\*317] provide their data. While the German FCO was able to blend the several disciplines, the underlying problem treated in the German Facebook case is not likely to be seen as an antitrust problem in the United States.

We come, then, to category number 1: gatekeepers abuse the users of their platforms who compete with them, systematically downgrading the rivals, sabotaging their inventions, and appropriating their ideas to outcompete them. How to define the market, how to assess market power, how to identify an abuse as anticompetitive, and how to devise a remedy are all contested issues. In part, the divide is ideological. Do we stress that Google (for example) created its platform, conclude that it should be able to use it as it likes, and assume that legal duties will handicap invention? Or do we highlight Google's conflict of interests and observe that downgrading often-better rivals is inefficient as well as unfair? Do we emphasize that clogging the path to market interferes with the competition process, chills the incentives of the platform users, and defeats expectations of consumers, who expect best answers to their queries? In this late day of the political economy debate, the divide will not be closed by evidence or economics. The popular sentiment, however, tends to coincide with the concerns about power, its abuse, and the unaccountability of the dominant platforms. 61

Here are six suggestions for U.S. law, based on this author's perception that the big data antitrust abuses are real and pressing:

1. Recognize that the dominant big data platforms have economic power sufficient to cause competitive harms. When conduct of a dominant platform has demonstrable anticompetitive qualities, we should simplify the proofs of power and effects and get quickly to the question of procompetitive justifications. 62Anticompetitive qualities include clauses and conduct to frustrate multi-homing, interoperability, and data portability. If the platform engages in conduct to raise rivals' costs, to make alternatives infeasible, or to marginalize rivals, the burden should shift; and if defendants offer no credible procompetitive [\*318] explanation or justification, the conduct should be prohibited. The Federal Trade Commission is well situated to do this job. 63

2. Much conduct is likely to require deeper study of pros and cons. The FTC should examine the practices, listen to the justifications, and judge the conduct. It should not be required to prove that the platform's conduct will lessen output in the relevant market as a condition precedent to finding an offense. Output limitation is not the problem. To clarify the law, the FTC might write rules under its rule-making authority.

3. In the case of a dominant platform that also hosts its own services on the platform, the gatekeeper has a conflict of interest. The FTC should seriously consider establishing a duty of dominant platforms to treat all firms that are rivals on the platform (including its own) neutrally. As a first step the FTC should require the platform either to announce clearly regarding search query returns: "You are advised that we give preference to our own product" 64or to offer neutral, merit-based treatment. This can be done immediately. Writers and implementers of the algorithm should be rewarded on the basis of the system's performance, not on the basis of the platform's own products' performance.

4. More research should address the efficiency and innovation properties of a dominant platform's duties of fair dealing. Framed differently: Do we get more, and more dynamic, innovation (1) in a world in which the dominant platform has no antitrust duties to those who use its platform in competition with it, or (2) in a world in which the platform has the duty of neutral treatment?

5. Strategies of dominant firms to nip emerging competition in the bud by preemptive strike acquisitions should be taken seriously. 65 Anticompetitive acquisitions of start-ups should be [\*319] prohibited under the merger laws. Strategies of dominant firms to nip competitors in the bud should be prohibited as monopolistic conduct.

#### That staves off an impending regulatory state power transition---global war.

Lavenex et al. 21, Sandra Lavenex, Department of Political Science and International Relations, University of Geneva; Omar Serrano, Global Studies Institute, University of Geneva; Tim Büthe, Hochschule für Politik München and School of Governance, Technical University of Munich, “Power Transitions and the Rise of the Regulatory State: Global Market Governance in Flux,” Regulation & Governance, vol. 15, no. 3, 2021, pp. 445–471

We are in the midst of a power transition in the world economy with possibly profound implications for the governance of global markets (see, e.g. Stephen & Zürn 2019). For more than two centuries, either Europeans or Americans, or both together, have been the global regulators, largely determining the rules for international commerce, even as commerce became increasingly global. Today, the predominance of the EU and the United States in global markets is called into question by the rise of emerging powers, above all Brazil, India and, especially, China (BIC). Twenty years ago, these three countries, while of course already very large, were still mostly poor and generally considered technological followers – and therefore no more than rule-takers in the governance of the global economy. In the meantime, they have escaped the persistently poor macroeconomic performance and weak growth, which was always economically puzzling (Lucas 1990) but for a long time seemed to permanently entrap many countries in the developing world. Today, Brazil, India, and China, even with only “middle income” per capita incomes, are among the 10 largest economies. They are poised to play an even greater role in the governance of global markets in the years to come – all the more so given that the reliability of U.S. commitment is much less certain after ex-President Trump effectively abdicated global leadership, and given that the EU's market power has been weakened by Brexit. In addition, middle powers such as Mexico, South Korea, and Turkey have increased their market share, especially within their respective regions.1

Are these rising powers a threat to the international order? Whereas the more strictly economic aspects of this power transition in the world economy have received much attention, the political aspects are less well understood. The rise of these “emerging countries” has gone hand-in-hand with their increasing integration into the world economy (and in many industries a move up the “global value chain”; see Gereffi & Sturgeon 2013), thus giving them an increasing stake in the rules for global markets. Yet, we know relatively little about whether the increases in BIC's share of global markets fundamentally challenges the regulatory predominance of the EU and the United States, under what conditions this might occur, and with what consequences for the international order. What will be the effect of such major shifts in the world economy for global economic governance?

The papers in this special issue analyze those consequences for specific countries and specific regulatory issues, based on the assumption that the regulatory preeminence of Europe and the United States has been based not just on economic predominance, but on the political choice to create conducive political institutions, especially the regulatory state. The regulatory state entails, inter alia, horizontal decentralization and diversification of regulatory policymaking to meet the demands of ever more transnational economic relationships (Levi-Faur 2011, 2013). It also is necessary for translating economic power into international influence (Farrell & Newman 2014).

The variation in the institutional strength of the regulatory state – across countries, regulatory issue areas, and over time – is a key component of the Power Transition Theory of Global Economic Governance (PTT-GEG), which we develop in section 2 to explain the behavior of rising powers vis-a-vis global regulatory regimes. Here, we start from a sympathetic critique of power transition theory (PTT) as originally developed by Organski (1958b). We thus take as our point of departure the key insight of the PTT literature that major shifts in the distribution of resources among countries that regularly interact with each other pose risks for the established rules governing political and economic relations and more generally threaten the prevailing international order. Such risks should be particularly high when the transition entails the rise of entirely new players into the ranks of those who are able to disrupt (and who are therefore needed to maintain) the international order. At the same time, critics of structural realism have long pointed out that the mere existence or possession of power resources will only under the most exceptional circumstances determine what a country does with those resources and what the larger consequences are (e.g. Keohane 1986; Baldwin 1993; see also already Wolfers 1962, pp. 13–15). Similarly, we should not simply assume that an increase in power resources by itself determines how a rising power will use them. Domestic politics usually drives institutional and policy choices, including foreign economic policy, at least as much as international factors (Milner 1988; Simmons 1994). We therefore modify PTT to address such critiques. Specifically, we emphasize variation in the institutional strength of the regulatory state – conceptualized as a function of regulatory “capability” (Cafaggi & Pistor 2015) and “capacity” (Bach & Newman 2007). We propose that the strength of the regulatory state is the key conduit through which the growing economic resources of the emerging economies may give their governments leverage in global regulatory governance if, for a particular regulatory issue, they make the political choice to invest in building such capacity and capability.2 And, rather than assume that rising powers' substantive policy preferences necessarily and uniformly conflict with the regulatory status quo, we emphasize variation in the extent to which rising and established powers' preferences diverge.

PTT-GEG emphasizes regulatory capacity and capability on the one hand and preference alignment/divergence on the other as the key determinants of the consequences of the recent power transition in the global economy (along with the reaction of the established powers). This focus of theory in turn raises the question of where those institutions of the regulatory state and where those preferences come from. We turn to these questions in section 3, examining the domestic and the international drivers of regulatory state formation and substantive preferences regarding the content of regulations. The papers in this special issue provide an in-depth evaluation of the sectorally differentiated domestic and international political-economic context in which economic regulation unfolds. Taking up Dubash and Morgan's (2012, p. 275) call in this journal to “turn to politics” when analyzing “The Rise of the Regulatory State in the South,” the contributors to this special issue emphasize elite preferences, interest groups and domestic regulatory structures as well as transgovernmental ties and transnational advocacy networks. And they evaluate the convergence or divergence between the evolving domestic regulatory preferences and the established powers' preferences, as enshrined in existing international regulatory regimes. Finally, they analyze established powers' incentives to accommodate demands for change if preferences differ, thereby specifying the conditions under which power transitions lead to the transformation of regulatory regimes.

Our special issue and the analytical framework presented in this introduction seek to contribute to several, often multidisciplinary literatures. For the literature on the governance of global markets, we develop a set of hypotheses about the consequences of major changes in the distribution of economic power resources – hypotheses derived from PTT and the IPE/CPE literature on the regulatory state. This allows us to specify the conditions under which such changes will lead to conflict and/or breakdown in the global order – and the conditions under which such changes might result in substantially strengthened global regimes or barely perceptible change.

With their sectoral focus, the articles in the special issue furthermore contribute to specific regulatory politics literatures, for example, on the governance of intellectual property, labor mobility, market competition (antitrust), public procurement, and trade finance. We also expand the analysis of regulatory policy transfer and policy diffusion (e.g. Marsh & Sharman 2009; Lavenex 2014; Maggetti & Gilardi 2016; Lavenex et al. 2017) to the case of emerging economies.

In addition, our theoretical framework and the empirical analyses in this special issue contribute to several broader literatures. We contribute to the literature on power transitions through a constructive critique of the theory and an extension of the scope of this analytical perspective by developing PTT-GEG. Importantly, the variation in initial conditions across the different regulatory governance issues (as well as across countries and over time) affords us the kind of analytical leverage that has escaped traditional empirical analyses of PTT due to their singular focus on military security. Relatedly, we make PTT useful for understanding conflict and cooperation more generally, as our modified PTT framework can explain five quite distinct ideal-typical possible outcomes of the ongoing power transition in the world economy.

We also contribute more generally to the literature on emergent economies and rising powers (e.g. Armijo & Roberts 2014; Harris 2014; Stephen 2017; Kruck & Zangl 2020). Here, we move beyond the dichotomies, for which Mahrenbach (2018) has rightly criticized much of the literature on emerging powers. We reject, in particular, the assumption that rising powers are necessarily “dissatisfied” with all the rules governing the world economy – and the related assumption that it should be possible to classify a given rising power, across all issue areas, as being revisionist or status quo-oriented. Instead, we turn both preference divergence and the institutional strength of the state into issue-specific variables. PTT-GEG thus offers a framework for moving beyond simply treating the BRICS (Brazil, Russia, India, China, and South Africa) countries (or even just BIC) monolithically, without going to the other extreme of assuming that China is sui generis or the sole concern for global order.3 We will draw out some key policy implications of this aspect of the PTT-GEG framework in the conclusion.

Moreover, the PTT-GEG framework contributes to the “new interdependence approach” (Farrell & Newman 2014) by highlighting the interplay between domestic regulatory structures and international cooperation venues. Specifically, we examine how domestic institutional politics – including “judicial norms, regulatory oversight, the organization of the executive” (Farrell & Newman 2014, p. 339) – enable and sustain (or constrain) the development of regulatory capacity and capability. And we draw attention to the ways in which these domestic changes, together with the constellation of state preferences, affect international power relations and the (in)stability of the international order.

Finally, by providing issue-specific accounts of the institutional development of – and challenges to – the regulatory state across different types of developing countries (the BIC and three middle powers), this special issue as a whole also contributes to the literature on institutional legacies and institutional development (Fioretos et al. 2015; Mahoney & Thelen 2015; Rixen et al. 2016; see also Büthe & Mattli 2011), for example, by allowing for novel comparisons across regulatory issue areas.

2 The consequences of power transitions for regulatory regimes: Explaining conflict and cooperation in global economic governance

2.1 Power transitions and their consequences

The implications of the recent and ongoing shift in economic power for the international order are hotly debated but poorly understood. Scholars in the Realist tradition of international relations (IR) often expect a linear relationship between economic power and international influence (Drezner 2007; Xuetong 2011). Historical institutionalist scholarship across a wide range of issues and countries, however, suggests that the smooth, quasi-automatic adjustments of global governance institutions, implied by such arguments, are unlikely and should not be simply assumed. How might we think more systematically about this power transition in the global economy and its consequences for global economic governance?

Organski – who already in the late 1950s predicted that the full integration of an industrialized China into the world economy would upset the international order as much or more than the Soviet Union's rise to superpower status in the early 20th century – was the first to explicitly theorize “power transitions” and their effect on the international order.4 Organski defines an international “order” as a stable “pattern of behavior” based on “rules of trade, diplomacy, and war” (Organski 1958b, p. 316).5 And he defines a “power transition” as a major and “abrupt” shift in the “distribution of power among nations,” where a country's power is understood to be largely a function of its population, the degree of industrialization (as the key determinant of the population's productive capacity), and the effectiveness and efficiency of political institutions (Organski 1958b, p. 300f; see also Organski 1958a, 1968).6 The theory is thus based on a (relative) resources concept of power (see Organski 1958b, p. 305), with high assumed fungibility across issue areas.7

Importantly, Organski does not assume power resources to be static. Instead, PTT emphasizes that industrialization can result in increases in an emergent country's power resources. Such increases are endogenous insofar as countries can launch this process and drive it forward on their own initiative.8

The often rapid increases in the emergent country's relative power almost inevitably results in conflict, according to PTT. The main reason is that rising powers are expected to seek “a new place for themselves in international society, a place to which they feel their growing power entitles them” (Organski 1958b, p. 328). This necessarily creates a conflict of interest vis-à-vis the established powers, given that the existing order is assumed to institutionalize the established powers' privileged position. Resolving it would therefore require pro-active accommodation and in that sense cooperation (Milner 1992, pp. 468–470) – which, however, PTT considers highly unlikely.

Part of the problem may be attributed to the rising powers: In an under-theorized and rather anthropomorphic passage, Organski attributes to rising powers impatience and hubris due to a tendency to overestimate the increase in their own power (Organski 1958b, p. 335f). Gilpin in his closely related version of hegemonic stability theory (Gilpin 1981, 1988) goes even further in expecting conflictual behavior from the rising powers, as discussed below.

The most important reason, however, why conflict is very likely, according to PTT, is the unwillingness of the leading established power(s) to accommodate the rising power, given that the established power(s) feel threatened by the emergence of a new great power – symbolically, politically, and economically. Politically and symbolically, leading powers' privilege is assumed to be institutionally entrenched, allowing them to benefit from refusing or at least delaying “anything more than a small part” (Organski 1958b, p. 328) of the change needed to bring political voice opportunities and influence in line with the new (post-transition) international distribution own power.9

Notwithstanding the fundamental conflict of interest, which in PTT often appears inevitable, Organski repeatedly notes that it is possible that the previously preeminent power(s) may accommodate a rising major power, allowing the latter to “shar[e] in the leadership of the … international order and in the benefits that flow from it” (Organski 1958b, p. 327). It even is possible that such a “challenger” becomes the new “dominant” power in such a way that the existing order fundamentally prevails (Organski 1958b, pp. 323ff, 332f).10 Such confirmatory accommodation, however, is considered very unlikely, especially when a major power has “recently risen in power thanks to industrialization” (Organski 1958b, p. 323). Under any but the most unusual circumstances,11 a major shift in the global distribution of wealth and power is expected to lead to escalating conflicts of interest – to the point that “one could almost say that the rise of such a challenger guarantees a major war” (Organski 1958b, p. 323).12

### 1AC---Plan

#### Plan: The United States federal government should limit anticompetitive mergers through the application of a presumption against potential competition mergers in the technology sector.

### 1AC---Solvency

#### The plan inaugurates a revitalized presumption against the technology sector with regard to mergers.

Mark Glick et al. 21, Professor of Economics, University of Utah; Catherine Ruetschlin, Assistant Professor of Economics, University of Utah; Darren Bush, Leonard B. Rosenberg Professor of Law, University of Houston Law Center, "Big Tech's Buying Spree and the Failed Ideology of Competition Law," Hastings Law Review, Vol. 72, No. 465, 2021, Lexis.

Introduction

Big Tech dominates the technology sector in the American economy. Five technology firms - Google, Amazon, Apple, Facebook, and Microsoft - claim the top five spots on the NASDAQ by market capitalization. And Big Tech is hungry for more. All five companies are buying smaller companies at an unprecedented pace. Google has acquired 270 companies since 2001, including Android, YouTube, and Waze. Microsoft has made over 100 acquisitions in the last ten years, including acquisitions of Skype, Nokia Devices, LinkedIn and GitHub. Amazon has made a similar number of acquisitions, including its purchase of Whole Foods. Facebook has acquired ninety companies, mainly startups.

A growing chorus of commentators have argued that Big Tech's appetite for expanding through purchasing other companies provide a potential means for these dominant firms to solidify and protect their dominance. While we do not determine whether any particular merger was anticompetitive, this Article, relying exclusively on public information, joins that chorus but adds a new twist. It argues that existing law of mergers is ill-equipped to address the tech firms' acquisition of startups because of a rule called the "potential competition" doctrine. The potential competition doctrine addresses the effects of an acquisition where one firm is in the market and the other is "waiting in the wings" or on the periphery of the market.

The problem with the potential competition doctrine, we argue, is its extraordinarily high burden of proof. That burden can be traced back to Justice Powell's opinion in United States v. Marine Bancorporation. The Marine Bancorporation case imposed an extravagant evidentiary burden for a violation of § 7 of the Clayton Act based on elimination of potential competition. Decades later, that standard has gutted the proper role of competition law and rendered it effectively inapplicable to today's mergers in digital markets. A dramatic rethinking of the doctrine is needed to enable federal antitrust enforcement agencies to protect consumers.

In this Article, we explore how the proper use of potential competition doctrine might have halted the transactions that have led to massive Big Tech. We begin by examining the history of Facebook's acquisition strategy and how [\*468] it could have contributed to Facebook's rise to dominance and the maintenance of its dominance.

Facebook and other Big Tech companies maintain their market dominance by harnessing the network effects that reinforce user value in the consumer-facing market and advertiser benefits in digital advertising markets. Startup firms provide competitive pressure because they are able to siphon off or "cream skim" customers and collect valuable data. Big Tech acquisition of startup companies may benefit the incumbent by reducing competitive pressure of potential entrants on the periphery of the market or by preventing future entry and expansion by such firms that could undermine the incumbent's dominance.

Such acquisitions are typically analyzed under the potential competition doctrine. In the next Part, we discuss how the Court transformed a once workable standard into a completely unworkable, open-ended prediction of future conduct and performance that could not be practically discharged. We discuss how the Court split the doctrine in two, creating the actual potential competition doctrine and the perceived potential competition doctrine, each with different evidentiary requirements. It ultimately expressed disdain over one of the doctrines it created, suggesting that no plaintiff could meet such a standard.

We then discuss, using public information, the competition harm story of Facebook's acquisitions of Instagram and WhatsApp. In each Part, we detail why antitrust enforcement agencies failed to challenge mergers. We then describe why the potential competition doctrine as currently applied would lead to a false negative; namely, an acquisition that is competitively harmful yet not challenged by federal antitrust enforcement agencies. The high initial burden on the plaintiff to present a case concerning future conduct and competitive effects serves as a serious deterrent to potential competition mergers, even by dominant firms.

In the next Part, we seek to alter the potential competition doctrine. Using the 1968 Merger Guidelines and additions from the potential competition literature, we assert that with simple structural presumption, the Federal Trade Commission (FTC) could have elected to challenge these mergers and shifted the burden to Facebook to demonstrate why no harm to future competition could occur, and why, given Facebook's resources it could not internally innovate to achieve its competitive goals.

I. Facebook's History of Acquisitions of Small Potential Competitors

Big Tech firms operate in online platform markets where they provide critical facilitation services between buyers and sellers, users and content providers, and advertisers and consumers. Their services include search [\*469] engines, social networks, ecommerce, digital advertising, app stores, and operating systems, where platforms connect parties online to facilitate transactions. The increased functionality and speed of the internet has made platforms exceptionally efficient in connecting end users. The tremendous profits earned by these firms create strong incentives for others to enter these markets, yet two or fewer Big Tech firms have dominated many of these markets for years. Some observers contend that the Big Tech large-scale acquisition programs have diluted the natural process of competitive entry, with firms entering the market with the sole intent of being acquired, as there would be no other plausible endgame.

Online platforms typically operate in two-sided markets including a consumer-facing market for digital services and a market for online advertising. In order for a platform to maintain its position in both the digital services and the online advertising markets, it must maintain the most desirable platform for users and prevent users from switching to other platforms. In other words, user traffic is important to both markets because they each exhibit strong network effects. In social networking, for example, users value the social network with the most opportunities to reach others; advertisers benefit from [\*470] greater user numbers in terms of reach and consumer targeting. Such direct and indirect network effects have resulted in Facebook becoming a dominant provider. Once a dominant firm establishes itself in an online platform market, the network effects and data-driven efficiencies in digital markets tend to reinforce dominance even when new rivals improve or produce novel products.

While strong network effects can cause markets to tip and create a dominant firm, they can also allow small nascent competitors with a desirable alternative platform to scale quickly and challenge such dominance. Innovating startup firms provide competitive pressure in such markets when they exhibit rapid user growth and the potential to enter the dominant firm's core market. Prior to entry into the core market, these nascent firms demonstrate their potential by diverting users from the dominant platform or acquiring data that would be valuable on the advertising side of the market. This information provides a signal to the dominant firms, creating an incentive to absorb or eliminate the nascent rival. A nascent competitor can improve the economic performance of the market overall by preventing a dominant firm from reducing quality, raising prices, or curtailing innovation. The nascent startup that blossoms into a competitive rival can reinvigorate the competitive process within the dominant firm's core market. In this context, acquisitions of nascent competitors by dominant firms undermine both current and future competition, reinforcing the incumbent's dominance in the face of technological shifts.

[\*471] Facebook's record demonstrates how acquisitions can play a critical role in the rise to dominance and the maintenance of dominance by a Big Tech incumbent. At the time of Facebook's launch in 2004, the social media market was highly competitive, with multiple new social networks emerging each year. Facebook's famed beginnings in a Harvard dorm room filled a new niche in the social networking market. The site opened exclusively to the Harvard community - requiring a Harvard.edu email address to join - before extending services to Stanford, Columbia, and Yale. The interface was simple, providing a few core social networking functions, including profile pages where users could post a single photo and personalized information, as well as a "friend graph" or database of connections between individuals that could be searched via user names or other attributes to identify and request new connections.

The site was immediately popular and each new user added to its overall utility as more friends or potential friends joined the network. Despite its limited Ivy League user base, by December 2004 the site had grown to one million monthly active members. Its popularity drew the attention of funders. Funding drove expansion, first to more universities, then high schools, then workplaces, and finally in September 2006 to anyone in the world. By the time Facebook was opened to all people willing to register, the company had already received more than $ 40 million in angel and venture capital investments. This funding enabled the company to pursue an ambitious growth strategy, including early acquisitions, which made it possible for the company to take advantage of economies of scale and scope and network effects in the social networking market.

Social media use grew rapidly in the years of Facebook's early expansion. According to survey data from the Pew Research Center, just 7% of U.S. adults participated in social networking in 2005. Over the following decade, that number would rise to 65%, with the fastest growth occurring before 2011. Facebook positioned itself to take advantage of this market growth by expanding its user base, articulating a qualitative product differentiation between itself and [\*472] its competitors, and integrating new ways of engaging users into its suite of social networking functions by offering new features and functionalities.

Facebook operated in a rapidly changing competitive environment where the basic technological undergirding of the social network was evolving, including the increasing importance of mobile technology to connect users online. Beginning in 2007, the company initiated a series of acquisitions of both its potential rivals in the social media market and firms in adjacent markets that could divert user engagement away from the social network. This tactic arguably propelled Facebook's growth strategy as the company overtook its main competitors. Figure 1 shows the number of acquisitions Facebook completed each year from 2004 to 2018, as well as the number of monthly active users reported by the company each year.

Figure 1

Partially as a result of Facebook's acquisition strategy, when market user growth leveled off, competitors like MySpace, Windows Live Spaces, and [\*473] Google's Orkut suffered significantly, while the number of new users active on Facebook each year continued to measure in the hundreds of millions. Facebook first surpassed its main rival, MySpace, to become the most popular website in the United States in 2009, just five years after its founding. By 2011, when more than half of all adults and two-thirds of internet users were regular users of social networks, Facebook dominated the industry by a wide margin. Pew Research Center data from 2011 showed that while 92% of social network users regularly accessed Facebook, just 29% utilized the nearest competitor, MySpace, while 18% used LinkedIn and 13% used Twitter.

From 2007 to 2018 Facebook acquired or attempted to acquire more than 100 companies in competing and adjacent markets. The ninety acquisitions completed since the company's founding, and documented in the Appendix, range from small acquisitions like the $ 2.5 million purchase of location services network Nextstop to the $ 19 billion acquisition of popular instant messaging rival WhatsApp in 2014. They include deals that transferred key technology and expertise to the company in markets for app development platforms, instant messaging, photo sharing, location services, user information and surveillance, and advertising and analytics. Many of the acquisitions converted stand-alone apps, websites, and platforms that worked inter-operably across competing [\*474] networks into Facebook-exclusive features. Other products were simply shuttered in the days or months following their acquisition.

Today, Facebook is number three on the list of most-trafficked websites in the world. With Instagram, Messenger, Facebook, and WhatsApp, the company now owns four of the most popular mobile apps in the United States. Facebook is responsible for about ten percent of the mobile browser market, representing a substantial share of mobile users for whom Facebook is the main point of entry for online content. This remarkable influence over how individuals engage and consume online is the product of over a decade of strategic internal growth, as well as the acquisition of potential competitors and the integration of their user traffic and functionality within the Facebook structure.

Remarkably, Facebook's ascendancy in concert with its numerous acquisitions stimulated little interest by the antitrust agencies. A march to dominance, accompanied by numerous acquisitions of potential competitors, puts Facebook's strategy directly within the merger regulatory power of the government through its ability to enforce § 7 of the Clayton Act. Yet, few of [\*475] the acquisitions faced review from antitrust authorities in the United States. In 2012, the FTC conducted a nonpublic investigation of the $ 1 billion Facebook-Instagram merger and did not recommend any further action. In 2014, U.S. regulators cleared Facebook's $ 19 billion acquisition of the messaging application WhatsApp, though the FTC did send both companies a letter reminding them of their obligation to maintain privacy practices in accordance with the WhatsApp user agreement in place at the time that user data was collected.

Unlike many other companies acquired by Facebook, Instagram and WhatsApp remained separate from Facebook's social network in branding until 2019, and in some features of interoperability and data autonomy. They are also globally important market leaders in social networking, photo sharing, and instant messaging. The scale, innovation, and popularity of these products have made them frequent examples of potential competitors both at the times of the acquisitions and in the years since.

The question arises why the federal antitrust enforcement agencies demonstrated reluctance to seriously confront the competitive impact of these and similar mergers among high tech companies. We argue below that the potential competition doctrine, as developed during the years of the influence of the Chicago School of antitrust, has played an important role in insulating acquisitions of startups by the dominant tech companies from the levels of antitrust scrutiny necessary to protect consumers and the competitive process in technology markets.

II. The Potential Competition Doctrine

Facebook and other Big Tech companies maintain their market dominance by harnessing the network effects that reinforce user value in the consumer-facing market and advertiser benefits in digital advertising markets. Innovative startup firms provide competitive pressure in these markets despite the tendency toward tipping when small firms exist that have the potential to rapidly siphon off users to more desirable or innovative platforms, collect valuable data on end users, or both. In this context, the acquisition of startup companies may benefit the dominant firm by reducing the disciplining competitive pressure of potential entrants on the periphery of the market or by preventing future entry and expansion by such firms that could undermine the incumbent's dominance. Under the common law of antitrust, an acquisition of a potential entrant is [\*476] analyzed under the potential competition doctrine. Thus, to understand the ability and potential to regulate acquisitions by dominant tech firms it is important to understand how the law of potential competition mergers developed and why it has been so underutilized to date.

The history of the potential competition doctrine informs the analysis of tech industry acquisitions because it demonstrates how a shift in the standard of analysis beginning in the 1960s and culminating in the 1974 United States v. Marine Bancorporation decision undermined the applicability of the doctrine in a range of contexts including online platform markets. The potential competition doctrine emerged in the aftermath of the 1950 Amendment to § 7 of the Clayton Act. As described by the Supreme Court in Brown Shoe v. United States, the "dominant theme pervading congressional consideration of the 1950 amendments was a fear of what was considered to be a rising tide of economic concentration in the American economy." In 1963, the Supreme Court, in United States v. Philadelphia National Bank, explained that the "intense congressional concern" about increasing concentration "warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects."

Under this standard, expectations of the market-disciplining effects of potential competition operated to preserve competition in cases where the doctrine applied. The Court explained that when there is a structural increase in concentration due to a merger, the merger "is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects." Thus, the Court created a presumption of an anticompetitive effect from a structural increase in concentration, placing the burden on the merging parties to refute the presumption. The plaintiff would still be required to define the relevant markets involved and measure market shares and concentration, but a full-blown analysis of the impact of the merger was judged by the Court to be unrealistic and counter to the congressional intent to stem the rising levels of concentration in the United States.

The Court's approach is often referred to as a "structural approach," which is shorthand for the belief that mergers above a certain concentration threshold [\*477] have a reasonable probability of harming competition. The structural approach to merger analysis contrasts to the effects-based approach, which requires a prediction of the future competitive effects of the merger by use of detailed economic analysis. The Philadelphia Bank opinion implicitly rejected the effects-based approach because of its intractability. As the Eighth Circuit later commented, the structural approach is preferable in cases concerning potential competition since "proof of liability under either [potential competition] theory is certain to entail expensive, uncertain litigation, even if, as here, the acquiring firm is rich and powerful and the acquired firm's market highly concentrated." The practical requirements of proving the competitive effects of the threat of entry were deemed nearly insurmountable despite the importance of these effects.

In contrast to the Philadelphia Bank paradigm, later Supreme Court cases developed an unworkable legal standard for the potential competition doctrine. The Court imposed an initial stage open-ended proof requirement involving prediction of future conduct and performance that could not be practically discharged. In developing this standard, the Court divided potential competition into two separate legal doctrines - the actual potential competition doctrine and the perceived potential competition doctrine - with distinct evidentiary requirements. After separating actual and perceived potential competition, the Court twice expressed doubt regarding the viability of the actual potential competition doctrine. In these cases, the Court discussed the actual potential competition doctrine primarily in the context of acquisitions targeting a dominant firm, and not the context relevant to the current Big Tech mergers in which a dominant firm targets a startup.

The Supreme Court first addressed the issue of harm to potential competition from a merger one year after the Philadelphia Bank decision in United States v. El Paso Natural Gas Co. This case provides important insights [\*478] for the viability of the potential competition doctrine to Big Tech mergers since it is the chief example of the doctrine applied to a case where the potential entrant is the target firm. The case involved the merger between two natural gas pipeline companies and their impact on the California market. El Paso Natural Gas was the only supplier of natural gas to California when it attempted to acquire Pacific Northwest. The Court noted that Pacific Northwest had attempted to enter the California market by supplying Canadian natural gas to one of El Paso's customers in Southern California, Southern California Edison Co. The deal fell through only when El Paso agreed to a more favorable contract with its customer. The Court conceived of the potential harm from the merger as the elimination of influence of the potential entrant on El Paso, or the perceived potential competitive impact of Pacific Northwest. Pacific Northwest's threat of entry forced El Paso to act competitively, despite the company's monopoly in the California market. The evidence showed that El Paso did prevent Pacific Northwest's entry by matching and exceeding Pacific Northwest's offer to a California customer. If Pacific Northwest had captured the customer, it would have entered the market. Nevertheless, the Court chose to focus on the current impact of the entry attempt on El Paso's bid, rather than the more significant future impact Pacific Northwest might have had had it become a competitor in the California market. The Supreme Court would follow this emphasis on the impact of perceived potential competition in subsequent cases.

In the same year, the Supreme Court issued an opinion in another potential competition case. In United States v. Penn-Olin Chemical Co., the Court appeared to reject the structural approach of Philadelphia Bank, defaulting to a vague, open-ended analysis. Penn-Olin Chemical Co. involved a joint venture rather than a merger. All joint ventures raise potential competition issues because absent the joint venture one or both of the same companies might enter into the market alone.

In the Court's analysis, the joint venture eliminated a perceived potential entrant, removing the impact of an "aggressive, well equipped and well financed corporation engaged in the same or related lines of commerce waiting anxiously to enter an oligopolistic market" which disciplined the existing competitors. [\*479] Citing the El Paso Natural Gas case, the Court stated that potential competition "is not "susceptible of a ready and precise answer.'" It stated that analysis of the impact of a potential entrant depends on ""the nature or extent of that market and by the nearness of the absorbed company to it, that company's eagerness to enter that market, its resourcefulness, and so on.'"

In Philadelphia Bank, the Court had addressed the comparable complications of predicting the future effects of a horizontal merger by establishing structural judicial guidelines. Now, when addressing a parallel prediction of the impact of a potential competitor, the Court surprisingly defaulted to an ambiguous and open-ended narrative. The Court might be forgiven because it resolved the controversy by remanding the case back to the lower court to consider the perceived potential competition impact of the joint venture, but it did so without clear guidance on how such an analysis should proceed. In so doing, the case set a precedent in which the structural approach to potential competition was set aside in favor of a range of claims and presumptions about the intentions and perceptions of merging firms.

In 1967, the Supreme Court again confronted a potential competition problem in Federal Trade Commission v. Procter & Gamble Co., and moved the doctrine closer to the unworkable effects-based approach deduced from a subjective and imprecise evaluation of competitive conditions. Following the acquisition of Clorox Chemical by Procter & Gamble, the FTC blocked the merger, asserting, among other reasons, that Procter & Gamble was likely to enter the bleach market absent the acquisition. Procter & Gamble was a potential competitor in the market and had already launched an abrasive cleaner that was a differentiated substitute for liquid bleach. Procter & Gamble knew the liquid cleaning business, the customers of Clorox and Procter & Gamble largely overlapped, and the company advertised and merchandised in the same manner as Clorox. All of the factors led the FTC to conclude that the acquisition of Clorox by Procter & Gamble would eliminate a likely entrant into the liquid bleach market. Yet the court of appeals rejected the evidence of the closeness and proximity of the two markets and declared that there was insufficient evidence from the management of Proctor & Gamble that it intended to enter the liquid bleach market.

The Supreme Court reversed the court of appeals, but without offering a helpful analysis of the potential competition issues. The Court abstained from [\*480] analysis of actual potential competition and focused solely on the impact of Procter & Gamble as a restraining perceived potential competitor, even though the Court opined that it was "the most likely entrant" into the liquid bleach market. The Court also found, without explaining its basis, that Procter & Gamble did not face a barrier to entry and that "the number of potential entrants was not so large that the elimination of one would be insignificant." The focus of the court of appeals and the Supreme Court on aspects of competition such as the potential competitor's intention of entry, the likelihood of entry, and the number of potential entrants would support the inclusion of such difficult and even subjective or illusory criteria in the evidentiary standards for potential competition cases.

In 1968, the Department of Justice issued Merger Guidelines. While the Supreme Court was grappling with the early cases involving mergers that harm competition by preventing future entry, the Department of Justice developed a clear policy to protect new entry from mergers by dominant firms. According to the 1968 Merger Guidelines:

Since potential competition (i.e., the threat of entry, either through internal expansion or through acquisition and expansion of a small firm, by firms not already or only marginally in the market) may often be the most significant competitive limitation on the exercise of market power by leading firms, as well as the most likely source of additional actual competition, the Department will ordinarily challenge any merger between one of the most likely entrants in the market [and a firm with a large share of the relevant market.]

The acquiring or target firm must be one with the ability and incentive to enter and must be "one of the most likely potential entrants into the market." As discussed in a later Part of this Article, the 1968 Merger Guidelines faltered when addressing the evidentiary burden required to show that a target is one of the most likely potential entrants.

The 1968 Merger Guidelines' explanation of the required evidence to demonstrate potential entry is not a model of clarity. It requires that the Department of Justice marshal evidence demonstrating that entry by the firm [\*481] would be more profitable and less risky than other unidentified non-litigant third-party firms. In 1984, the Department of Justice would give more structure to this inquiry but would continue to require unworkable conduct and performance evidence that would make the potential competition analysis impractical and infrequent.

More clarity emerged from the Supreme Court's 1973 opinion in United States v. Falstaff Brewing Corp. The case involved the acquisition of Narragansett Brewing by Falstaff. Narragansett produced beer sold in the New England regional geographic market. Falstaff sold beer in thirty-two states and was the largest beer producer not in the New England market. The district court considered both the theory that Falstaff disciplined competition as a potential entrant and that Falstaff was a future actual entrant into New England. The district court held that evidence from Falstaff's management cast doubt on whether Falstaff was going to enter the New England market and that competition had not decreased since the consummated acquisition. Again, despite acknowledging the pertinence of the actual potential competition doctrine, in their decision the Supreme Court focused solely on the perceived potential competition aspect of the situation in which the merger "eliminates a potential competitor exercising present influence on the market." The district court erred by assuming that the subjective evidence from Falstaff's management meant that, as a matter of fact, Falstaff was not a potential entrant. Instead, the district court should have considered the objective evidence.

If the district court's approach had prevailed, it would have meant that plaintiffs asserting potential competition cases could be defeated by the uncontroverted testimony of the management of one of the merging entities. Instead, the Court thought that the proper inquiry was whether a rational incumbent firm would have perceived the acquirer as a likely entrant. It stated that "if it would appear to rational beer merchants in New England that Falstaff [\*482] might well build a new brewery to supply the northeastern market then its entry by merger becomes suspect under § 7." However, the Court does not inform us concerning what "economic facts about Falstaff and the New England market" should have been analyzed or what objective evidence should be consulted in order to ascertain the beliefs of a rational beer merchant. It appears that a complex, open-ended inquiry of this nature would lead to an unmanageable problem for a court. For an actual potential competition case, the Court offered even less, declining to even hold that a merger that prevents actual entry violates § 7 of the Clayton Act.

The Court's reluctance is puzzling. As described by Joseph Brodley, the Court has ample scope to apply and interpret the actual potential competition doctrine in both law and precedent. In early Supreme Court cases, the Sherman Act has been held to cover actual potential competition, and the Clayton Act "is an incipiency statute designed to prevent [mergers] that are beyond the scope of the Sherman Act."

The last and most influential Supreme Court case addressing the potential competition doctrine is United States v. Marine Bancorporation, Inc. The 1974 opinion, penned by Justice Powell, established the extraordinarily high requirements of proof that inoculate potentially anticompetitive mergers from scrutiny under the potential competition doctrine today. The case concerned the acquisition by Marine Bancorporation, a large Seattle-based bank, of the Washington Trust Bank, a smaller bank headquartered in Spokane, Washington. The government challenged the merger on both perceived and actual potential competition grounds. It argued that Marine Bancorporation's presence on the fringe of the Spokane market disciplined Spokane competitors, and that absent the merger, Marine Bancorporation would likely enter the Spokane market.

[\*483] The district court found against the government because Washington's state banking regulations prevented the kind of entry the government's theories predicted. The Supreme Court affirmed, but this time took the opportunity to develop a general methodology for analyzing actual potential competition mergers. According to the Court, "two essential preconditions must exist" before an actual potential competition theory "establishes a violation of § 7." First, that the potential competitor could enter the market at issue absent the merger. Second, that such entry would produce a likelihood of deconcentration or other significant procompetitive effects. Moreover, with respect to the first prong, the Court implied that "unequivocal proof" of actual future de novo entry is required. The standard of proof for the second prong is also exacting. The potential entry must accomplish more than simply increased competitive rivalry. It must deconcentrate the market or accomplish another "significant" but unspecified procompetitive transformation. Moreover, the Court expressed doubt that an actual potential competition case would be viable, even when these exacting standards are met. Because the government did not meet its burden regarding Marine Bancorporation, the Court would "express no view on the appropriate resolution of the question reserved in Falstaff."

Lower court interpretations of the binding precedent set forth in Marine Bancorporation demonstrate both the unworkable nature of the proof requirements and the difficulties attendant to requiring the judiciary to grapple with complicated conduct and performance predictions. For example, a few years after the Marine Bancorporation decision, the Fourth Circuit considered a potential competition claim by the FTC in 1977 in Federal Trade Commission v. Atlantic Richfield Co. The case involved the acquisition of Anaconda, a copper and aluminum mining and processing company, by ARCO, a large oil and petroleum company. The FTC claimed that ARCO was a likely entrant into the copper market. The Court interpreted Supreme Court precedent to require "clear proof" of entry (citing to the Marine Bancorporation standard of [\*484] "unequivocal proof"). The Court then relied on the testimony of ARCO's management. This is precisely the type of evidence eschewed by Falstaff. The Court found that "Arco would never seriously consider original entry or entry by toehold acquisition." Lack of proof of entry also doomed the government's cases in British Oxygen Co. International v. Federal Trade Commission, Tenneco, Inc. v. Federal Trade Commission, United States v. Siemens Corp., and Fraser v. Major League Soccer.

The Fifth Circuit, in Mercantile Texas Corp. v. Board of Governors of the Federal Reserve System, set forth a detailed analysis of its understanding of the proof requirements of an actual potential competition violation of the Clayton Act. According to that court, the required elements are: (1) a concentrated market; (2) no other potential entrants exist other than the target (or acquirer); (3) probability of procompetitive entry; and (4) procompetitive effects of independent entry. The court stated that when there are several potential entrants, the elimination of any one entrant would not be significant. It then added, following Richard Posner, that "economic theory suggests that, where oligopoly profits are available, a multitude of firms will eagerly seek to enter the market." Thus, the proponent of an actual potential competition case must show in the Fifth Circuit, contrary to the general case, that the specific facts at issue suggest that only the target (or acquiring) firm is a likely entrant. Thus, the court found that the plaintiff failed to demonstrate that the actual potential competition was "significant" because of the presence of other unanalyzed [\*485] potential entrants and that there was insufficient evidence that entry would have had a "significant" procompetitive effect.

The Department of Justice addressed the potential competition issue again in the 1982 Merger Guidelines drafted by appointees of Ronald Reagan, who were heavily influenced by the Chicago School of Economics. They were revised in 1984, and this was the last time potential competition mergers are addressed by the Merger Guidelines. The 1984 Merger Guidelines built upon but also significantly revised the Department of Justice's position developed in the 1968 Merger Guidelines. The 1984 Merger Guidelines treated perceived and actual potential competition together, thus implicitly rejecting the artificial division made by the Supreme Court. The Department of Justice considered four factors. First, the acquired firm's market must be concentrated, above 1800 HHI. Second, the acquiring firm must have specific entry advantages; otherwise, the elimination of the target still leaves many potential entrants. The number of firms likely to enter should be less than three. If there are more than three likely entrants then there must be direct evidence of likely entry. Third, the target must have a larger market share of twenty percent or more to make a challenge likely. Fourth, the 1984 Merger Guidelines required an analysis of the efficiencies of the proposed merger.

The 1984 Merger Guidelines were both a step forward and a step back from the 1968 Merger Guidelines. Unlike the 1968 Merger Guidelines, the 1984 version assumed that the acquiring firm is the potential entrant. The Department of Justice should have made clear that the potential competition doctrine can be applied in either direction; a merger can prevent entry by the acquiring firm or the acquired firm. The 1984 Merger Guidelines further provide that where entry is easy no merger challenge will be undertaken. This is a step backward from the 1968 Merger Guidelines. The 1984 Merger Guidelines never define ease of entry. At most, the 1984 Merger Guidelines declared that ease of entry is the likelihood and probable magnitude of entry in response to a small but significant and nontransitory increase in price. While the newer version of the Merger Guidelines added structure to the more opaque 1968 Merger Guidelines, it relied on another undefined concept, "entry advantage." As the antitrust scholar Joseph [\*486] Brodley points out, the most probable market entrant under the analytical structure of the 1984 Merger Guidelines is the firm that would achieve the greatest anticipated return from entry. According to Professor Brodley, "courts lack the expertise to resolve complex and speculative factual issues as to future costs and economic conditions. The cases are bound to be burdensome and expensive, especially when competing experts escalate the subtlety of the analysis."

Professor Brodley is correct. Analysis of entry under the Merger Guidelines requires a fairly sophisticated predictive financial analysis. To require a similar analysis for firms that are not parties to the analysis appears intractable.

Thus, the plaintiff asserting a violation of § 7 of the Clayton Act against a dominant firm in a digital market seeking to acquire a startup based on actual potential competition has a difficult uphill climb. First, many circuits do not recognize a reduction of actual potential competition as a viable theory under § 7 of the Clayton Act. Second, most courts, but not all, have considered the situation where the acquirer is the potential entrant rather than the incumbent, dominant firm. Third, the courts have demanded a high standard of proof for demonstrating that the startup would likely enter the market dominated by the acquirer. Fourth, even where entry is likely, the courts require that the target be uniquely situated to enter and not be one of many potential entrants. Fifth, the courts require proof that the startup's entry will significantly reduce the dominance of the dominant firm in its relevant market. These onerous requirements would deter even the most committed antitrust enforcer or plaintiff.

III. Application of the Potential Competition Doctrine to the Instagram and WhatsApp Mergers

In this Part of the Article, we describe the difficulty of applying the potential competition doctrine to Facebook's widely criticized acquisitions of Instagram and WhatsApp. Our intent is not to demonstrate that these acquisitions were anticompetitive but to show that the potential competition doctrine as presently formulated does not allow for a serious inquiry into tech mergers.

[\*487]

A. The Instagram Acquisition

When Facebook announced its $ 1 billion acquisition of Instagram on April 9, 2012, it was something of an anomaly. Although Facebook had made thirty-one acquisitions up to this point, none approached the price tag paid for Instagram. However, Instagram was different, and the opportunity arose at a critical crossroads for Facebook. On the eve of its May 2012 IPO, Facebook was under great pressure by investors to increase its revenue base. At the same time, the rise of mobile technology and its rapid adoption by consumers created hurdles for Facebook to satisfy these demands.

Two problems confronted the company as an increasing share of users accessed the internet from mobile devices. First, Facebook struggled to reorient its network from a desktop-based platform, and second, it had yet to monetize its mobile user base by incorporating advertising on the limited display area available on mobile screens. As other companies developed mobile-first applications that optimized web access using smartphones, Facebook elected to invest in an HTML5-based multi-platform strategy. On mobile devices, their HTML5 approach was slower and less stable than native iOS and Android applications. At the same time, mobile-native applications with social features such as Instagram and Foursquare were attracting growing user numbers and threatened to draw user engagement away from Facebook precisely when its revenue base was under scrutiny.

Photo sharing had been a key facet of Facebook's user engagement since its introduction on the network. By 2009, Facebook Photos was the largest photo sharing service in the world. In ensuing years as dramatic improvements in smartphone camera features made photo sharing an increasingly mobile-based activity, Facebook struggled to adapt to the shift to mobile technology. At this pivotal juncture, Stanford engineering graduates Kevin Systrom and Mike [\*488] Krieger launched the native iOS photo sharing social network Instagram. On Instagram, users could upload, edit, and share pictures from their iPhones and follow, comment, and like the images posted by others. The app also enabled users to post their Instagram images across social networks, including Facebook and Twitter. But the founders did not aim to be a mere content creator for other social networks. Rather, Systrom and Krieger envisioned their app as a rival to the incumbent social networking giants based on a community united under the premise that "the next network is people interested in sharing life visually." The company was poised to compete in the social networking market.

Within the first week of its October 6, 2010 launch on the Apple App Store, Instagram had garnered 100,000 user downloads. Ten weeks later it had accrued over 1 million registered users. The company quickly attracted the attention of venture capital that would allow it to scale. The firm's initial funding round brought former Facebook VP of Product Management Matt Cohler to Instagram's Board of Directors, who advised the company to pursue growth first without monetization in order to achieve the network effects that would drive advertising revenue later. One month before the company revealed its acquisition, just two and half years after its introduction on the App Store, Instagram founder Kevin Systrom announced that Instagram had reached 27 million registered users and "Facebook-level engagement." In the following weeks, Instagram branched out from iOS to launch on Android and brought in 1 million new users in the first twenty-four hours. When Facebook and [\*489] Instagram announced the acquisition six days after the Android launch, Instagram had over 30 million users and just thirteen employees.

According to Silicon Valley folklore, Zuckerberg invited Systrom to his home on a Saturday. By Monday the billion-dollar deal was done. Observers at the time registered their suspicions that the acquisition was an act of "squashing a potential rival" and pointed to the impending monetization of Instagram as a source of competition that could have driven down prices in online advertising markets. The merger triggered a Hart-Scott-Rodino filing, but ultimately the antitrust agencies took no action. The FTC investigation was nonpublic and enforcers did not disclose the basis for their decision at the time. One likely obstacle was the user price of zero set by Facebook and Instagram for their social networking services, which complicates estimates of markups above the competitive price or estimates of entry in response to a small price increase. In the social networking market, companies compete for user attention. The consumer-facing market generally has a price of zero, with services monetized in the advertising market by selling access to the user attention captured on the social network. Instagram operated in the social networking market and it was encouraging users to defect from Facebook to Instagram, but the competitive dimensions of this market are challenging to measure and interpret since users may participate on both networks and neither network charged for the services involved. Several economists have offered solutions to this problem, including measures of user engagement such as the [\*490] number of users or the amount of time spent on a website. By any reasonable measure, Instagram was already a competitor.

In contrast, advertising markets are not free. Digital advertising market analysts widely acknowledge the dominance of a duopoly in digital advertising composed of Google and Facebook, which jointly claim approximately 60% of total revenue in the market. For Facebook that dominance amounted to $ 16.6 billion in advertising income during the second quarter of 2019 and more than 98% of its total revenue. Facebook's advertising market power is even more significant when compared to similar advertising platforms. For example, during the 2007 investigation of the Google/DoubleClick merger, the FTC determined that search advertising (advertising delivered in response to a consumer search query) should be separated from display advertising (including image, video, rich media, etc., purchased on a webpage). According to the FTC, "the evidence shows that the sale of search advertising does not operate as a significant constraint on the prices or quality of other online advertising sold directly or indirectly by publishers or vice versa."

Today, Facebook leads the market in digital display advertising with a market share of over 40%. Arguably, an even smaller relevant market might exist for advertising on social networks. In 2011 and 2012, as Facebook struggled to monetize its mobile user base, Google and Facebook battled for the top spot, each controlling about 14% of the digital display advertising market in [\*491] 2011 and 15% in 2012. At the time of the merger, the majority of Facebook's revenue came from display advertising. Instagram did not sell advertising at the time of the acquisition, but it had been working directly with brands to support image-oriented ways of connecting companies with users. As the Instagram network grew, more businesses saw it as an important medium to reach consumers. When Instagram was ready for monetization, it would be unlikely to charge users for social networking services in a market where the going price was zero. Once Instagram introduced advertising it would likely compete with Facebook in the digital display advertising market as well as social networking. Instagram was an actual potential entrant in both of these markets. Thus, the Instagram merger presented a classic case of a potential competition merger under § 7 of the Clayton Act.

Although the FTC did not outline the considerations that guided its investigation, in August 2012 the United Kingdom's Office of Fair Trading (OFT) published an outline of its decision to refrain from referring the Instagram acquisition to the Competition Commission. OFT determined that Instagram was a current competitor in social networking services, and that Facebook's large share of the market achieved the threshold for investigation. OFT interpreted Instagram's rapid growth as an indication of low barriers to entry in social networking and photo sharing, concluding that Instagram did not evince a uniquely competitive product such that its acquisition would foreclose competition in either market. OFT considered Instagram as a potential competitor in digital advertising markets, but determined that Facebook's [\*492] competition from Google, Yahoo, and Microsoft dwarfed the potential competitive impact of entry by Instagram. It determined that there was "no realistic prospect that the merger may result in a substantial lessening of competition in the supply of display advertising."

Today, Facebook claims a dominant position in the social networking and online social photo services markets, and market power through the Facebook-Google duopoly over digital advertising. If the antitrust agencies faltered, it was likely because the potential competition doctrine created difficult obstacles for a merger challenge. Consider the following facts of the Instagram merger in light of the required proof under the 1984 Merger Guidelines to justify a Department of Justice challenge.

1. Market Concentration

The 1984 Merger Guidelines state that a challenge is unlikely if concentration in the acquired firm's market is below 1800 HHI. In the case of the Instagram merger, the relevant market to measure concentration would be the acquiring firm's market. Facebook operates in markets for social networking and digital advertising. By 2011, Facebook dominated the social networking industry by a wide margin in terms of user numbers and engagement, but HHI calculations lack defined measures for markets where the user price is zero. A workable measure of concentration is critical for markets like social networking in which the good or service is free. As zero-price markets proliferate, antitrust institutions must adopt new instruments for analysis or risk the amplification of consumer harms. Scholarship on the application of antitrust in these markets suggests that enforcement focus on attention and informational costs or metrics such as "time on site" to indicate the extent of competition for user engagement. Such a measure could have demonstrated [\*493] important implications of a Facebook-Instagram merger for competition in the market.

In the digital advertising market, the Facebook-Google duopoly already controlled 45.5% of revenue in 2011, although the majority of that share was attributable to Google. Narrowing the scope to the display advertising market, the top six firms in 2011 collected approximately 49% of the digital display advertising revenue and the HHI among those six firms amounted to just 546. In the years following the 2012 acquisition of Instagram, the Facebook-Google duopoly consolidated their market power in both the digital advertising and the display advertising markets. By 2018, both markets displayed HHIs of over 1800 and Facebook's share of display advertising revenue in the U.S. market rose to more than 20% - even higher if a more narrow market were defined. Thus, while it is likely that a measure of concentration for the social networking market would have satisfied the first prong of the merger guidelines analysis, the concentration levels measured for the display advertising market concentration levels would not have been sufficient.

2. Conditions of Entry Generally

The Department of Justice will not challenge a potential competition merger if entry into the market is easy. This protocol requires the Department of Justice to demonstrate some difficulty of entry or barriers to entry in the concentrated market. Through 2011, the markets for social networking and digital advertising had been dynamic as firms in these markets competed for dominance. The economies of scale and network effects that typify platform markets represent traditional barriers to entry that would reinforce the incumbency of dominant firms, but Instagram was showing the potential for a nascent competitor to siphon off users and gain market share. Entry into social networking or digital advertising markets was achievable for small and startup firms that operated in any of several adjacent markets if they exhibited the rapid growth in user engagement that would lead to increasing value on both sides of [\*494] the market and if they had access to the funding that would allow the company to scale up.

There is one significant barrier to entry in online platform markets that is unlike the traditional barriers considered in other markets: access to data. A dominant firm with access to broad user data has a significant advantage over new entrants. The data advantage allows a dominant firm to reinforce its market power in three ways. The firm can use data to review and improve user services in the core market and expand user engagement, generating more data. The firm can leverage its data advantage to reach new users through entry into adjacent markets and likewise expand its data access. Finally, the scope and magnitude of consumer data available to a dominant firm allows it to sell high-value, targeted advertising with revenues that may be invested in increasing user engagement and amassing more consumer data. These three advantages create a positive feedback loop for the dominant firm.

The drive to exploit user attention and access to data may translate to gains for consumers who enjoy higher quality services and seemingly individuated advertising. For startups with comparatively little data access, the competitive advantage of large firms' data scale and efficiencies poses a significant barrier to entry. As a result of these advantages, the dominant, consumer-facing platforms also dominate advertising markets - a tendency exemplified in the Facebook-Google duopoly.

Despite these structural barriers, demonstrating the difficulty of entry into the social networking or digital advertising markets presents a challenge. For one thing, the data barrier is specific to online platform markets. For another, competition for user attention forces the dominant firm to compete with platforms and applications operating across a variety of markets. There is no direct substitute for Facebook in the social networking market, but smaller firms offering complementary or adjacent features have the ability to capture user attention that draws engagement and profits away from the network, even if the smaller firm is not competing in social networking. This ability to capture user attention also makes these smaller, adjacent firms potential competitors in digital advertising. Extending consideration to potential competitors in adjacent markets where entry is relatively easy could undermine the government's ability to isolate any impact from the elimination of a single rival.

[\*495]

3. The Target Firm's Entry Advantage

If entry is not easy generally, then the Department of Justice has to show that Instagram had an entry advantage not possessed by three or more firms. For reasons discussed later, the potential for firms to enter social networking or digital advertising markets from a variety of adjacent or complementary markets makes it impossible to identify limits to potential entrants. Isolating the photo sharing market in the case of Instagram provides a good example of this difficulty.

Despite Facebook's dominance in photo sharing, several desktop-based and mobile applications existed at the time. Most of these platforms lacked the social features that distinguished the social networking elements available through Facebook and Instagram. Facebook even purchased several other photo-related services leading up to the Instagram acquisition, including the photo sharing and tagging website Divvyshot in April 2010, the file sharing, messaging, and commenting service Drop.io in October 2010, and video and image recording and editing app developer Digital Staircase in November 2011. In May 2012, after announcing the Instagram acquisition but before it was finalized, Facebook purchased Lightbox.com, a mobile social photo sharing application designed for Android, in the period before Instagram introduced its Android app. While Lightbox had amassed 1.5 million downloads in its first seven months of operation, Instagram's Android launch in April reached 1 million within a week. Facebook purchased and shuttered the Lightbox application, absorbing its employees and pulling the app from the market immediately. Facebook launched its own camera app, Facebook Camera, on May 24, 2012, weeks after announcing its intention to acquire Instagram.

The United Kingdom's OFT decision lists six competing apps in the photo sharing market, including Camera Awesome, Camera +, Flickr, Hipstamatic, Path, and Pixable. Of these services, only Camera+, Hipstamatic, and Camera Awesome included camera applications. Flickr is a photo storage and management tool and Pixable was an aggregator that scraped images from social networks including Facebook, Twitter, and Instagram. Path was a social network conceived as a competitor to Facebook that offered a more private experience, limiting social connections to invite more personal interactions. [\*496] Hipstamatic and Camera+ provided photo taking and editing tools but lacked the social features that distinguished Instagram. In addition, Hipstamatic and Camera Awesome had entered into a partnership with Instagram that streamlined posting photos taken with those apps to Instagram's social network. The OFT's list of competitors illustrates the difficulty of identifying potential entrants in the social networking or digital advertising markets. In online platform markets, new entrants often offer just a subset of the services offered by the dominant provider. Firms like Instagram that gain the popularity and funding to scale become rivals for user attention and potentially rivals for the market over time. Facebook would likely argue that Instagram is just one of many potential entrants into social networking, and that any of the other photo sharing apps could replace the potential competition lost through the Instagram acquisition. Moreover, when consumers multi-home by using several apps at once, entry by multiple firms becomes even more likely.

Facebook named Instagram as an important competitor, but it was not the only competitor. Instagram's entry advantages were the extraordinary user growth rate and venture capital investments that might allow the firm to overcome barriers of scale and data access in the social networking and digital advertising markets. These same advantages gained the attention of Facebook and its buyout proposal.

4. Deconcentration from Instagram Entry

The final criteria for a potential competition claim is for the government to show that Instagram's entry into the social networking or advertising markets would deconcentrate the market or have a significant procompetitive effect. Under the Merger Guidelines, this effect can be established by showing that Instagram had a market share of 5% or more. In 2012, the first year Instagram was included in the Pew Social Media Survey, 12% of adults - and a significantly higher share of young people - used Instagram despite the fact that it was a mobile-only application. There are no attentional measures such as [\*497] time on site available for the period before acquisition, but multi-homing and Instagram's own interoperability would suggest that the company claimed a small share of total social networking users' attention. The market draw for Instagram was its popularity with important demographic groups at a time when Facebook saw reaching young people and their preferred technologies as key to maintaining dominance in the market.

At the time of the Facebook acquisition, Instagram had not entered the digital advertising market and had no advertising revenue. It would be impossible to establish a procompetitive effect of Instagram's entry into the advertising market through the 5% threshold because competition from Instagram lay entirely in the future.

The potential competition challenge by the Department of Justice would have certainly failed under its own guidelines. But consider the post-acquisition information that retrospectively demonstrates how the guidelines produce a false negative result. Since the acquisition was finalized in 2012, Instagram has generated a significant share of user engagement and revenue for Facebook. With Facebook's resources and expertise guiding its evolution, Instagram reached 1 billion monthly active users in June 2018 even as Facebook's own user growth dwindled. According to the Pew Research Center, Instagram trails Facebook as the third-most popular social network in the United States with 37% of adults using the platform in 2019. It is the most-used social network for American teens. Although Facebook does not disclose Instagram's financial details, market analysts estimate that 15% of Facebook's revenues come from advertising on Instagram, a number expected to grow over [\*498] time. In 2019, Instagram launched a checkout feature allowing users to make purchases from within the app and delivering a new source of revenue to its parent company. It is impossible to know if Instagram would have developed into such a powerful position without Facebook's guidance, but it is clear that Facebook's ownership of Instagram allows it to reach a larger user base and achieve greater levels of user engagement and revenue generation than Facebook alone. The economies of scale and scope that characterize online platform markets are simultaneously a source of efficiency gains from the acquisition of Instagram and a barrier to entry reinforcing Facebook's dominance in the social networking market.

The Instagram case shows that the potential competition doctrine must be reformed. Common sense suggests that concentration must be measured either by an alternative metric in markets where goods are offered to the public without charge, such as user engagement, or possibly by the advertising dollars that flow to social networks. As we will discuss in the last Part of this Article, concentration should serve as a structural rebuttable presumption when a dominant firm purchases a potential entrant. Before turning to that issue, we briefly discuss Facebook's acquisition of WhatsApp.

B. The WhatsApp Acquisition

Facebook's $ 19 billion acquisition of WhatsApp was another landmark deal. In 2014, mobile messaging applications were the fastest growing app category in the mobile market as social media evolved to accommodate increasing smartphone usage. Users relied on these applications for far more than text messaging, with a variety of social activities taking place on the apps including voice calling, image and video sharing, and gaming. Five-year-old WhatsApp was already the largest and fastest growing of these applications worldwide. The app offered a reliable and affordable cross-platform technology for text, voice, image, and video sharing in one-to-one or group contexts that worked across national borders complete with end-to-end encryption. At the [\*499] time of the acquisition, WhatsApp had 450 million monthly active users and was gaining users at a record rate of one million per day. Importantly, WhatsApp users were unusually engaged; more than 70% of WhatsApp users accessed the app daily and its volume of messaging rivaled the global total of telecom SMS.

Two characteristics distinguished WhatsApp from its rival messaging services, and from Facebook's corporate model. First, WhatsApp's founders committed the service to almost complete data privacy. Second, WhatsApp was advertising-free. Instead of the intensive data collection, aggregation, and analysis driving advertising revenue on other apps and networks, the company elected a paid model with most users charged a $ 0.99 annual subscription fee after their first year of service. The app offered an alternative entry point into scaled-down social networking using only existing phone contacts to connect users; it was more personalized and lacked the privacy concerns and tracking characteristic of Facebook.

In February 2014 when Facebook and WhatsApp announced their merger, Facebook served over 1.2 billion monthly active users. Mobile devices had become an essential component of that usership. More than 75% of active users accessed the network through mobile technology and in the fourth quarter of [\*500] 2013 mobile Facebook users outnumbered those using personal computers for the first time in the company's history. Growth in user engagement was increasingly driven by mobile access to the social network and Facebook anticipated that future growth would similarly depend on mobile connections. In its 2013 Annual Report, Facebook identified mobile applications with competing social features including text messaging, voice, image, and video sharing as a key source of competition for the network.

Facebook's reorientation toward mobile-first engagement led the company to develop and release its own standalone messaging app, Facebook Messenger. As mobile users sought short, private, and real-time communication options, Facebook identified and acquired one of the best-received startups in the mobile messaging market, Beluga, and refashioned it into a Facebook product. Upon its release in August 2011, Messenger became the number one most-downloaded app on the Apple store overnight. Although Messenger quickly claimed the status of the most-utilized iPhone messaging application in the United States, Facebook struggled to make headway in markets like Europe where early movers had an established advantage and in emerging markets where consumers were more likely to access their networks through feature phones. In early 2014, when Facebook and WhatsApp agreed on their merger, Facebook Messenger had 200 million users compared to WhatsApp's 450 million. With [\*501] the purchase of WhatsApp, Facebook would claim ownership of the world's top two messaging companies in terms of market share by user numbers.

The $ 19 billion price tag made the WhatsApp acquisition one of the largest mergers in Silicon Valley history. Facebook's offer nearly doubled a prior bid from Google to buy the startup for $ 10 billion. Moreover, the $ 19 billion deal amounted to approximately one-tenth of Facebook's total market value, while the monetization opportunities associated with WhatsApp were as yet unproven. In 2013, WhatsApp operated at a $ 138 million loss. WhatsApp's commitment to maintain privacy precluded merging its users with Facebook's social graph and adding advertising or other monetization options would require a substantial change in WhatsApp's approach to the messaging market. For Facebook, the benefits of owning WhatsApp clearly involved future competitive advantages in messaging and social media. Firstly, the purchase thwarted rival Google's attempt to gain ground as a social network. Secondly, the transition from social sharing on broad networks to one-to-one and group messages promoting private, real-time interactions indicated a significant shift in the social networking services market. Facebook CEO Mark Zuckerberg increasingly alluded to this shift as an important guide for advancing social networking and other social media with his declaration that "the future is private."

True to form, the FTC cleared the merger without challenge in April of 2014, with a letter warning both companies about their responsibility to maintain the privacy agreements in place when WhatsApp users accepted the company's terms of service. The letter highlights the distinction between Facebook's data collection and advertising platform model and WhatsApp's promises that it will [\*502] not collect any personal or contact data from mobile phones or messages or send any marketing material without the user's consent.

The European Commission also conducted an investigation of the transaction and cleared the deal. The European Union (EU) primarily analyzed the merger within the confines of the relevant market for consumer communications services, not as a potential competition merger. Consumer communication services includes stand-alone apps such as WhatsApp, Viber, Line, WeChat, Facebook Messenger, Skype, and those integrated with smartphone hardware or operating systems like Apple's iMessage. In their analysis of consumer communications services, the Commission noted that low switching costs, the tendency for users to multi-home, and the overlap between consumers of the two platforms would undermine any barriers to entry derived from the network effects captured by the merged companies. On these grounds, they concluded that the merger would be unlikely to lead to increased concentration in consumer communications services.

The Commission ultimately found no competitive concerns in the online advertising services market, based on WhatsApp's abstention from advertising and data collection and the number of providers supplying online advertising at the time. The EU also analyzed the social networking market and again found no competitive concerns. According to the EU analysis, WhatsApp was not a participant in the social networking market. The Commission considered a social network to involve many functions in addition to communications, including contact lists, user profiles, relationship status, and other social features of online activity. Although the EU reported that several industry participants informed the Commission that they considered WhatsApp to be a social network already, and predicted that absent the merger WhatsApp would expand and scale in this market, the Commission dismissed these opinions. The EU placed considerable weight on statements from WhatsApp management, stating "no indication was found of WhatsApp's plans to become a social network [as defined by the EU] which would compete with Facebook absent the merger." In the Commission's view, identifying WhatsApp as a potential competitor in social networking would expand the scope of alternative sources of competition to include other prominent firms in the consumer communications market, [\*503] including LINE, WeChat, iMessage, Skype, Snapchat, Viber, and Hangouts. Such an expansion would only make it less likely that the elimination of a single rival would raise competitive concerns.

Next, the Commission evaluated the potential for Facebook to gain market power in social networking by integrating the two platforms. The addition of WhatsApp's consumer base to Facebook's social graph would reinforce the network effects that maintained Facebook's dominance in the market for social networking services. According to the Commission's report and later documents, Facebook testified that technical limitations would prevent any such integration without significant user involvement. The claims that technical issues prevented integration were proven false just two years later in 2016 when Facebook began to add WhatsApp user data to the Facebook social graph. The EU fined Facebook €110 million ($ 122 million) for misleading the Commission but did not reverse its authorization of the acquisition.

What the EU did not consider was the possibility that the social networking market could be disrupted by a mobile, reliable, private, no-frills competitor. While the Commission noted that innovation in communications services was driven by consumer demand for reliability, privacy, and security, and acknowledged that the social networking services and consumer communications services markets exhibited significant overlap, it did not identify the trends in consumer behavior pointing toward the increasing the importance of private, mobile social platforms. Facebook had honed in on the competitive threat that this shift in consumer preferences presented for social networking, especially as it manifested in demographic and geographic groups critical to user growth such as young mobile users and those in emerging markets.

WhatsApp may have posed important potential competition issues. The strength of its reliable private messaging capabilities, its social orientation connecting users through their address books, its access to unique user data, and its ability to scale untethered to a monetization strategy based on consumer [\*504] surveillance could have raised a threat to Facebook's social network strategy. WhatsApp also may have been able to partner with complementary service providers to generate revenue and develop innovative and competitive social communications products. We will never know.

The EU's analysis highlights the problems with the potential competition doctrine. First, the problems of evaluating concentration in the social networking and mobile messaging markets are identical to those pertaining to the acquisition of Instagram: enforcement agencies have yet to identify a workable measure of concentration or a credible data source. The European Commission's report notes the lack of appropriate measure, despite its own reliance on user numbers (provided by Facebook) as a proxy for market shares. Second, the perceived ease of entry and broad consideration of potential competitors ignores the data barrier that reinforces firm dominance in online platform markets and makes it difficult for the government to isolate the impact of eliminating individual rival companies. Finally, according to the U.S. Horizontal Merger Guidelines, a five percent market share would substantiate the potential for WhatsApp to have significant procompetitive effects in markets for social networking or digital advertising. The EU cites conflicting views on the distinct boundaries of social networking markets, but even if these boundaries were clear, proof of deconcentration still demands appropriate measures of market share and current participation in the market. Harm to potential future competition was alone inadequate to challenge the merger.

The high initial burden on the plaintiff to present a case concerning future conduct and competitive effects serves as a serious deterrent to potential competition mergers, even by dominant firms. Under a simply structural presumption the FTC could have elected to challenge the merger and shifted the burden to Facebook to demonstrate why no harm to future competition could occur, and why, given Facebook's resources it could not internally innovate to achieve its competitive goals. A structural standard of this type should be embraced by critics of agency intervention who believe that the government is poorly positioned to make a strong empirical case, since representatives of the private sector would be the first source of analysis.

[\*505]

IV. Reform of the Potential Competition Doctrine

The Instagram and WhatsApp examples demonstrate how the potential competition doctrine is designed to fail by placing an unrealistic burden on the government in a challenge to any of the hundreds of mergers by dominant technology firms. We do not think this case is merely the result of new technology that has rendered the law obsolete and unworkable. We argue that the law was made unworkable because of the ideological goals of the Chicago School of Economics.

A comparison of the law of horizontal mergers with potential competition mergers is instructive. The Philadelphia National Bank structural presumption remains intact today. The plaintiff, typically the government, bears the initial burden in a § 7 horizontal merger case of demonstrating that the challenged merger should be presumed to substantially harm competition. This is accomplished by showing that the transaction will lead to undue concentration. The burden then shifts to the defendant to rebut the presumption. If successful, the burden then shifts back to the government to present additional evidence of competitive harm. The structural presumption has survived despite erosion by the lower courts. For example, in United States v. Baker Hughes, Inc., Justice Thomas (then on the D.C. Circuit) sought to dilute the presumption stating:

The Supreme Court has adopted a totality-of-the-circumstances approach to the statute, weighing a variety of factors to determine the effects of particular transactions on competition. That the government can establish a prima facie case through evidence on only one factor, market concentration, does not negate the breadth of this analysis.

In contrast to the courts, when the Reagan Administration appointees to the Department of Justice revised the Merger Guidelines in 1982 they replaced the strong structural presumption in the 1968 Guidelines with a detailed multi-step effects approach that placed the full burden of demonstrating a merger will harm competition on the government itself. The shift was motivated by the Chicago School supposition that most mergers are efficiency producing, an assumption that was never backed by empirical evidence. The higher burden made it much less likely that the antitrust agencies would bring a merger challenge, and when [\*506] they did, defendants could point to any defects in the agency's proof induced by its own standards.

The shift away from the Philadelphia Bank structural presumption for mergers that impact potential competition came earlier. It was achieved in complete form in Justice Powell's opinion in United States v. Marine Bancorporation. This wrong turn in 1974 must be corrected in order for the potential competition doctrine to have any practical application in tech markets.

Thus, the starting point for our approach would be to resurrect the pre- Marine Bancorporation 1968 Merger Guidelines. Under the 1968 Merger Guidelines, a merger would be likely to be challenged when a firm with a large market share (above 25%) purchases a firm that is "one of the most likely entrants into the market." The determination of whether a firm is a likely entrant is based on the capacity of the firm to enter, an incentive to enter based on attractiveness or a special relationship of the market, and potential profitability of entry, or a manifested interest in entry. While a possible starting point, a further correction is required. The 1968 Guidelines' analysis of entry is open ended and not sufficiently amenable to a tractable structural presumption that could be used by the courts.

What is needed to address the intractability of proof in a potential competition merger is a reasonable proxy that can incorporate a structural presumption for the likely entry or entry advantage of the startup. Thus, the second component of our test is to adopt the proxy that Professor Joe Brodley referred to as a "legal surrogate to identify the entry advantage of the acquiring firm." Professor Brodley recommended the use of the concept of "proximate markets" to provide the structural presumption of ability to enter and entry advantage for a target firm. As Professor Brodley explained:

Market proximity is a concept of presumptive entry advantage. Two markets are proximate to the extent that a knowledgeable firm in one market [\*507] possesses the necessary production and marketing information and other capabilities to operate in the other. Market proximity provides a suitable surrogate for entry advantage because, other factors being equal, there is less risk and therefore less expense involved in entering a familiar market.

To establish proximity, Professor Brodley focused on the factors that would be critical to the entry analysis of a business: production, marketing, technology, and customer relations similarities. More pointed criteria can be defined given the accumulated knowledge concerning tech industry mergers. For example, proximity to the general search market in which Google is dominant would include factors such as specialized search features, search advertising abilities, and the overlap of users with Google properties. The criteria would capture a vertical shopping site that is supported by search advertising and would clearly be a proximate market to the general search market. There are many such vertical markets that are potential rivals to Google's general search advertising revenues. Proximate markets to the social networking market certainly would include markets that compete with the functions hosted by Facebook's social network for user engagement and/or compete for similar targeted advertising dollars. In addition, the ability to gather user data complementary to Facebook's may be indicia of proximity.

We pause to recognize that other scholars have proposed different tests. We argue here that these tests do not create a sufficient standard for potential competition cases, and would condemn the plaintiffs in such cases to unworkable standards.

To start, Professor John Kwoka proposed a test involving two components, one involving structure and one involving effect: "(1) satisfaction of one structural precondition for concern with mergers involving non-incumbent firms, and then (2) demonstration of certain features specific to the case of (a) a deconstraining merger or (b) an entry-negating merger."

The first step, demonstration of a structural precondition, requires that there be moderate concentration according to the 1992 Guidelines approach. Under recent guidelines, the standard for moderate concentration is substantially increased. Regardless, substantial concentration is a condition for bringing any merger challenge. Over-reliance on the guidelines (in any version) will effectively eliminate a potential competition claim and analysis we seek to bring.

Under Professor Kwoka's test, if the structural precondition holds, then the analysis hinges upon whether the merger is entry-negating or deconstraining. [\*508] If the merger is deconstraining, the transaction "would likely be challenged on the basis of convincing evidence that the firm represented an effective and significant constraint on competition among incumbents." Such "convincing evidence" would include "documents in the possession of incumbent firms indicating active monitoring of and reaction to the non-incumbent party to the merger" or "market data that demonstrate significant responsiveness by incumbents to actions of the allegedly constraining firm."

With respect to an entry-negating merger, Professor Kwoka would have the enforcement agencies challenge such transactions if the transaction meets a multi-factored analysis. These factors are all focused on intent and ability to enter.

One of the authors of this Article, along with Salvatore Massa, proposed a two-step approach for a party moving to show entry with an opportunity for the non-moving party to rebut the claim. In that article, the first step is to determine whether the firm intends to and has the ability to enter the market. Evidence that directly relates to the commitments and investments a firm has made for entry are the most direct and relevant. The difficulty with this test is that if the evidence is more equivocal, there is little guidance as to how to proceed - a point admitted to in the original article.

[\*509] The second step considered other factors that may influence the relevance of potential entry. The primary issue is whether the potential entrant firm has an ongoing influence on the market. To make this determination, the court may turn to external factors, such as general industry knowledge and the internal documents of competitors, to see if there is a perception that the firm is a potential entry threat. Econometric evidence that a potential competitor is constraining prices in the market is the strongest evidence. Where econometric evidence is ambiguous, courts could look to other evidence. Regardless, the party not asserting potential competition would have the ability to rebut the potential competition claim to demonstrate that the firm would not be able to discipline the market, have too remote an entry date, is unfit to enter the market, or is not unique in its ability to enter.

There are multiple problems with this approach. Most pressing apart from the test's complication, however, is that the ability to rebut will likely swallow the claim. In particular, uniqueness would likely be difficult to argue against.

Others have argued that the potential competition doctrine is "superfluous," and could be integrated into the recent Horizontal Merger Guidelines. The authors argue that the potential competition doctrine, whether actual or potential, is a meaningless distinction: "Whichever label is applied, the theory must involve a unilateral or coordinated horizontal effect, and its evaluation should be essentially the same. The new Horizontal Merger Guidelines are consistent with this approach."

[\*510] We consider this a weird flex. For one, it is not as if there have been a plethora of potential competition cases under any version of the Guidelines. To the extent that the Non-Horizontal Merger guidelines raised issues inconsistent with consumer welfare, those Guidelines have been disavowed. Moreover, even the Department of Justice has not consistently adopted a guidelines approach when seeking to prove potential competition, particularly outside of the area of § 7. Even within the realm of § 7, the Guidelines approach has proven problematic, and any rebranding of the Guidelines is unlikely to cure the issues we describe here. In short, neither Instagram nor WhatsApp would have been challenged successfully under any of these tests.

Under our approach, both the Instagram and the WhatsApp mergers might have been challenged. Instagram operated in a proximate market. In the months before the Instagram acquisition, Facebook identified photo sharing as a key component of social network functionality, particularly on the mobile platform, and a key facet of Facebook's own success. The social features common to Facebook and Instagram demonstrate considerable proximity between the two companies. The private messaging offered by WhatsApp was rapidly becoming a prevailing aspect of online communication for individuals and groups, with networks established via the user's own address book posing an alternative to the public platform approach. In both cases, users' increasing reliance on mobile technology for digital interactions forced a collision between Facebook and the proximate markets that provided the aspects of online interaction its users increasingly demanded. Under the structural approach, tech mergers like Facebook's acquisitions of Instagram and WhatsApp could be challenged and receive the scrutiny they deserve. Regardless of the particular cases engaged, the process would develop a new guide to judicial decision making in tech markets.

We advocate the informed development of a fully structural presumption for potential competition mergers in technology markets. We think that this is how the law of potential competition mergers should have developed after the Philadelphia Bank case but was derailed by United States v. Marine Bancorporation.

[\*511]

Conclusion

Big Tech has demonstrated that it has an insatiable appetite for acquisitions of small startups. The sheer number of acquisitions should raise red flags for the antitrust agencies. After many hundreds of such acquisitions, so few challenges or requests to fully investigate these acquisitions demands some explanation. We argue that one aspect of the problem is that the law of potential competition has developed in a manner that essentially ties the hands of the antitrust agencies because it demands levels of proof that are intractable, particularly for a court.

We have arrived at this point because of the widespread acceptance of the Chicago School's approach to mergers. The Chicago School asserted that only mergers to monopoly were a legitimate antitrust concern, and that mergers that do not result in monopoly are usually efficiency increasing and undertaken for that purpose. With these background presumptions, the Chicago School advocates jettisoned the structural approach to mergers and replaced it with an effects analysis that raised the burden to merger challenges and provided defense counsel with multiple avenues to attack a government challenge.

The efficacy of the potential competition doctrine fell to the same unsound premises beginning in 1974 in United States v. Bancorporation. The doctrine now embraces difficult tests of conduct and performance. In markets where tipping occurs, technology is rapidly changing, and startup firms can scale and challenge dominant incumbents, a viable potential competition law is critical to protect competition and consumers. What is needed is to untie the hands of government antitrust enforcers by articulating a clear structural test to identify acquisitions of potential competition. To achieve this standard, we contend that very little innovation in law or in economics is necessary. We need only reverse the damage brought by the Chicago School and its neoliberal revolution and return to the potential competition doctrine of the 1968 Merger Guidelines.

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## Innovation ADV

### AT: Endless War

#### No endless war impact.

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US Foreign Policy: Caricature versus Reality

In the eyes of proponents of restraint, the reigning concepts that guide America’s role in the world embody a limitless drive for supremacy and power that has produced an infatuation with militarism and a litany of interventions and wars. “There is one dominant grand strategy in US politics,” two advocates for restraint contend, “which is primacy, also known as liberal hegemony.” 4 “The vast majority of US foreign policy makers are devotees of primacy,” concludes another recent essay. 5 The historian Stephen Wertheim refers to a post-Cold War US approach that “gave pride of place to military threats and methods” and that “spares no expense for military hegemony.” 6 The scholar Barry Posen, in one of the defining works of the restraint literature, points to an overriding implication: “the United States has grown incapable of moderating its ambitions in international politics.” 7

Immediately, this portrait of militarized liberal hegemony in search of primacy simplifies a more complex reality: the concepts of primacy and liberal interventionism overlap on some issues but diverge starkly on others. More importantly, much of the literature on restraint blends these various concepts in order to fuel what quickly becomes an essentialist critique of US foreign and security policy. Proponents argue that US policy is not merely imperfect at the margins—its basic assumptions and impulses are fundamentally unsound, and it must be not merely pruned but substantially uprooted. Yet, by depicting the guiding concepts of US policy with such extreme and unconditional language, these diagnoses tend to deal in caricatures and straw people rather than realities.

This polemical approach emerges in restraint proponents’ treatment of the basic US foreign policy record. It has had its share of excesses, but the record betrays far more limits, hesitation, and, in fact, restraint than the labels of primacy and liberal hegemony would suggest—something apparent in the repeated tendency to avoid interventions, major post-Cold War cuts in defense spending and global posture, and the constraints on liberal value promotion.

The Frequent Impulse to Moderation

The restraint literature downplays the often-powerful reluctance with which successive US administrations have grappled with most decisions to intervene. US action in cases like the Balkan wars and even Libya only came with great hesitancy and after fierce internal debates.8 The United States has shunned many opportunities for large-scale interventions in the last generation alone—in Somalia, Rwanda, Syria, and elsewhere.9 US administrations did not act in crises in the Great Lakes region of Africa and two major examples of Russian aggression in Georgia and Ukraine.10 An infamous case of non-intervention was the Darfur tragedy in the Sudan, when credible accusations of genocide did not prompt US action.11 The United States would never have invaded either Afghanistan or Iraq had it not been for 9/11; indeed, then-NSC official Richard Clarke and others begged two administrations to strike al-Qaeda camps in Afghanistan for months beforehand, to no avail.12 In regard to humanitarian intervention broadly speaking, the selectivity of US action, rather than a general impulse to intervene, is the dominant lesson.13

Even with regard to Vietnam, two US presidents (Kennedy and Eisenhower) struggled to avoid an open-ended US commitment; when the United States did engage, it was because Lyndon Johnson felt a need to stand up to communist aggression and protect his personal reputation, but he was hardly enthusiastic about the prospect. He was painfully conflicted about the war and deeply regretted having to fight it.14 In other words, when US interventionism has occurred, it has often been reactive and halfhearted rather than aggressively ambitious.

In fact, the alleged epicenter of US global military power—the Department of Defense and the military services—have forcefully opposed many interventions in places like the Balkans, Somalia, and Libya, believing they should [conserve] ~~husband~~ their power for major wars. The two leading modern conceptual articulations of criteria for going to war—the Weinberger and Powell Doctrines—came from senior defense officials, and both represented efforts to constrain, not liberate, the use of force.15 Former Secretary of Defense Robert Gates told a graduating class at West Point that “any future defense secretary who advises the president to again send a big American land army into Asia or into the Middle East or Africa should ‘have his head examined,’ as General MacArthur so delicately put it,” 16 reflecting a widely held view at Defense—one far afield from the ideas of unrestrained primacy. A similar impulse for limits has emerged in major diplomatic initiatives. In a recent essay outlining a restraint agenda, Stephen Wertheim suggests that the United States should “seek to normalize relations with North Korea” in part with a nuclear deal, and that it should “end its grudge match” with Iran.17 In fact, the United States at one time embraced both these ideas in the form of the Agreed Framework with North Korea and the Joint Comprehensive Plan of Action (JCPOA) with Iran. The later US desertion of these accords was prompted by hawkish factions in two Republican administrations, not an indiscriminate national hegemonic inclination.18

Nor can US involvement in foreign wars and interventions usually be traced to a hegemonic desire to spread liberal values. A missionary attitude in foreign policy and liberal value promotion agenda may help lay the groundwork or justify the public case for unnecessary commitments and may be responsible for a few of them. But the largest interventions—Korea, Vietnam, the Gulf War, the Balkan wars, Afghanistan, and Iraq—were all primarily motivated by security considerations.19 Some of these actions may have been excessive to begin with or become so over time, and the security concerns that drove them may have been based on bad information or inflated fears. But they were not fueled by the boundless commitment to primacy and liberal value promotion described by many advocates of restraint. Limits to Ambition: By the Numbers Broadly speaking, then, the default setting of US foreign policy is hardly one of fervent interventionism. In terms of actual military posture and spending, if the United States had truly embraced hegemonic policies, there would be a trajectory of continually rising commitments, military spending, and interventions since 1945. Yet the actual record is starkly different. Table 1 tells an interesting story about one key focus of the restraint proponents—global military presence. Between the late 1980s and roughly 2018, US troop levels declined slightly in Japan, more than 40 percent in Korea, and 80 percent in Europe. The result was that, as the Pew Research Center put it, by 2016 the “U.S. military overseas presence [was] at a 60-year low,” falling well below 200,000 after having reached a peak of 1.2 million in the late 1960s and remaining at over 600,000 as recently as 1990. In 2016, only 15 percent of active-duty US military troops were deployed overseas—the lowest proportion since 1957.21 One partial exception to this trend, of course, is the Middle East, where after a history of “extremely light force presence” 22 before 1990, US regional deployments expanded across the region in the wake of the Gulf War and ramped up dramatically during the Iraq War. Various factors—including the flow of units into and out of the region, the use of private contractors to fulfill some functions, and limits on public information—make it impossible to put a precise figure on US deployments; the Congressional Research Service has estimated that as of 2019, there were 60,000 to 80,000 US troops in the Central Command

Table

Description automatically generated

(CENTCOM) area of responsibility.23 Yet even here, these numbers are well down from the recent peak: the Obama administration’s withdrawal of most US combat forces from Iraq meant that numbers there plummeted from over 160,000 in 2006– 07 to residual levels by 2012.24

The story of US defense spending from 1988 to 9/11 is also one of gradual decline. All told, “inflation-adjusted military spending fell by one-third in the 1990s.” 25 The defense budget shows a similar pattern over a longer time period—a downward slope from about 16 percent of GDP in the early 1950s to less than 3 percent by the end of the 1990s, and then, after a bump from 9/11 and the war on terror, back down to 3.1 percent in 2018.26 (Even before the current pandemic, the Congressional Budget Office had projected a further decline to 2.8 percent of GDP by 2029.27) The United States also took advantage of the end of the Cold War to slash its nuclear arsenal from a peak of 31,255 weapons to fewer than 5,000.28 Therefore, had an advocate of restraint called in 1989 for a one-third cut in defense spending, an 80 percent reduction in troops in Europe, and an 85 percent cut in the US nuclear arsenal, they would have gotten everything they asked for. Restraint proponents would doubtless suggest that spending remains too high and that US global posture—with hundreds of bases and deployments across dozens of countries—remains too elaborate. Both may be true, and further cuts may be called for. But the record of US foreign policy does not reflect a one-way trajectory of defense posture and spending in service of primacy and liberal hegemony.

An Inconsistent Urge to Transform the World

In his most recent book, eminent realist John Mearsheimer defines US hegemonic aspirations in especially absolute terms, specifically regarding the promotion of liberal values. The focus of Mearsheimer’s ire is liberal hegemony, which he defines as “an ambitious strategy in which a state aims to turn as many countries as possible into liberal democracies like itself while also promoting an open international economy and building international institutions” through “an active policy of regime change.” Liberal hegemony thus inevitably becomes a “highly interventionist foreign policy that involves fighting wars,” “doing significant social engineering in countries throughout the world,” and “toppling autocracies” which, according to Mearsheimer, results in an “abysmal record of failure.” 29 Stephen Walt joins Mearsheimer in condemning the pursuit of such liberal hegemony as a “costly failure.” 30

It is not clear at what country this critique is aimed, but it certainly is not the United States. During the Cold War, of course, many criticized US foreign policy specifically for embracing many dictatorships—from Pinochet’s Chile to the Shah’s Iran to authoritarian governments in Guatemala. Since the Cold War’s end, the United States has had active regime change policies aimed at only a handful of states. Even with regard to some of these, the record is full of swerves: the United States infamously toyed with engaging Saddam Hussein’s Iraq in the 1980s before gradually sliding toward an unofficial regime change policy by the late 1990s. (Even after fighting Saddam Hussein’s Iraq in the Gulf War, the Bush administration famously decided not to overthrow him, a decision that reflected a remarkable degree of restraint.31) US regime change ambitions with both Iran and Cuba were effectively shelved by the Obama administration (even if revived, at least with Iran, by the Trump administration).

The United States has persistently encouraged the gradual advance of liberal values through more patient means such as broad-based engagement, support for human rights activists, and investments in civil society organizations. But these indirect, long-term approaches are a far cry from the vision of a militarized liberal hegemony.

As an example of the gap between this caricature and actual US policy, consider the US approach to the roster of autocratic states in 1990. Many of these were clustered in Africa; the United States called for improved human rights policies on the continent but had no real, active regime change policies toward any of these governments. Globally, Washington counted many regimes then defined as illiberal—including Saudi Arabia, Oman, Indonesia, Egypt, and Morocco—as friends. It was busily embracing a policy of engaging China, the world’s biggest autocratic regime, and would soon be on the road to mending ties and eventually initiating a strategic partnership with Vietnam. The direct clashes that did exist with autocratic states (largely Cuba, Iran, Iraq, and North Korea) were the product of specific histories or aggressive behavior on the part of these regimes, not any generalized crusade against illiberalism.

To be sure, dreams of liberal value promotion have always inspired US goals and have ornamented some US policies since 1945. The rise of the Responsibility to Protect (R2P) and related interventionist doctrines in the 2000s did help produce what may be the single example of an intervention prompted largely by such considerations—the European and US action in Libya in 2011. Even here, that outcome followed a US effort to embrace the regime: when Washington secured Libyan promises of nonproliferation in 2003, it was happy to remove sanctions on Muammar Qaddafi’s government and move toward rapprochement without much attention to human rights. Washington presumably hoped that such engagement would produce reform and change, but this slow, steady, peaceful approach to value promotion is presumably just the sort of alternative to militarized hegemony that restraint advocates would want. Beyond Libya, the allegedly belligerent approach to liberal hegemony has been evident in remarkably few cases.

To some degree, Mearsheimer is actually making an argument about a momentary period of surplus power, not more perennial motives behind US strategy. He claims that it is not merely a liberal hegemonic impulse that has produced US interventionism, but the fact that “the United States was so powerful in the aftermath of the Cold War that it could adopt a profoundly liberal foreign policy.” 32 If America’s relative power ebbs, he predicts, so will its liberal ambitions.

It is certainly true that, after 1989, America’s preeminent position allowed it to expand its ambitions to an unhealthy degree. But this temptation has been fading for years; the existence of surplus power, for example, cannot solely explain US interventions in Afghanistan or Iraq, neither of which would have occurred absent 9/11.33 Any great power enjoying unrivaled predominance will be tempted to widen its ambitions. That US foreign policy did not run even more amok during these years, given its massive surplus power and the lack of any real countervailing force, is perhaps the greater wonder.

In sum, the record of US foreign policy, both during and after the Cold War, does not look like anything close to an unalloyed embrace of primacy and liberal hegemony. It is the story of potent but also constrained ambitions, repeated efforts to meddle in other societies, and many refusals to do so. It is a complex history of partial global engagement marred by a handful of truly excessive tragedies (dominated by a single case—Iraq—which as of 2012 accounted for 67 percent of casualties and 64 percent of costs of all post-1990 US interventions34)—shaped at every turn by kaleidoscopic mixtures of political impulses and constraints, military realities, personality conflicts, ambitions tempered by risk, and many other influences. It is not a record that looks anything like the portrait of hegemony found in much of the restraint literature.

### AT: Transition

#### Retrenchment causes global instability, nuclear annihilation, and xenophobia---draws the US back into the same conflicts, but with more consequences.

Thomas Wright 20, Director of the Center on the United States and Europe and a Senior Fellow in the Project on International Order and Strategy at the Brookings Institution, doctorate from Georgetown University, a Master of Philosophy from Cambridge University, and a bachelor's and master's from University College Dublin, “The Folly of Retrenchment,” Foreign Affairs, 02-10-2020, <https://www.foreignaffairs.com/articles/2020-02-10/folly-retrenchment>

IS LESS REALLY MORE?

The realists and the progressives arguing for retrenchment differ in their assumptions, logic, and intentions. The realists tend to be more pessimistic about the prospects for peace and frame their arguments in hardheaded terms, whereas the progressives downplay the consequences of American withdrawal and make a moral case against the current grand strategy. But they share a common claim: that the United States would be better off if it dramatically reduced its global military footprint and security commitments.

This is a false promise, for a number of reasons. First, retrenchment would worsen regional security competition in Europe and Asia. The realists recognize that the U.S. military presence in Europe and Asia does dampen security competition, but they claim that it does so at too high a price—and one that, at any rate, should be paid by U.S. allies in the regions themselves. Although pulling back would invite regional security competition, realist retrenchers admit, the United States could be safer in a more dangerous world because regional rivals would check one another. This is a perilous gambit, however, because regional conflicts often end up implicating U.S. interests. They might thus end up drawing the United States back in after it has left—resulting in a much more dangerous venture than heading off the conflict in the first place by staying. Realist retrenchment reveals a hubris that the United States can control consequences and prevent crises from erupting into war.

The progressives’ view of regional security is similarly flawed. These retrenchers reject the idea that regional security competition will intensify if the United States leaves. In fact, they argue, U.S. alliances often promote competition, as in the Middle East, where U.S. support for Saudi Arabia and the United Arab Emirates has emboldened those countries in their cold war with Iran. But this logic does not apply to Europe or Asia, where U.S. allies have behaved responsibly. A U.S. pullback from those places is more likely to embolden the regional powers. Since 2008, Russia has invaded two of its neighbors that are not members of NATO, and if the Baltic states were no longer protected by a U.S. security guarantee, it is conceivable that Russia would test the boundaries with gray-zone warfare. In East Asia, a U.S. withdrawal would force Japan to increase its defense capabilities and change its constitution to enable it to compete with China on its own, straining relations with South Korea.

The second problem with retrenchment involves nuclear proliferation. If the United States pulled out of NATO or ended its alliance with Japan, as many realist advocates of retrenchment recommend, some of its allies, no longer protected by the U.S. nuclear umbrella, would be tempted to acquire nuclear weapons of their own. Unlike the progressives for retrenchment, the realists are comfortable with that result, since they see deterrence as a stabilizing force. Most Americans are not so sanguine, and rightly so. There are good reasons to worry about nuclear proliferation: nuclear materials could end up in the hands of terrorists, states with less experience might be more prone to nuclear accidents, and nuclear powers in close proximity have shorter response times and thus conflicts among them have a greater chance of spiraling into escalation.

Third, retrenchment would heighten nationalism and xenophobia. In Europe, a U.S. withdrawal would send the message that every country must fend for itself. It would therefore empower the far-right groups already making this claim—such as the Alternative for Germany, the League in Italy, and the National Front in France—while undermining the centrist democratic leaders there who told their populations that they could rely on the United States and NATO. As a result, Washington would lose leverage over the domestic politics of individual allies, particularly younger and more fragile democracies such as Poland. And since these nationalist populist groups are almost always protectionist, retrenchment would damage U.S. economic interests, as well. Even more alarming, many of the right-wing nationalists that retrenchment would empower have called for greater accommodation of China and Russia.

A fourth problem concerns regional stability after global retrenchment. The most likely end state is a spheres-of-influence system, whereby China and Russia dominate their neighbors, but such an order is inherently unstable. The lines of demarcation for such spheres tend to be unclear, and there is no guarantee that China and Russia will not seek to move them outward over time. Moreover, the United States cannot simply grant other major powers a sphere of influence—the countries that would fall into those realms have agency, too. If the United States ceded Taiwan to China, for example, the Taiwanese people could say no. The current U.S. policy toward the country is working and may be sustainable. Withdrawing support from Taiwan against its will would plunge cross-strait relations into chaos. The entire idea of letting regional powers have their own spheres of influence has an imperial air that is at odds with modern principles of sovereignty and international law.

A fifth problem with retrenchment is that it lacks domestic support. The American people may favor greater burden sharing, but there is no evidence that they are onboard with a withdrawal from Europe and Asia. As a survey conducted in 2019 by the Chicago Council on Global Affairs found, seven out of ten Americans believe that maintaining military superiority makes the United States safer, and almost three-quarters think that alliances contribute to U.S. security. A 2019 Eurasia Group Foundation poll found that over 60 percent of Americans want to maintain or increase defense spending. As it became apparent that China and Russia would benefit from this shift toward retrenchment, and as the United States’ democratic allies objected to its withdrawal, the domestic political backlash would grow. One result could be a prolonged foreign policy debate that would cause the United States to oscillate between retrenchment and reengagement, creating uncertainty about its commitments and thus raising the risk of miscalculation by Washington, its allies, or its rivals.

Realist and progressive retrenchers like to argue that the architects of the United States’ postwar foreign policy naively sought to remake the world in its image. But the real revisionists are those who argue for retrenchment, a geopolitical experiment of unprecedented scale in modern history. If this camp were to have its way, Europe and Asia—two stable, peaceful, and prosperous regions that form the two main pillars of the U.S.-led order—would be plunged into an era of uncertainty.

## Alignment ADV

## OFF

### T Per Se---2AC

#### 2. We meet---‘prohibition’ is injunction. That can happen after review.

Sarah E. Light 19, Assistant Professor of Legal Studies and Business Ethics, The Wharton School, University of Pennsylvania, “The Law of the Corporation as Environmental Law,” 71 Stan. L. Rev. 137, Lexis

While antitrust law can serve as an environmental mandate by prohibiting collusive behavior that keeps environmentally preferable goods from the market, there is also conflict between antitrust law's goals of promoting competition and environmental law's goals of promoting [\*177] conservation. 192 Because antitrust law's per se rule and rule of reason operate on a somewhat fluid continuum, 193 this Subpart discusses the two doctrines together. The per se rule operates as a prohibition, whereas the rule of reason operates as both a prohibition and a disincentive.

As noted above, antitrust law generally prohibits certain types of market activity - price fixing, horizontal boycotts, and output limitations - as illegal per se, and harm to competition is presumed. 194 For example, if an industry association declines to award a seal of approval necessary for a product's sale without any good faith attempt to test the product's performance, but rather simply because that product is manufactured by a competitor, such an action would be illegal per se. 195 Under this Article's framework, a per se violation is thus a prohibition.

The more fact-intensive inquiry under the rule of reason tests "whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition." 196 While this extremely broad statement might suggest that any fact is relevant to the inquiry, the salient facts under the rule of reason are "those that tend to establish whether a restraint increases or decreases output, or decreases or increases prices." 197 If an anticompetitive effect is found, then the action is illegal and the rule of reason operates, like the per se rule, as a prohibition. 198 The rule of reason can also operate as a disincentive, even if no [\*178] court finds an anticompetitive effect, as uncertainty and litigation risk may discourage firms from undertaking legally permissible, environmentally positive industry collaborations. 199

#### 3. Counter-interp: ‘prohibitions’ can contain exceptions---it doesn’t have to be all.

Sandra L. Lynch 2, Judge on the United States Court of Appeals, First Circuit, “Second Generation Props., L.P. v. Town of Pelham”, 313 F.3d 620, 634, 2002 U.S. App. LEXIS 25904, 12/17/2002, Lexis

§ 332(c)(7)(B). We start with the fact that Congress used "services" and not "service." A straightforward reading is that "services" refers to more than one carrier. Congress contemplated that there be multiple carriers competing to provide services to consumers. That one carrier provides some service in a geographic gap should not lead to abandonment of examination of the effect on wireless services for other carriers and their customers. Next, the phrase "have the effect of prohibiting" may well refer to actions that mostly prohibit. For example, B.A. Garner, A Dictionary of Modern Legal Usage 256 (2d ed., 1995), gives as the first definition of effective "having a high degree of effect." (emphasis added). Accord B.A. Garner, A Dictionary of Modern American Usage 237-38 (1998). Moreover, a common reading of the word "prohibition" standing alone would apply to a situation of denial of services to the vast majority of users. See, e.g., Oxford English Dictionary (2d ed. 1989) (defining [\*\*33] "prohibit" as "to prevent, preclude, hinder") (emphasis added). Thus Congress may well have meant the effective prohibition clause to reach certain situations in which there is some coverage in a gap.

#### Coherence---it’s impossible to apply to ‘anticompetitive’ conduct.

Donald L. Beschle 87, Associate Professor of Law at The John Marshall School of Law, B.A. from Fordham University, J.D. from the New York University School of Law, LL.M. from Temple University School of Law, “"What, Never? Well, Hardly Ever": Strict Antitrust Scrutiny as an Alternative to Per Se Antitrust Illegality”, Hastings Law Journal, March 1987, 38 Hastings L.J. 471, Lexis

This Article argues that the defenders of per se analysis have assigned themselves an impossible task. Arguing that types of activity can [\*476] be identified as invariably anticompetitive is futile; counterexamples can almost always be put forward. Consequently, defenders of per se categorization are reduced to one of two unattractive alternatives. First, they can concede that per se categories may in some instances prohibit procompetitive activity, but argue that the overall benefits of per se categorization justify the result. Such an argument is unsatisfying because it explicitly sacrifices particular blameless defendants in order to search for an increase in general welfare. Second, per se defenders can narrow their categories to eliminate procompetitive counterexamples. This strategy, however, threatens to destroy those categories entirely. And if most of the once-condemned activity is returned to the realm of the rule of reason, the insight that certain types of behavior are particularly dangerous is lost.

### T Private Sector---2AC

#### ‘Private sector’ includes subsets.

TD 21 – The Definition, ‘private sector’, https://the-definition.com/term/private-sector

Private sector refers to an umbrella term that may be applied to any or all of the nonpublic or commercial individuals and businesses, specified nonprofit organizations, most of academia and other scholastic institutions, and selected nongovernmental organizations.

### Capitalism K---2AC

#### Competition is a complex web of systems that requires a pluralist lens for an accurate assessment.

Clive L. Spash & Adrien O.T. Guisan 21, Chair, Public Policy and Governance, Vienna University of Economics and Business; PhD, Vienna University of Economics and Business, "A Future Social-Ecological Economics," Real World Economics Review, No. 6, 09/07/2021, pg. 203-214.

Economies are the socially structured institutional process involving the interaction of humans with the natural world. Social reproduction is achieved only within the bounds of the given structure and mechanisms of biophysical reality. The form and scale of economic processes depends upon a set of spatially and temporally contextual social institutions. That is economics concerns the form and function of social provisioning process which can take various forms and are far from limited to price-making market or capitalist institutions. Starting from processes of social provisioning, economics becomes the study of plural historical, actual and potential economies with their underlying institutional arrangements and biophysical basis rather than a singular abstract idealised “economy”. This broadens analysis not only to what institutions, norms and values shape the economic process and agents’ behaviours, but also to what are socially desirable and ecologically sustainable systems of social provisioning. Economics is neither value free nor ethically neutral but its stance on both should be made explicit. It must also be realist about how economies are reproduced via social and ecological mechanisms. That means linking to both power relations and ethical and just means of provisioning, but also material and energy throughput that respects others (human and non-human). The aspirations of economists to provide for the well-being of humanity, if taken seriously, mean a revolutionary change in economics is long overdue.

The philosophical basis of the approach is argued to be closest to critical realism. Core aspects of correspondence here are depth ontology raising the profile of both structure and mechanisms as opposed to a sole focus on empirical facts. Structure as a metaphysical reality with multiple causal mechanisms operating in open systems then poses challenges for how economics conducts itself as a science. While following critical realism in its epistemic pluralism there is also a recognised need for structuring interdisciplinary research and uniting diverse fields via common ontological understanding leading to a structured methodological pluralism (not the eclecticism of constructionism and conventionalism). Potential methods for research are selected on the basis of the qualities of an object of study and research question and as such remain open and diverse (quantitative/qualitative, intensive/extensive, see Sayer, 2010). Economic science is then neither deductivist, empiricist nor reducible to a set of idealised methods.

We start this explanation of SEE by taking issue with the hegemonic definition of economics based on choice and offer an alternative based on social provisioning. This clarifies the failure of economics to address different forms of economies both in theory and as actualised and operational both historically and at present. The relationship of economies to needs and their satisfaction with an associated material and energy throughput then becomes part of economic analysis. As noted, a clarified relationship between the ecological economic and the social is required and we explain some basic aspects of the relationship to social reality. This coverage is an outline of the ontological commitments of SEE, that is how reality is understood, its key constituents as far as an social-ecological economic system is concerned and some of their relationships. Next we outline the way in which economics can be conducted from the perspective of two other aspects of philosophy of science, namely epistemology and methodology.

II. Economics as the study of social provisioning

A rather obvious approach to defining what constitutes economics as a subject is to determine its primary object of study. Economics as an orthodoxy has for some time been dominated by a neo-Austrian dogma that was introduced significantly via Lionel Robbins (1932) and adopted into the mainstream, not least in microeconomic theory. This placed the concepts of resource scarcity and individual choice at the centre of a liberal political economy that was supposedly value free. The economic problem became meeting unlimited and competing wants and the supposed solution was meant to be resource allocation via “the market”, soon supplemented by (macro-)economic growth. In fact a single institutional process associated with capitalism was being advocated, namely, what Karl Polanyi (1957) termed, the price-making market. Robbins neo-Austrian definition then merged into Chicago school neoliberalism, where choice in a market setting, subject to price incentives, became the essence of economics and this has since permeated its meaning. This approach permitted an imperialistic expansion of economics into all sorts of subject areas, simply based on the idea that humans must make decisions as individuals so that any decision became an economic topic, e.g. equating everything from buying a cup of coffee to suicide (as infamously proposed by Becker, 1976).

In stark contrast, an older tradition regards the core of economics as determining the social and institutional arrangements for providing the needs of a community (or nation). Here the aim is to achieve a common good or well-being of all. What constitutes the good/well-being for a group then requires explicit ethical judgment. Modern times reduced the goal of seeking the “common weal” (i.e., the ability to fare well, prosper and have good fortune) into accumulating wealth and making money. Economics then simply became the study of capital accumulation using money and market prices and ultimately leading to economists’ claims of being able to determine optimally efficient public policy.

SEE immediately takes issue with reducing the subject down to studying something as singular as the economy, as if there were only one such entity or form. The term “the economy” is merely unthinking code for market capitalism, while denying actualised varieties of capitalism and that this is only one form of economic system (Hodgson, 2016). So rather than reduce economics to the study of one generic form meant to approximate the currently dominant system, a far broader approach is required, and not least so because this system is failing and creating catastrophic social and ecological crises.

A more comprehensive approach is to define economics as the study of social provisioning to meet human needs within an ethical framework of care and justice for others, both human and non-human. Social provisioning is a necessary activity for any social group whether a household, village, town, city, region, nation state or global collective. It concerns the ways in which people organise as social groupings to satisfy their needs. Markets as mechanisms for allocation are merely one form of arrangement and themselves diverse in structure.

Economics can then be seen as concerned with the variety of institutions for ensuring the satisfaction of needs and the reproduction of a society. Institutions here are to be understood as inclusive of conventions, norms, rules and regulations (Vatn, 2005). This immediately opens up economics for the consideration of alternatives and potentialities rather than the nihilistic claim that there are no alternatives.

A common objection to a focus on needs is that this is deterministic and fails to allow for the variety that appears evident in human society. Such a claim can be seen as confusing objective requirements with subjective means of their fulfilment. Thus Max-Neef (2009 [1992]) makes the distinction between needs and the satisfiers that enable their actualisation. He identifies nine fundamental needs – subsistence, affection, understanding, participation, leisure, creation, identity, freedom – that are regarded as universal and only changeable over extremely long time periods of species evolution (Max-Neef, 2009[1992]: 138). Meeting needs is regarded as a necessary prerequisite for human flourishing, while their means of fulfilment is socially contextual and varies across space and time (Rauschmayer and Omann, 2017). Satisfiers relate to the institutions, norms and practices that structure the satisfaction of needs, and will influence how economic goods and services contribute to their fulfilment or inhibition (Max-Neef, 1992). As such, while needs remain objective, how they are expressed, perceived, and fulfilled will always be subjective, conditioned by institutional arrangements and wider social and cultural contexts. This embeddedness and emergence of an economy from and with social structure forms one of the foundational ontological commitments of SEE.

In turn, social and economic systems are understood as being embedded in, and fundamentally constrained by, biophysical structures (Spash, 2017; Spash and Smith, 2019). All economic processes interact with their environment. There is a straight forward and basic dependency of economic systems upon flows of materials and energy as well as sinks for the necessary removal of waste material and energy. Economies are open social-ecological systems. Their processes operate within a set of limits prescribed by ecosystems structure and functioning, and social structure represented by actors and their institutional context.

III. The biophysical in economics

A basic fact, although absent from most economic thinking, is that natural resources and waste sinks are required to ensure social provisioning. The reproduction of societies must address the maintenance of ecosystems structure and their functioning or fail. Production fundamentally requires energy, or, more precisely, available energy termed “exergy”. That is, humans require energy capable of performing useful “work”, which is defined, as in physics, to mean the exertion of a force against some form of resistance (Ayres and Warr, 2009). Such work can be performed by humans, animals or machines, but will always require some input of exergy, whether it is the solar radiation embodied in food that fuels human and animal labour, or fossil fuels to power a heat engine. This dependency of societies on flows of energy and materials is captured in the concept of “social metabolism” (Krausmann, 2017). There is no single social metabolism because it will vary depending upon the structure of an economy and its social provisioning mechanisms, and there-in lies the potential of alternative socialecological economies.

The metabolic nature of human societies emphasises the role of materials and energy in their reproduction. This make the laws of thermodynamics central to any economic process as explored by Georgescu-Roegen (1971). The first law of thermodynamics stipulates that The metabolic nature of human societies emphasises the role of materials and energy in their reproduction. This make the laws of thermodynamics central to any economic process as explored by Georgescu-Roegen (1971). The first law of thermodynamics stipulates that

Human, and non-human, survival depends upon material and energy exchange which means on being open systems. Giampietro (2019) notes how Schrödinger described living organisms and ecosystems as having the capacity to seemingly avoid, or even reverse, entropic decay through interaction with their surroundings but this requires gathering available energy and concentrated materials from, and disposing of waste into, other systems. Entropy is not actually reversed because it continues in the larger system with which living organisms interact and are dependent. As biophysical entities living organisms are open systems. In general, open systems can maintain organisation, a given size and level of activity, but this has consequences for the systems with which they must interact. The growth of any organism, ecosystem or population is therefore fundamentally limited by the biophysical structure of its environment. These are termed horizontal limits by Devictor (2017: 120-121), because they relate to the spatial-temporal boundary for a given population, assemblage or ecosystem. The same principle applies to human societies and their economies, which depend upon ecosystems for flows of materials and energy as well as sinks for the waste they generate. Giampietro (2019) remarks that this implies that the processes ensuring the reproduction of elements of a “technosphere” (i.e. a social economy) must not interfere with the reproduction of elements in its associated “biosphere” (i.e. ecosystems structure and function) upon which they depend for maintaining a given scale of activity and organisation. Different societies have attempted to address this requirement in different ways with varying degrees of success in sustaining themselves.

Human history consists of a long period in which social provisioning was organised by free roaming, migratory, hunter gatherers prior to the rise of sedentary agricultural settlements. The former appear highly sustainable, long lived and relatively low impact, although some extinction of species is implicated. The latter consisted of small bioregional economies, with regional material flows and solar radiation as the main source of exergy, reliant on agriculture and forestry for various reproductive processes. The industrial revolution marked the start of a major transformation of social metabolism in human social and economic systems. The use of fossil fuels – coal then gas then oil – became the main source of exergy driving production processes, while increasing use of concentrated minerals replaced solar dependent plant and animal materials. This expansion of production, along with the development of artificial fertilizers, facilitated the growth of economic activities and populations beyond their previous limits (Spash, 2017).

This social metabolism appears highly unsustainable. After a few hundred years operating in just parts of the global provisioning system the results appear headed towards catastrophic collapse. The move away from exergy derived from solar radiation to finite stocks of concentrated minerals, combined with economic growth, has meant the social metabolism of industrialised human societies rapidly depleted the “entropic dowry” upon which it depends (Georgescu-Roegen, 1971). As a physically closed system, the Earth exchanges flows of energy but not of materials with its surrounding (at least not in any significant sense), while the reproduction of biospheric entities is made possible by the existence of various climatic systems that dispose of thermal energy into outer space, maintaining favourable conditions for life (Mayumi, 2017). Once used the stocks of low entropy are in effect irreversibly lost. In theory, the flows of exergy from solar radiation could be harnessed to reverse the dispersal of available energy on Earth, but to date this remains science fiction, while the ability to reconcentrate all dissipated materials to original quality on a substantive scale appears equally implausible (Spash and Smith, 2019). Recognising the biophysical reality of the economic process then leads to the inevitable conclusion that industrial economies are dependent on finite stocks exergy and their continued operation, let alone continual growth, is impossible over any extended period of time.

While the exhaustion of finite resources remains an ultimate limit on human activity, an arguably more pressing limit is the accumulation of waste. Industrial social metabolism “merely transforms low entropy into waste” (Georgescu-Roegen, 1971). As such, pollution should not be treated as a problem outside the system (i.e. an externality), or an anomaly, that could somehow be solved through increased efficiency, or correcting prices, but as an integral part of the economic process (Spash, 2021b). The Laws of Conservation indicate the inevitability of pollution because mass remains the same, but the quality of materials, like energy, declines. Ecological economists such as Daly (1992) have emphasised the scale of impacts from human activity (e.g. waste accumulation). What has been given less attention is the qualitative aspect arising due to the creation of artificial substances and interventions that would not have otherwise occurred and to which natural systems and entities are unable to adjust. Such unnatural impacts on the biosphere and ecosystems lie at the heart of the ecological crisis, such as the on-going mass extinction of species. Thus, not just the scale of human activity (e.g. quantity of waste, population size) but also its qualities determine the consequences for the environment and functioning of ecosystems. The importance of the form of intervention is why technology is never neutral, and also what determines the extent to which something is unnatural (Deckers, 2021). Humans are then engaged in processes of change not equilibrium and stability.

The development of ecology in the 1970s brought new insights into the structure of complex systems and their interconnections. This was mainly driven by the realisation of the disruptive impact of human activities on ecosystems’ structure and function, which in turn affected human systems (Spash and Smith, 2019). Contrary to previous views of ecosystems as isolated, self-regulating and stable systems, they became recognised as complex and dynamic open systems. The potentiality to change ecosystem structure dramatically following systems collapse was highlighted by Holling (2009[1986]), who described this organisation and reorganisation process as part of a cyclical pattern. The evolution of an ecosystem or population can be chaotic with abrupt changes in trajectory. Besides the “horizontal limits”, mentioned earlier, “vertical limits” are emergent and arise due to interactions between ecological levels and dependencies between different components of the system (Devictor 2017). Human activities interacting with ecosystems have uncertain and indeterminate consequences for their structure and function. In the face of such partial ignorance and indeterminacy over human intervention, public policy would better be precautionary than risk taking (Stirling, 2017), and society prepared to adapt rather than lock itself in to a specific “optimal” pathway (e.g. infrastructure, technologies, energy and materials).

IV. The social dimension of economics

Social reality is the dynamic outcome of human practices from which it emerges and by which it is reproduced (Lawson, 2006). However, emergence means that social structure while dependent upon is not reducible to human practices (e.g. individual behaviour). Social structure enables coordinated interactions through collective practices. Collective practices refer to accepted ways of doing things in a community, and can emerge in various ways, notably because of their functionality, but also simply by chance or repeated occurrences (Lawson 2012). They form a basis for individuals to form expectations as to the appropriate course of actions to follow in order to coordinate with others. Interconnected obligations and rights may evolve that are relationally constituted and constitutive of social positions (Lawson 2006). For example, the positions of employer and employee exist in relation to each other and entail associated rights and obligations for both parties.

How, and to what degree the actions of agents are pre-determined by social structure, as opposed to being autonomous, is a fundamental point of debate. Mainstream economics reduces “society” to being an aggregation of individuals who act purely out of individual selfinterest (i.e. maximising their own personal utility) and are basically identical (both ethically and psychologically). As such it cannot explain the historical variety in social provisioning systems – production and consumption patterns – throughout history and across contemporary cultures. This requires understanding human variety and social relations as emergent and mediated through institutions and values that interact with, shape and form economic structures. Human action is always relative to a particular context in space and time and set within social structure. While agency is restricted it is neither denied nor entirely pre-determined.

Following Jessop’s (2001, 2005, 2007) “strategic-relational” approach, structure and agency can be viewed as dialectical concepts beyond an artificial dualism. He considers structures as strategically selective, but not absolutely constraining, leaving some room for agency. His main argument is that structures generally tend to favour some actions over others. In this sense, he emphasize the importance of a strategic context for action: agents will strategically reflect on their (usually incomplete) understanding of structural constraints and opportunities and act accordingly. Action is therefore both structured, and “structuring” as it tends to reproduce structures and their patterns of strategic selectivity. These recursive interactions between agency and structure create tendencies because structures are not absolutely constraining. There is then only relative and temporary stability to patterns of strategic selectivity, with the possibility for actions to circumvent structural constraints or change them.

As structures are the product of human agency, they are dynamic and are open to change (Lawson, 2012). Through their practices and interactions, humans continuously (and often unintentionally) reproduce and transform the social structures that influence these practices. The employer-employee relation for example has evolved, with a changing set of rights and obligations as unions have negotiated better working conditions. Likewise, the social positioning of women has changed as emancipatory movements have fought for equal rights as citizens.

That major social structures can change (if generally only slowly) is evident from the contrast between modern society and archaic societies. For example, Sahlins (1972) described how hunter-gatherer economies were characterised by a high degree of underproduction and disdain towards accumulating material possessions. Modern industrialised societies promote over production and waste in a throwaway, fashion conscious mode of conspicuous consumption. Thus, modern consumer behaviour is not an ahistorical trait of human nature, but a specific form of social structure which helps reproduce the capitalist mode of production. The change in economic and social structure during the rise of capitalism and associated market economies has sometimes been described as a change in terms of the extent to which “the economy” is embedded in society. A prime example is the work of Karl Polanyi (1957) which argues that such modern market economies should be understood using a “formal” economic approach (i.e. individual choice in price-making markets). He regards most of human history as having been spent in “primitive” economies, where market exchange was largely or totally absent, and distribution occurred via reciprocity and kinship groups (Polanyi, 1957). Economic (provisioning) activities were described as being embedded in social relations and institutions. Understanding such economies required a “substantive” approach to economics in contrast to the formal approach, which he accepted as valid only for modern economies. The latter are governed by rational logic, efficiency, self-interest and prices which he believes means they can be regarded as disembedded from social relations (Gemici 2008; Polanyi, 1957).

While Polanyi highlights aspects of institutional differences between capitalist market economies and past economies, the division he draws between socially embedded primitive economies and socially disembedded modern economies is erroneous and only serves to reify the utopia of the “self-regulating market” that he painfully attempted to deconstruct (Spash, 2019; Gemici, 2015). The notion of (dis-)embeddedness fails to capture the changing qualities of social provisioning, and ultimately denies their social aspects. This encourages the separation of the social and economic, rather than their conceptual distinction and actual connection. Modern market economies are instituted differently than their historical counterparts, but market relations remain embedded-in, and built upon networks of social relations (Granovetter, 1985).

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Price-making markets have little, or in fact nothing, in common with perfectly competitive markets, where each firm has no power to set prices or control other factors of production. Actual market economies evidence oligopoly and monopoly power institutionalised in the corporation. Prices are the result of power relations and that includes the power to structure markets and regulations in ones own favour. Multi-national corporations and the Davos elite do not wait to be regulated; they lobby and influence government action in their favour opting for self-regulation when other choices are unavailable.

Power in the market place also means creating demand for products. Large firms have means to manipulate social attitudes, and therefore to manage what consumers buy and at what price (Galbraith, 1979; Kapp, 1978 [1963]; Spash and Dobernig, 2017). Promotion of dissatisfaction is the essence of modern marketing via normalising comparison with others, status-seeking (i.e. keeping up with the Jones’s), fashions, in-group/out-group identity, shopping as therapeutic and possessing the latest technology. Rather than industrial production leading to material satiation, and the need for less work, the consumer society has evolved with more work and more disposable products. This process has long been recognised as involving conspicuous consumption (Veblen 1991 [1899]) and manipulation by corporate and business enterprises (Galbraith 1969 [1958], 2007 [1967]; Kapp 1963).

V. Philosophy of economic science

Mainstream economics has attempted to employ and maintain discredited philosophical approaches to conducting itself as a science. On the one hand it aspires to finding objective truths through empiricism as if theory was unnecessary and data could speak for themselves. On the other it promotes a form of deductivism that places abstract mathematical models at its core with unquestionable foundational axioms divorced from any reality. Sometimes the two are combined in a pseudo logical empiricist approach,1 or claims to some vague form of positivism with epistemological positions such as a fact-value dichotomy, a naïve objectivism and the search for universal laws (Spash, 2012). None of this has been neutral, but has rather hidden an implicit conceptualisation of reality. Thus, the particular worldview of mainstream economics has tended to favour regarding economies as physically isolated, mechanical, self-regulating, equilibrating and predictable systems. Leaving an ontology to be defined by a methodology (whether deductivist or empiricist) means falling foul of the epistemic fallacy. That is, objects and their relationships only become accepted as valid, or even recognisable as relevant, if they conform to the methodology, e.g. if something cannot be measured it is ignored, effectively not existing in the analytical approach. Thus mainstream economics is blinkered by its methodological choices and methods (e.g. cost-benefit analysis) come to dictate understanding of reality (e.g. Nature must have a monetary price to be of value). In addition, contrary to the approaches of mainstream economists, the second half of the 20th Century saw a general recognition that science operates in a social context, and that our knowledge is fallible. However, the failings of mainstream philosophy of science are not the primary concern here (see Tacconi, 1998; Lawson, 2006; Spash, 2012, 2020), but rather we aim to suggest what would be a way forward in relation to SEE.

The search for philosophical foundations led Tacconi (1998) to propose a combination of post-normal science and constructionism. However, in its strong form constructionism denies realism and is incompatible with the ontological commitments of ecological economists to a biophysical reality independent of the human mind. Post-normal science is also not a philosophy of science, but an epistemological critique of traditional naïve objectivism in the natural sciences and its transference into the social sciences. As Tacconi (1998) seems to recognise his mixture of inconsistent approaches results in contradictions. Puller and Smith (2017: 19) summarise the problem as follows:

“Ecological economists seem to be searching for a way to combine a perception of the world as independent of our knowledge, while at the same time admitting the social construction of knowledge and the role of meaning-making in the social realm”

They then detail how a philosophical well-grounded approach can be found in critical realism, which combines ontological realism with epistemic relativism.

The form of critical realism of relevance here is associated with the early works of Roy Bhaskar (1975 [2008], 1979). As explored by Lawson (1997) in relation to economics, a strong emphasis is placed on the importance of addressing ontological issues. More specifically critical realism propose a depth ontology that goes beyond empiricist and actualist philosophies to give place to structure and the causal powers of their mechanisms. Structures and mechanisms make events happen. What is actualised is merely part of the potential and the result of which mechanisms and counter mechanisms are operative and which ones dominate. The empirically observable is then merely a subset of what is actualised based on human ability to take events into account.

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While social structures are human constructs they are no less real for that. Capitalism is, for example, a recognisable system with real mechanisms and effects (as described earlier). Reality is further conceived as stratified, with hierarchically ordered strata, starting from a physical dimension, followed by chemical, biological, social and economic dimensions (Collier 1994b). All biological entities are physical, but physical structure is independent of biological structure. Similarly, the co-dependent social and economic strata are dependent upon the biological, the chemical and physical, but not vice versa. However, as consistent with the earlier discussion, higher strata are irreducible to lower from which they are emergent. Similarly, Georgescu-Roegen (2009[1979]) exemplifies such properties by considering how an elephant is composed of physical and biological structure but its behaviour (an emergent property) cannot be explained purely form physics or chemistry. As we have noted society is not simply the aggregation of the individuals of which it is composed.

This stratified and layered understanding of reality also results in a concept of causality that differs from traditional realist approaches. Instead of being explicable as event regularity, critical realism explains actualised events using the concept of causal powers of mechanisms based on structures and mechanisms (Collier 1994a). In open systems, there are multiple mechanisms at play that can either enable or prevent the actualisation of potentialities. Rather than seeking universal and timeless “laws” of Nature there are law like conditions where certain tendencies of mechanisms become actualized (Puller and Smith, 2017).

Bhaskar describes the scientific process as “the social production of knowledge by means of knowledge” (Collier, 1994a: 54). In this view, “transitive” knowledge or thought objects, provide the concepts, models and theories that are simultaneously the raw material and the product of science, and which seek to explain “intransitive” reality or real objects (Sayer, 2010). Science seeks descriptive and explanatory knowledge if natural and social entities, phenomena, events and their relationships. While social structure is subject to change it is not so easily or quickly, it has durability (Lawson, 2006), and that means the same transitive / intransitive approach to understanding knowledge can be applied. Those who emphasise change as undermining all knowledge (e.g. Goddard, Kallis and Norgaard, 2019) fail to allow for durable structure and mechanisms which are the essence of the ability to know anything. There is also a tendency to over play the role of social scientists in affecting their objects of study.

As Sayer (2010: 33) states “social scientists and historians produce interpretations of objects, but do not generally produce the objects themselves”. He argues that a clear distinction is required between an object of inquiry and our knowledge of it, which consists in the language, concepts or images that we use to describe reality. Thought objects are therefore referents to their “real” counterparts, but he regards knowledge of true correspondence as impossible, i.e. all knowledge is fallible.

Experience of the external world consists of ideas (percepts, sense data, qualia) involving socially contextual conceptualisation (e.g. language, culture, prior knowledge). The extension of knowledge involves reconceptualization and involves the role of metaphors and analogies which relate to existing ways of thinking e.g. the current prevalence of computing metaphors and analogies. The transitive or thought object in critical realism involves weak constructionism and is termed epistemic relativity or (sometimes) epistemological relativism. This weak constructionism contrast with the radical relativism of strong constructionism where knowledge is simply a matter of shared conventions among researchers. In such accounts the relation to real structures, mechanisms and objects is regarded as irrelevant or even the existence of a reality beyond the human mind is denied.

Although knowledge is fallible, it is not equally so. Choices can be and are made between difference explanations and descriptions. Representations of the world are of practical use and their employment in our actions and practices has consequences which can be evaluated, help us navigate it and enable us to have an impact on it. We judge what works well and what does not. In Sayer’s (2010: 48) terms intersubjectively shared conventions must prove themselves to be practically adequate, so that our expectations about the world and results of our actions are actually realised. This is more than just the usefulness of a theory, because the adequacy of knowledge is also judge in terms of descriptive realism relative to the structure of reality. Thus critical realism is distinct from instrumentalism (such as found in American Pragmatism) because the aim is not simply prediction but causal explanation. Prediction can be equated with explanation only if one assumes event regularity, which fails to hold in open systems like economies. Indeed, prediction is unnecessary for the explanation of a phenomenon (Collier, 1994a).

Investigation of open systems requires a distinct approach from the idealised laboratory experiment which tries to create a partially isolated system through controlling mechanisms. The limited applicability of such methods for social phenomenon means alternative methods are typically required, such as the use of counterfactuals. However, as Danemark et al. (2002b) point out, there is no specific “method of critical realism”. Indeed the method for investigation is relative to the object of study and research question. Critical realism also recognises a wider range of modes of inference than the traditional induction and deduction. It includes the roles of retroduction and abduction (see Danermark et al., 2002a), as forming part of the process of providing causal explanation, which opens up the methodological toolbox of social sciences and changes understanding of methodology as supposedly (but not actually) conducted in traditional sciences. An inference always implies a form of generalisation and can either refer to extrapolation in an empiricist sense or to conceptualisation of the “hidden essence of things” in a realist sense. Danemark et al. (2002a: 100) suggest five strategies that can help us discern the hidden underlying structures and mechanisms: (1) counterfactual thinking; (2) social experiments; (3) studies of pathological cases; (4) studies of extreme cases and (5) comparative studies.

There are also grounds for judging which methods are appropriate. Methods and related theories must be adequate to their objects of study (Puller and Smith, 2017; Spash, 2012). For example, evolutionary theory, and its associated tools for analysis, is inadequate for understanding the operation of a mechanical clock. Thus, Hodgson’s (2008) argument that evolutionary theory should replace mechanistic theory in economics is flawed because it simply repeats the same mistaken belief that all objects of relevance to economic must be of one form (i.e. evolutionary rather than mechanical). Similarly the imposition of mathematical formalism as defining economics fails not because the methods is inherently wrong but because it cannot address the object of study, i.e. the characteristics of economic systems. More specifically quantifying everything with arithmomorphic concepts excludes all qualitative aspects (Georgescu-Roegen, 2009[1979]). This indicates the need for a structured methodological pluralism, where theories and methods are informed by the qualities of the object under study and cooperation occurs between those with common understanding (Spash, 2012).

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A final aspect of note is the emancipatory role of social science research. Investigating the real (structural) cause(s) of a social phenomenon means the explanation of the social scientist will inevitably clash with the existing ideas of some people, that is new evidence may appear, theories brought into question, previously confirmed positions be undermined. Such is the nature of scientific research. Social scientists criticise those holding fallacious ideas. If there are institutions holding those false ideas then the research is also a criticism of them and the social scientists has a role in removing wrong beliefs. Collier (1994a) argues the role of the social scientist is not just to criticize but should be to undermine institutions promoting false ideas. Emancipation is then seen as transforming structure. When considering environmental research the case being made here is clear because research showing beliefs about the benefits of economic growth, fossil fuels, chemicals, plastic, asbestos, genetic modification and so on, to be false then criticise the institutions promoting such things. Research is neither neutral nor value free and facts have ethical implications for both the researcher and society.

VI. Conclusion

The multiple social, ecological and economic crises of our age, and the failings of mainstream economics to explain or address the structural causes of these crises, means new approaches to economics are essential. SEE has been outlined here as a necessary and emerging paradigm. Economics has become increasingly detached from its object of study and the orthodoxy is fundamentally flawed as a social science because it advocates a prescriptive methodology while lacking any serious engagement with epistemology and ontology. The resulting epistemic fallacy means it promotes a narrow implicit world view as if a factual truth. Failures here include imposition of limited quantitative methods and mathematically formalist methodology that exclude qualitative aspects of reality and the use of isolated/closed systems thinking for an open system reality.

Economies are the socially structured institutional process involving the interaction of humans with the natural world. Social reproduction is achieved only within the bounds of the given structure and mechanisms of biophysical reality. The form and scale of economic processes depends upon a set of spatially and temporally contextual social institutions. That is economics concerns the form and function of social provisioning process which can take various forms and are far from limited to price-making market or capitalist institutions. Starting from processes of social provisioning, economics becomes the study of plural historical, actual and potential economies with their underlying institutional arrangements and biophysical basis rather than a singular abstract idealised “economy”. This broadens analysis not only to what institutions, norms and values shape the economic process and agents’ behaviours, but also to what are socially desirable and ecologically sustainable systems of social provisioning. Economics is neither value free nor ethically neutral but its stance on both should be made explicit. It must also be realist about how economies are reproduced via social and ecological mechanisms. That means linking to both power relations and ethical and just means of provisioning, but also material and energy throughput that respects others (human and non-human). The aspirations of economists to provide for the well-being of humanity, if taken seriously, mean a revolutionary change in economics is long overdue.

#### Growth is sustainable---robust environmental progress and increasing resource reserves prove---BUT degrowth can’t save the environment either.

Andrew McAfee 20, principal research scientist at MIT, codirector of the MIT Initiative on the Digital Economy at the MIT Sloan School of Management, Doctorate from Harvard Business School, two Master of Science and two Bachelor of Science degrees from MIT, "Don't Misunderstand Earth Day's Successes," Wired, 4-22-2020, https://www.wired.com/story/opinion-dont-misunderstand-earth-days-successes/

We should all be intensely grateful to the people who took to the streets exactly 50 years ago on the first Earth Day. The modern environmental movement that crystallized then has given us a cleaner, better planet. The pressure applied to governments and businesses on April 22, 1970, has not let up since, and it has yielded two huge victories.

The first is massive reductions in the amount of pollution we and our ecosystems have to endure. In the world’s richest countries, which are the ones where environmentalism has most taken hold, the air, land, and water are all much cleaner than they were 50 years ago. This is not because these countries have simply offshored degradation to poor nations. Germany, for example, has the world’s largest trade surplus, yet has seen steady reductions in air pollution in recent decades.

If globalization is not the reason rich countries are much cleaner now than they were half a century ago, then what is? Effective regulation. The United States established the EPA and greatly strengthened the Clean Air Act in 1970, added the Clean Water Act in 1972, and kept taking steps over the years to bring down all kinds of pollution.

Some of the most innovative and helpful of these steps are cap-and-trade systems that create markets for pollution. Companies can trade with each other for the right to pollute, but the overall total is set by the government and declines over time. Over the past 30 years cap-and-trade has proved to be both relatively cheap and highly effective; a triumph of smart environmentalism.

The other great triumph is the improved health of species and ecosystems that we had pushed to the brink. Throughout the 20th century, relentless hunting almost wiped out whales. A nearly global moratorium was finally passed 1982, thanks in part to the “Save the Whales” movement that started in the mid-1970s (no doubt helped by folk superstar Judy Collins’ 1970 hit “Farewell to Tarwathie,” which introduced many people to whales’ haunting songs).

Many other species, including wolves, bears, beavers, and deer, have also come back after being near extinction in America. They rebounded in large part because we limited when, where, and how they could be hunted, and we limited trade in wild animal products. It’s generally illegal, for example, to sell hunted meat in the US. For the past 50 years, the environmental movement has carried on the laudable traditions of conservationism, which got its start early in the 20th century as Americans reacted in shock and horror to the extinction of the passenger pigeon and near elimination of the bison and other iconic animals.

Paradoxically, the great victories over pollution and extinction highlight environmentalism’s greatest weakness: a continued hostility to economic growth. The “degrowth” movement, which started in the early 1970s, stressed that human populations and economies simply couldn’t continue to grow as they had in the decades leading up to Earth Day. As philosopher André Gorz put it in 1975, “Even at zero growth, the continued consumption of scarce resources will inevitably result in exhausting them completely. The point is not to refrain from consuming more and more, but to consume less and less—there is no other way of conserving the available reserves for future generations.”

This seemed like an obvious truth to many in the 1970s, especially when they saw that the use of many natural resources—fossil fuels, metals and minerals, fertilizer, and so on—had been increasing in lockstep with the size of the overall economy. Since these resources were finite, and since their consumption went hand-in-hand with growth, growth apparently had to stop.

Yet around the world, it didn’t. The pace has slowed down a bit since the inaugural Earth Day, but this is mainly because the years between 1945 and 1970 saw exceptionally fast growth as we rebuilt our societies after two world wars. Except for that 25-year stretch, economic growth since 1970 is the fastest the world has ever seen.

So how are natural resource stocks doing? Oil is a great indicator of the overall story (its recent pandemic-induced demand free fall notwithstanding). At present we have about 50 years of oil left, given projected consumption and known reserves. That sounds dire, until you realize that 40 years ago, we only had 30 years of oil left. How can this be? It’s certainly not because we’ve cut way back on oil demand; we consume almost 40 percent more oil now than we did in 1980.

It’s because we kept finding more supplies. The same is true for every other economically important natural resource. Proven reserves—the amount of the resource we know we can access—have increased as we keep developing better technologies for finding and accessing them. And because the supply-demand balance keeps getting more favorable, resource affordability increases. The world’s average worker can, with an hour of their labor, purchase a greater quantity of every important resource than was the case just a few decades ago.

We live on a finite planet, but an incredibly abundant one. It contains enough of everything we need for as long as we’ll be around. Especially since, in the decades and centuries to come, we clever humans will almost certainly figure out nuclear fusion or some other technology that gives us limitless clean energy and lets us ignore fossil fuels. In short, there’s no need to slam the brakes on our growth. This happy fact is deeply counterintuitive, and it trips a lot of people up. But the evidence is clear: Degrowth is unnecessary.

In fact, it’s a terrible idea. Recall that the countries that have cleaned up their environments the most since Earth Day are the richest ones. This is not a coincidence, as Indira Gandhi knew in 1972. In a speech given in Stockholm, she said “Are not poverty and need the greatest polluters?... The environment cannot be improved in conditions of poverty.” Prosperous people and societies can afford, in every sense of the word, to care about the state of the planet we all live on, and to improve it.

Economic growth does not irreversibly degrade and deplete the planet. Instead, economic growth yields more prosperous people, who demand to live in a better world—a world with less pollution and more healthy ecosystems. The 50 years since Earth Day have largely shown that they get what they want.

The Covid-19 recession has given us much cleaner air in cities around the world, but at a terrible cost. We don’t need to endure such hardship to reduce emissions from car traffic. If we just made pollution more expensive and energy and transport innovation cheaper (via subsidies or research funding), we’d get the same clean skies without any economic devastation at all.

We face no shortage of environmental challenges over the next 50 years. We continue to overhunt, overfish, and raze ecosystems in many parts of the world. More extinctions loom. And of course we have to reduce the greenhouse gas pollution that’s causing global warming. The good news is that, in the decades since Earth Day, we’ve put together an effective playbook for meeting these challenges. I hope the environmentalists of the coming half-century will study this playbook, and realize that it shuns degrowth rather than advocating it.

#### NETs link turns their impact.

Fred Krupp et al. 19. Nathaniel [Keohane](https://search-proquest-com.libproxy2.usc.edu/indexinglinkhandler/sng/au/Keohane,+Nathaniel/$N?accountid=14749), and Eric Pooley. \*President of Environmental Defense Fund, a United States-based nonprofit environmental advocacy group. \*\*Vice president for international climate at the Environmental Defense Fund. He used to be in academia at Yale University and served in the White House as special assistant to President Barack Obama. \*\*\*Senior Vice President, Strategy & Communications at the Environmental Defense Fund. 4-1-2019. "Less Than Zero: Can Carbon-Removal Technologies Curb Climate Change?" Foreign Affairs. https://search-proquest-com.libproxy2.usc.edu/docview/2186099162/594BA6C689D844ABPQ/13?accountid=14749/.

When it comes to generating support for climate policy, a warranted sense of alarm is only half the battle. And the other half-a shared belief that the problem is solvable-is lagging far behind. The newfound sense of urgency is at risk of being swamped by collective despair. A scant six percent of Americans, according to the Yale study, believe that the world "can and will" effectively address climate change. With carbon dioxide emissions from fossil fuels having risen by an estimated 2.7 percent in 2018 and atmospheric concentrations of carbon dioxide, which will determine the ultimate extent of warming, at their highest level in some three million years, such pessimism may seem justified-especially with a climate change denier in the White House. But it is not too late to solve the global climate crisis. A decade of extraordinary innovation has made the greening of the global economy not only feasible but also likely. The market now favors clean energy: in many U.S. states, it is cheaper to build new renewable energy plants than to run existing coal-fired power plants. By combining solar power with new, efficient batteries, Arizona and other sunny states will soon be able to provide electricity at a lower cost per megawatthour than new, efficient natural gas plants. Local, regional, and federal governments, as well as corporations, are making measurable progress on reducing carbon pollution. Since 2000, 21 countries have reduced their annual greenhouse gas emissions while growing their economies; China is expected to see emissions peak by 2025, five years earlier than it promised as part of the negotiations for the Paris climate agreement in 2015. At the UN climate talks held late last year in Poland, countries agreed on rules for how to report progress on meeting emission-reduction commitments, an important step in implementing the Paris accord. What's more, an entirely new arsenal is emerging in the fight against climate change: negative emission technologies, or nets. Nets are different from conventional approaches to climate mitigation in that they seek not to reduce the amount of greenhouse gases emitted into the atmosphere but to remove carbon dioxide that's already there. These technologies range from the old-fashioned practice of reforestation to high-tech machines that suck carbon out of the sky and store it underground. The window of opportunity to combat climate change has not closed-and with a push from policymakers, nets can keep it propped open for longer. THE HEAT IS ON How much time is left to avoid climate catastrophe? The truth is that it is impossible to answer the question with precision. Scientists know that human activity is warming the planet but still don't fully understand the sensitivity of the climate system to greenhouse gases. Nor do they fully comprehend the link between average global warming and local repercussions. So far, however, most effects of climate change have been faster and more severe than the climate models predicted. The downside risks are enormous; the most recent predictions, ever more dire. The Paris agreement aims to limit the increase in global average temperatures above preindustrial levels to well below two degrees Celsius, and ideally to no more than 1.5 degrees Celsius. Going above those levels of warming would mean more disastrous impacts. Global average temperatures have already risen by about one degree Celsius since 1880, with two-thirds of that increase occurring after 1975. An October 2018 special report by the un's Intergovernmental Panel on Climate Change, a body of leading scientists and policymakers from around the world, found that unless the world implements "rapid and far-reaching" changes to its energy and industrial systems, the earth is likely to reach temperatures of 1.5 degrees Celsius above preindustrial levels sometime between 2030 and 2052. Limiting warming to that level, the ipcc found, would require immediate and dramatic cuts in carbon dioxide: roughly a 45 percent reduction in the next dozen years. Even meeting the less ambitious target of two degrees would require deep cuts in emissions by 2030 and sustained aggressive action far beyond then. The ipcc report also warns that seemingly small global temperature increases can have enormous consequences. For example, the half-degree difference between 1.5 degrees Celsius and two degrees Celsius of total warming could consign twice as many people to water scarcity, put ten million more at risk from rising sea levels, and plunge several hundred million more people into poverty as lower yields of key crops drive hunger across much of the developing world. At two degrees of warming, nearly all of the planet's coral reefs are expected to be lost; at 1.5 degrees, ten to 30 percent could survive. The deeper message of the IPCC report is that there is no risk-free level of climate change. Targets such as 1.5 degrees Celsius or two degrees Celsius are important political markers, but they shouldn't fool anyone into thinking that nature works so precisely. Just as the risks are lower at 1.5 degrees Celsius than at two degrees Celsius, so are they lower at two degrees Celsius than at 2.5 degrees Celsius. Indeed, the latter difference would be far more destructive, since the damages mount exponentially as temperatures rise. To manage the enormous risks of climate change, global emissions of greenhouse gases need to be cut sharply, and as soon as possible. That will require transforming energy, land, transport, and industrial systems so they emit less carbon dioxide. It will also require reducing short-lived climate pollutants such as methane, which stay in the atmosphere for only a fraction of the time that carbon dioxide does but have a disproportionate effect on near-term warming. Yet even that will not be enough. To stabilize the total atmospheric concentration of carbon dioxide and other greenhouse gases [GHGs], the world will have to reach net negative emissions-that is, taking more greenhouse gases out of the atmosphere than are being pumped into it. Achieving that through emission reductions alone will be extremely difficult, since some emissions, such as of methane and nitrous oxide from agriculture, are nearly impossible to eliminate. Countering the emissions that are hardest to abate, and bring concentrations down to safer levels, requires technologies that actually remove carbon dioxide from the atmosphere. That's where nets come in-not as a substitute for aggressive efforts to reduce greenhouse gas emissions but as a complement. By deploying technology that removes existing carbon dioxide from the atmosphere, while accelerating cuts in emissions, the world can boost its chances of keeping warming below two degrees and reduce the risk of catastrophe. Scientists and activists have tended to regard these technologies as a fallback option, to be held in reserve in case other efforts fail. Many fear that jumping ahead to carbon dioxide removal will distract from the critical need to cut pollution. But the world no longer has the luxury of waiting for emission-reduction strategies to do the job alone. Far from being a Plan B, nets must be a critical part of Plan A. What's more, embracing nets sooner rather than later makes economic sense. Because the marginal costs of emission reductions rise as more emissions are cut, it will be cheaper to deploy nets at the same time as emission-reduction technologies rather than waiting to exhaust those options first. The wider the solution set, the lower the costs. And the lower the costs, the easier it is to raise ambitions and garner the necessary political support. THE FUTURE IS NOW Even though removing carbon dioxide from the atmosphere may sound like the stuff of science fiction, there are already nets that could be deployed at scale today, according to a seminal report released by the National Academies of Sciences, Engineering, and Medicine in October 2018. One category involves taking advantage of carbon sinks-the earth's forests and agricultural soils, which have soaked up more carbon dioxide since the Industrial Revolution than has been released from burning petroleum. To date, the growth of carbon sinks has been inadvertent: in the United States, for example, as agriculture shifted from the rocky soils of the Northeast to the fertile Midwest, forests reclaimed abandoned farmland, breathing in carbon dioxide in the process. But this natural process can be improved through better forest management-letting trees grow longer before they are harvested and helping degraded forests grow back more quickly. The large-scale planting of trees in suitable locations around the world could increase carbon sinks further, a process that must go hand in hand with efforts to curb tropical deforestation and thereby continue to contain the vast amounts of carbon already stored in the earth's rainforests. Farmland provides additional potential for negative emissions. Around the world, conventional agricultural practices have reduced the amount of carbon in soils, decreasing their fertility in the process. Smarter approaches can reverse the process. Small and large landholders alike could add agricultural waste to soil, maximize the time that the soil is covered by living plants or mulch, and reduce tilling, which releases carbon dioxide. All these steps would decrease the amount of carbon that is lost from soil and increase the amount of carbon that is stored in it. The most technologically sophisticated net available in the near term is known as "bioenergy with carbon capture and storage," or BECCS. It is also the riskiest. Broadly defined, beccs involves burning or fermenting biomass, such as trees or crops, to generate electricity or make liquid fuel; capturing the carbon dioxide produced in the process; and sequestering it underground. It is considered a negative emission technology, and not a zero emission technology, because growing the biomass used in the process removes carbon from the atmosphere. What makes BECCS so exciting is its potential to remove significantly more carbon from the atmosphere than other approaches do. But it also brings challenges. For one, it is expensive: electricity generated from beccs could cost twice as much as that generated with natural gas, because biomass is an inefficient fuel source and capturing and sequestering carbon dioxide is costly. The technology would also require careful monitoring to ensure that the carbon dioxide pumped underground stays there and clear rules for legal liability in the event of leaks. But the fact that private companies have been successfully injecting carbon dioxide into depleted oil and gas reservoirs for decades offers good evidence that permanent storage is possible on a large scale. More worrying are the additional climate risks that BECCS poses. If BECCS drives demand for biomass and more of the carbon that is stored in the forest ecosystem is released as a result, it could end up raising the level of carbon in the atmosphere rather than reducing it. Another concern is competition for land: converting farms or forests to grow energy crops, something that the large-scale use of BEccs might require, could drive up the cost of food, reduce agricultural production, and threaten scarce habitats. These problems could be mitigated by using only biomass waste, such as residues from logging and agriculture, but that would reduce the potential scale. Although BEccs deserves consideration as part of the arsenal, these risks mean that its contribution will likely end up being smaller than some proponents claim. Taking all these land-based nets together, and factoring in the considerable economic, practical, and behavioral hurdles to bringing them to scale, the National Academies report concludes that by midcentury, nets could remove as much as five billion tons of carbon dioxide from the atmosphere annually. Given the significant risks involved, that estimate is probably too bullish. Even if it were not, that's still only half of the ten billion tons of carbon dioxide that will likely need to be removed each year to zero out the remaining greenhouse gas emissions, even with aggressive cuts. CLOSING THE GAP Removing from the atmosphere the balance of the carbon dioxide necessary will require perfecting technologies currently in development. Two deserve particular mention; both are full of promise, although neither is ready for widespread use. The first is called "direct air capture"- essentially, sucking carbon from the sky. The technology is already being tested in Canada, Iceland, Italy, and Switzerland at pilot plants where massive arrays of fans direct a stream of air toward a special substance that binds with the passing carbon dioxide. The substance is then either heated or forced into a vacuum to release the carbon dioxide, which is compressed and either stored or used as feedstocks for chemicals, fuels, or cement. These technologies are real-albeit prohibitively expensive in their current form. As a recent study led by David Sandalow of Columbia University's Center on Global Energy Policy concludes, taking them to scale means solving a variety of technological challenges to bring down the costs. Above all, these processes are highly energy intensive, so scaling them would require enormous amounts of low-carbon electricity. (A direct-air-capture facility powered by coal-fired electricity, for example, would generate more new carbon dioxide than it would capture.) These obstacles are serious, but the surprising progress of the past decade suggests that they can be overcome in the next one. The second technology, enhanced carbon mineralization, is even further from being realized, but it is full of even more possibility. Geologists have long known that when rock from the earth's mantle (the layer of the earth between its crust and its core) is exposed to the air, it binds with carbon dioxide to form carbon-containing minerals. The massive tectonic collisions that formed the Appalachian Mountains around 460 million years ago, for example, exposed subsurface rock to weathering that resulted in the absorption of substantial amounts of carbon dioxide from the atmosphere. That took tens of millions of years; enhanced carbon mineralization seeks to fast-forward the process. Scientists are exploring two ways to do this. In one approach, rocks would be brought to the surface to bind with carbon from the air. Such natural weathering already occurs in mine tailings, the waste left over from certain mining operations. But mimicking this process on a large scale-by grinding up large quantities of rock containing reactive minerals and bringing it to the earth's surface-would be highly energy intensive and thus costly, roughly on par with direct air capture. Another potential approach is pumping the carbon dioxide underground to meet the rock. As the National Academies report explains, carbon-dioxide-rich fluids injected into basalt or peridotite formations (two kinds of igneous rock that make up much of the earth's mantle) react with the rock, converting the dissolved carbon dioxide into solid carbon-containing minerals. Pilot projects in Iceland and the United States have demonstrated that this is possible. There is also evidence for how this could work in the natural world. Peridotite usually lies deep inside the earth, but some rock formations around the globe contain pockets of it on the surface. For example, scientists are studying how the surface-level peridotite in Oman's rock formations reacts with the air and absorbs large amounts of carbon. In theory, this approach offers nearly unlimited scale, because suitable rock formations are widespread and readily accessible. It would also be cheap, because it takes advantage of chemical potential energy in the rock instead of costly energy sources. And since the carbon dioxide is converted to solid rock, the effect is permanent, and it carries few of the side effects that other nets could bring. GETTING TO LESS These technologies do not come cheap. The National Academy of Sciences recommends as much as $1 billion annually in U.S. government funding for research on nets. And indeed, such funding should be an urgent priority. But to make these technologies economically viable and scale them rapidly, policymakers will also have to tap into a much more powerful force: the profit motive. Putting a price on carbon emissions creates an economic incentive for entrepreneurs to find cheaper, faster ways to cut pollution. Valuing negative emissions-for example, through an emission-trading system that awards credits for carbon removal or a carbon tax that provides rebates for them-would create an incentive for them to join the hunt for nets. Forty-five countries, along with ten U.S. states, have put in place some mechanism to price carbon. But only a handful of them offer rewards for converting land into forest, managing existing forests better, or increasing the amount of carbon stored in agricultural soils, and none offers incentives for other nets. What's needed is a carbon pricing system that not only charges those who emit carbon but also pays those who remove it. Such a system would provide new revenue streams for landowners who restored forest cover to their land and for farmers and ranchers who increased the amount of carbon stored in their soils. It would also reward the inventors and entrepreneurs who developed new, better technologies to capture carbon from the air and the investors and businesses that took them to scale. Without these incentives, those players will stay on the sidelines. By spurring innovation in lower-cost nets, incentives would also ease the way politically for an ambitious pollution limit-which, ultimately, is necessary for ensuring that the world meets it climate goals. Simply put, humanity's best hope is to promise that the next crop of billionaires will be those who figure out low-cost ways to remove carbon from the sky. The biggest hurdle for such incentives is the lack of a global market for carbon credits. Hope on that front, however, is emerging from an unlikely place: aviation. Currently responsible for roughly two percent of global greenhouse gases, aviation's emissions are expected to triple or quadruple by midcentury in the absence of effective policies to limit them. But in 2016, faced with the prospect that the eu would start capping the emissions of flights landing in and taking off from member states, the un body that governs worldwide air travel, the International Civil Aviation Organization, agreed to cap emissions from international flights at 2020 levels. The airline industry supported the agreement, hoping to avoid the messy regulatory patchwork that might result if the eu went ahead and states beyond the eu followed suit with their own approaches. The resulting program, called the Carbon Offsetting and Reduction Scheme for International Aviation (corsia), requires all airlines to start reporting emissions this year, and it will begin enforcing a cap in 2021. Once in full swing, at least 100 countries are expected to participate, covering at least three-quarters of the forecast increase in international aviation emissions. Airlines flying between participating countries will have two ways to comply: they can lower their emissions (for example, by burning less fuel or switching to alternative fuels), or they can buy emission-reduction credits from companies. Because the technologies for reducing airline emissions at scale are still a long way off, the industry will mostly choose the second option, relying on carbon credits from reductions in other sectors. It is estimated that over the first 15 years of corsia, demand for these credits will reach between 2.5 billion and 3.0 billion tons-roughly equal to the annual greenhouse gas emissions from the U.S. power and manufacturing sectors. With this new option to sell emission-reduction credits to airlines, there is a good possibility that a pot of gold will await companies that cut or offset their carbon emissions. In short, corsia could catalyze a global carbon market that drives investment in low-carbon fuels and technologies-including nets. To realize its promise, corsia must be implemented properly, and there are powerful forces working to see that it is not. Some countries, including ones negotiating on behalf of their state-owned companies, are trying to rig the system by allowing credits from projects that do not produce legitimate carbon reductions, such as Brazil's effort to allow the sale of credits from huge hydroelectric dams in the Amazon that have already been built and paid for (and thus do not represent new reductions). Allowing such credits into the system could crowd out potential rewards for genuine reductions. But there are also powerful, sometimes unexpected allies who stand to gain from a global carbon market that works. For example, some airlines are motivated to act out of a fear that millennials, concerned about their carbon footprint, may eventually begin to shun air travel. The new regulations, by creating demand for emission reductions and spurring investment in nets to produce jet fuel, could be the industry's best hope of protecting its reputation-and a critical step toward a broader global carbon market that moves nets from promising pilot projects to a gamechanging reality. Skeptics say that nets are too speculative and a possibility only, perhaps, in the distant future. It is true that these innovations are not fully understood and that not all of them will pan out. But no group of scholars and practitioners, no matter how expert, can determine exactly which technologies should be deployed and when. It is impossible to predict what future innovations will look like, but that shouldn't stop the world from pursuing them, especially when the threat is so grave. The fact remains that many nets are ready to be deployed at scale today, and they might make the difference between limiting warming to two degrees and failing to do so. Ultimately, climate change will be stopped by creating economic incentives that unleash the innovation of the private sector-not by waiting for the perfect technology to arrive ready-made, maybe when it's already too late. No one is saying that achieving all of this will be easy, but the road to climate stability has never been that. Hard does not mean impossible, however, and the transformative power of human ingenuity offers an endless source of hope.

#### It’s too ingrained for the ALT to change.

Thomas Wiedmann et al. 20, Sustainability Assessment Program, School of Civil and Environmental Engineering, UNSW Sydney; Manfred Lenzen, ISA, School of Physics, The University of Sydney; Lorenz T. KeyßEr, Institute for Environmental Decisions, Department of Environmental Systems Science, ETH Zürich; Julia K. Steinberger, Sustainability Research Institute (SRI), School of Earth and Environment, University of Leeds, "Scientists’ Warning on Affluence," Nature Communications, Vol. 11, 06/19/2020, Springer.

Growth imperatives are active at multiple levels, making the pursuit of economic growth (net investment, i.e. investment above depreciation) a necessity for different actors and leading to social and economic instability in the absence of it7,52,60. Following a Marxian perspective as put forward by Pirgmaier and Steinberger61, growth imperatives can be attributed to capitalism as the currently dominant socio-economic system in affluent countries7,51,62, although this is debated by other scholars52. To structure this topic, we will discuss different affected actors separately, namely corporations, states and individuals, following Richters and Siemoneit60. Most importantly, we address the role of the super-affluent consumers within a society, which overlap with powerful fractions of the capitalist class. From a Marxian perspective, this social class is structurally defined by its position in the capitalist production process, as financially tied with the function of capital63. In capitalism, workers are separated from the means of production, implying that they must compete in labour markets to sell their labour power to capitalists in order to earn a living.

Even though some small- and medium-sized businesses manage to refrain from pursuing growth, e.g. due to a low competition intensity in niche markets, or lack of financial debt imperatives, this cannot be said for most firms64. In capitalism, firms need to compete in the market, leading to a necessity to reinvest profits into more efficient production processes to minimise costs (e.g. through replacing human labour power with machines and positive returns to scale), innovation of new products and/or advertising to convince consumers to buy more7,61,62. As a result, the average energy intensity of labour is now twice as high as in 195060. As long as a firm has a competitive advantage, there is a strong incentive to sell as much as possible. Financial markets are crucial to enable this constant expansion by providing (interest-bearing) capital and channelling it where it is most profitable58,61,63. If a firm fails to stay competitive, it either goes bankrupt or is taken over by a more successful business. Under normal economic conditions, this capitalist competition is expected to lead to aggregate growth dynamics7,62,63,65.

However, two factors exist that further strengthen this growth dynamic60. Firstly, if labour productivity continuously rises, then aggregate economic growth becomes necessary to keep employment constant, otherwise technological unemployment results. This creates one of the imperatives for capitalist states to foster aggregate growth, since with worsening economic conditions and high unemployment, tax revenues shrink, e.g. from labour and value-added taxes, while social security expenditures rise60,62. Adding to this, states compete with other states geopolitically and in providing favourable conditions for capital, while capitalists have the resources to influence political decisions in their favour. If economic conditions are expected to deteriorate, e.g. due to unplanned recession or progressive political change, firms can threaten capital flight, financial markets react and investor as well as consumer confidence shrink51,58,60. Secondly, consumers usually increase their consumption in tune with increasing production60. This process can be at least in part explained by substantial advertising efforts by firms47,52,66. However, further mechanisms are at play as explained further below.

Following this analysis, it is not surprising that the growth paradigm is hegemonic, i.e. the perception that economic growth solves all kinds of societal problems, that it equals progress, power and welfare and that it can be made practically endless through some form of supposedly green or sustainable growth59. Taken together, the described dynamics create multiple dependencies of workers, firms and states on a well-functioning capital accumulation and thus wield more material, institutional and discursive power (e.g. for political lobbying) to capitalists who are usually the most affluent consumers61,67. Even if different fractions of the capitalist class have manifold and competing interests which need to be constantly renegotiated, there is a common interest in maintaining the capitalist system and favourable conditions for capital accumulation, e.g. through aggregate growth and high consumption51,62. How this political corruption by the super-affluent plays out in practice is well documented, e.g. for the meat industry in Denmark6.

Super-affluent consumers drive consumption norms

Growth imperatives and drivers (with the latter describing less coercive mechanisms to increase consumption) can also be active at the individual level. In this case, the level of consumption can serve as a proxy47,60,68. To start with, individual consumption decisions are not made in a vacuum, but are shaped by surrounding (physical and social) structures and provisioning systems47,61,69. Sanne66 and Alexander47 discuss several structural barriers to sufficiency-oriented lifestyles, locking in high consumption. These include lack of suitable housing, insufficient options for socialising, employment, transport and information, as well as high exposure to consumer temptations. Often, these conditions are deliberately fostered by states and also capitalists (the latter overlapping with super-affluent consumers and having disproportionate influence on states) to increase consumption61,66.

Further active mechanisms to spur growth include positional and efficiency consumption, which contribute to an increase in consumption overall52,60,68,70. After basic material needs are satisfied, an increasing proportion of consumption is directed at positional goods52,70. The defining feature of these goods is that they are expensive and signify social status. Access to them depends on the income relative to others. Status matters, since empirical studies show that currently relative income is one of the strongest determinants of individual happiness52. In the aggregate however, the pursuit of positional consumption, driven by super-affluent consumers and high inequalities, likely resembles a zero-sum game with respect to societal wellbeing70,71. With every actor striving to increase their position relative to their peers, the average consumption level rises and thus even more expensive positional goods become necessary, while the societal wellbeing level stagnates42,71. This is supported by a large body of empirical research, showing that an individual’s happiness correlates positively with their own income but negatively with the peer group’s income71 and that unequal access to positional goods fosters rising consumption52. This endless process is a core part of capitalism as it keeps social momentum and consumption high with affluent consumers driving aspirations and hopes of social ascent in low-affluence segments70,72. The positional consumption behaviour of the super-affluent thus drives consumption norms across the population, for instance through their excessive air travel, as documented by Gössling73.

Lastly, in capitalism, workers must compete against each other in the labour market in order to earn a living from capitalists7,63. Following Siemoneit68, this can lead to a similar imperative to net invest (increase the level of consumption/investment) as is observed with capitalists. In order to stay competitive, individuals are pushed to increase time and cost efficiency by investing in cars, kitchen appliances, computers and smartphones, by using social media and online trade etc. This efficiency consumption—effectively another facet of the rebound effect38,47,68—helps to manage high workloads, thus securing an income, while maintaining private life. This is often accompanied by trends of commodification61, understood as the marketisation of products and services which used to be provisioned through more time-intensive commons or reciprocal social arrangements, e.g. convenience food vs. cooking together. As in the food example74, this replacement of human labour with energy- and material-intensive industrial production typically increases environmental pressures47,75. Through these economic pressures, positive feedback loops and lock-ins are expected to emerge, since other consumers need to keep up with these investments or face disadvantages, e.g. when car or smartphone ownership become presupposed. Taken together with positional consumption, structural barriers to sufficiency and the substantial advertising efforts by capitalists, these mechanisms explain to a large extent why consumers seem so willing to increase their consumption in accordance with increasing production60.

#### Cap net reduces war

Mousseau 19—Professor in the School of Politics, Security, and International Affairs at the University of Central Florida (Michael, “The End of War: How a Robust Marketplace and Liberal Hegemony Are Leading to Perpetual World Peace,” International Security, Volume 44, Issue 1, Summer 2019, p.160-196, dml)

Is war becoming obsolete? There is wide agreement among scholars that war has been in sharp decline since the defeat of the Axis powers in 1945, even as there is little agreement as to its cause.1 Realists reject the idea that this trend will continue, citing states' concerns with the “security dilemma”: that is, in anarchy states must assume that any state that can attack will; therefore, power equals threat, and changes in relative power result in conflict and war.2 Discussing the rise of China, Graham Allison calls this condition “Thucydides's Trap,” a reference to the ancient Greek's claim that Sparta's fear of Athens' growing power led to the Peloponnesian War.3

This article argues that there is no Thucydides Trap in international politics. Rather, the world is moving rapidly toward permanent peace, possibly in our lifetime. Drawing on economic norms theory,4 I show that what sometimes appears to be a Thucydides Trap may instead be a function of factors strictly internal to states and that these factors vary among them. In brief, leaders of states with advanced market-oriented economies have foremost interests in the principle of self-determination for all states, large and small, as the foundation for a robust global marketplace. War among these states, even making preparations for war, is not possible, because they are in a natural alliance to preserve and protect the global order. In contrast, leaders of states with weak internal markets have little interest in the global marketplace; they pursue wealth not through commerce, but through wars of expansion and demands for tribute. For these states, power equals threat, and therefore they tend to balance against the power of all states. Fearing stronger states, however, minor powers with weak internal markets tend to constrain their expansionist inclinations and, for security reasons, bandwagon with the relatively benign market-oriented powers.

I argue that this liberal global hierarchy is unwittingly but systematically buttressing states' embrace of market norms and values that, if left uninterrupted, is likely to culminate in permanent world peace, perhaps even something close to harmony. My argument challenges the realist assertion that great powers are engaged in a timeless competition over global leadership, because hegemony cannot exist among great powers with weak markets; these inherently expansionist states live in constant fear and therefore normally balance against the strongest state and its allies.5 Hegemony can exist only among market-oriented powers, because only they care about global order. Yet, there can be no competition for leadership among market powers, because they always agree with the goal of their strongest member (currently the United States) to preserve and protect the global order based on the principle of self-determination. If another commercial power, such as a rising China, were to overtake the United States, the world would take little notice, because the new leading power would largely agree with the global rules promoted and enforced by its predecessor. Vladimir Putin's Russia, on the other hand, seeks to create chaos around the world. Most other powers, having market-oriented economies, continue to abide by the hegemony of the United States despite its relative economic decline since the end of World War II.6

To support my theory that domestic factors determine states' alignment decisions, I analyze the voting preferences of members of the United Nations General Assembly from 1946 to 2010. I find that states with weak internal markets tend to disagree with the foreign policy preferences of the largest market power (i.e., the United States), but more so if they are major powers or have stronger rather than weaker military and economic capabilities. The power of states with robust internal markets, in contrast, appears to have no effect on their foreign policy preferences, as market-oriented states align with the market leader regardless of their power status or capabilities. I corroborate that this pattern may be a consequence of states' interest in the global market order by finding that states with higher levels of exports per capita are more likely than other states to have preferences aligned with those of the United States; those with lower levels of exports are more likely to have interests that do not align with the United States, but again more so if they are stronger rather than weaker.

Liberal scholars of international politics have long offered explanations for why the incidence of war may decline, generally beginning with the assumption that although the security dilemma exists, it can be overcome with the help of factors external to states.7 Neoliberal institutionalists treat states as like units and international organization as an external condition.8 Trade interdependence is dyadic and thus an external condition.9 Democracy is an internal factor, but theories of democratic peace have an external dimension: peace is the result of the expectations of states' behavior informed by the images that leaders create of each other's regime types.10 In contrast, I show that the security dilemma may not exist at all and how peace can emerge in anarchy with states pursuing their interests determined entirely by internal factors.11

### States CP---2AC

#### It fails---patchwork implementation muddies the plan’s signal, causes capture, and leads to duplication.

Jacob P. Grosso 21, J.D. Candidate at the University of Richmond School of Law and B.A. from George Mason University, “The Preemption of Collective State Antitrust Enforcement in Telecommunications”, University of Richmond Law Review, 55 U. Rich. L. Rev. 615, Winter 2021, Lexis

A. Benefits of Preempting Collective State Action

Preemption would result in cognizable benefits to the regulatory and business spheres. These benefits would include clear guidance, increased enforcement efficiencies, and the ability to pursue nonenforcement agendas and broader policy goals.236 Businesses would receive clear guidance on the legality of their business choices. State antitrust enforcers would redeploy costs to state-specific issues. Federal enforcers would be able to effectively pursue broader policy goals.

Consolidated enforcement and regulatory schemes would provide clarity to businesses through more uniform regulations and decreased litigation concerns. This consolidation, in turn, would reduce costs for the government and the competitors while encouraging competition and unnecessary compliance costs.237 Clear regulations serving a common goal, without the inherent biases of individual state interests, can provide clarity to businesses and preserve the balancing of consumer welfare with the aggregate social welfare. Individual states make decisions based on their individual needs, as seen in the T-Mobile-Sprint merger.238 When federal law conflicts with state law, federal law controls.239 Despite this standard, multistate task forces continue to come forward as the interpreters of federal law.240 This approach poses problems because of the inherent state biases that underlie the enforcement actions. Preemption could decrease the effects of individual state biases on the guidance given to competitors.

Antitrust analysis considers geographic differences in determining the concentration of a market, meaning a one-size-fits-all approach does not work for aggregating individual state markets.241 This restructuring would reduce the effects of an individual state’s interests on collective action.242 While any individual state may be best served by one plan, the economy as a whole might suffer for that decision.243 “Divergent approaches to the exercise of enforcement discretion are not just possible, they are likely.”244 States likely face pressure from several groups that can influence their enforcement decisions, as well as the selfish motivation to protect their consumers regardless of the cost to national welfare.245 Uniform, clear guidance at the federal level, without state interference, will reduce opportunities for the individual motivations of states to negatively impact a clear enforcement scheme. Adding states as parties to a telecommunications antitrust lawsuit complicates the suit by increasing the number of parties that must agree to a settlement.246 The effects of the preemption and resulting enforcement system will create efficiencies for federal and state enforcers, as well as for businesses. For telecommunications antitrust enforcement actions, this will limit costs to the federal agencies, prevent the duplication of effort (in reviewing transactions), and eliminate the costs of coordination that NAAG multistate enforcement teams face.247 Extending even beyond telecommunications, this results in a net positive for the antitrust sections of state attorneys general offices to redeploy resources to monitor and combat anticompetitive behavior in the state-specific areas that these sections were designed to handle.248

The reduced litigation could represent a net positive for both state governments and competitors. Even responding to discovery requests from one state can cost two to nine million dollars.249 Dealing with multiple suits, as in the T-Mobile-Sprint merger, causes a compounding of these costs resulting from duplication of effort. For T-Mobile, the firm has now faced multiple reviews concerning the same issues that it believed it had resolved. The FCC review alone took 317 days.250 In total, from the initial merger review submission on April 28, 2018, until April 1, 2020, it took two years to close the transaction.251 The T-Mobile-Sprint merger exemplifies how further delays can slow the competitor’s ability to continue with business, as it must divert attention to compliance and litigation efforts. 252

#### Gets struck down via the DCC, CC, AND Supremacy Clause.

Daniel A. Lyons 19, Professor at Boston College Law School, “State Net Neutrality”, Summer 2019, 80 U. Pitt. L. Rev. 905, Lexis

D. Dormant Commerce Clause

Independent of the Communications Act, state regulation of the Internet may also run afoul of the Dormant Commerce Clause. The Dormant Commerce Clause doctrine prevents states from imposing undue burdens on interstate commerce. It is a judge-made doctrine, derived from the negative implication of the Constitution's grant to Congress of the power to regulate commerce between the states. 245 Its "central rationale . . . is to prohibit state or municipal laws whose object is local economic protectionism." 246 Thus, state laws that explicitly discriminate against [\*941] interstate commerce face "a virtually per se rule of invalidity." 247 But even a facially nondiscriminatory state law may nonetheless run afoul of the doctrine if it unduly burdens interstate commerce. Courts evaluate such claims under the test announced in Pike v. Bruce Church: "Where the statute regulates even-handedly to effectuate a legitimate local public interest, and its effects on interstate commerce are only incidental, it will be upheld unless the burden imposed on such commerce is clearly excessive in relation to the putative local benefits." 248

The Pike balancing test played an important role in shaping early Internet regulation, because of concern about spillover effects when states regulate online conduct. In the prominent case of American Library Association v. Pataki, a district court struck down a New York law that prohibited the intentional use of the Internet to send pornographic messages that would be "harmful to minors." 249 The court conceded that shielding New York minors from pornography constituted a legitimate state interest. 250 But it found this interest was outweighed by the significant chilling effect the law would have on wholly out-of-state conduct. 251 Because information posted to the Internet is available everywhere simultaneously, those who disseminate information online could face liability for posting content that arguably ran afoul of New York's law, even if they had no intention of communicating with New York residents. 252 this, in turn, would chill communication to recipients in states where the content was legal, thus imposing an undue burden on interstate commerce far in excess of what little local benefits were likely to result from enforcement. 253

Like many balancing tests, the doctrine is somewhat unpredictable, turning on the facts of individual cases. Many state regulations create spillover effects; the Dormant Commerce Clause only invalidates those that, in the court's judgment, impose a greater burden on interstate commerce than they reap in local benefit--which can differ from case to case. For example, in National Federation of the Blind [\*942] v. Target Corp., 254 Target argued that California's disability law burdened interstate commerce by requiring it to modify a nationwide website to meet California requirements--which effectively imposed California law on the company's transactions with all customers, even those outside California. 255 The court found this argument was premature at the motion to dismiss stage, explaining that Target could develop a California-specific website, and even if it chose not to do so, its decision to develop one product for a nationwide market does not necessarily implicate the Commerce Clause. 256 At a minimum, factual development was necessary to determine the "practical effect" of the law on interstate commerce before the court could decide the Dormant Commerce Clause issue. 257

National Federation of the Blind's focus on practical effects reflects the insights of Professors Jack Goldsmith and Alan Sykes, whose seminal Yale Law Journal article, The Internet and the Dormant Commerce Clause, brought some clarity to this somewhat confusing corner of the law. 258 Goldsmith and Sykes highlight that the primary justification for the Dormant Commerce Clause is to "ensure[] free trade among the states and thereby secure[] the associated economic benefits." 259 They thus support the consideration of economic efficiency as the lodestar for such claims: "[T]he appropriate statement of the extraterritoriality concern is that states may not impose burdens on out-of-state actors that outweigh the in-state benefits." 260

A full application to broadband regulation is beyond the scope of this article. But it is worth noting that like early state attempts to regulate online conduct, state-level network traffic management regulations are susceptible to a Dormant Commerce Clause challenge. The Internet is a national (indeed, global) network, meaning that attempts to regulate the flow of traffic on that network are likely to have extraterritorial effects. If state net neutrality rules survive a preemption analysis, states should be ready for the claim that such regulations unreasonably burden [\*943] interstate commerce and, therefore, contravene the Dormant Commerce Clause doctrine.

#### The FTC AND the federal government are key to effective signaling AND coordination.

Dr. Heath P. Tarbert 21, JD and JSD from University of Pennsylvania Law School, Master of Studies and Doctor of Philosophy in Comparative Law from Oxford University, “Self-Regulation in the Derivatives Markets: Stability Through Collaboration”, Northwestern Journal of International Law & Business, 41 NW J. Int'l L. & Bus. 175, Winter 2021, Lexis

2. International Harmonization

Another area where government action is necessary relates to international harmonization. While SROs are often adept at formulating cross-border principles and standards with other SROs, 150 the government--and particularly a federal agency--is critical to advancing harmonized regulatory systems with foreign governmental counterparts. An example is the recent harmonization of certain swap data reporting efforts. In proposing and finalizing a new system for data reporting by swap dealers and swap data repositories, the CFTC has worked to harmonize its framework with that of the European Securities and Markets Authority (ESMA). 151 As data is inherently borderless and because swap dealers and swap data repositories often must report data to both the CFTC and ESMA, harmonizing reporting requirements where appropriate can produce significant cost savings and efficiencies for market participants.

For example, the CFTC's efforts to bring its swap data reporting system into greater harmony with international coordination efforts has led to the publication of a CFTC Technical Specification, which contains 128 reportable data fields. 152 The Technical Specification streamlines hundreds of prior fields that were previously required by swap data repositories operating without clear CFTC guidance. This change will enable the CFTC to receive the data it needs to perform its regulatory functions while at the same time reducing duplicative reporting burdens for entities subject to [\*203] multiple jurisdictions. In proposing revisions to the swap data reporting rules, the Chairman of the CFTC stated:

As it stands today, a market participant with a swap reportable to the CFTC might also have to report the same swap to the SEC, the European Securities and Markets Authority (ESMA), and perhaps other regulators as well. The global nature of our derivatives markets has led to the preparation and submission of multiple swap data reports, creating a byzantine maze of disparate data fields and reporting timetables. Market participants should not incur the costs and burdens of reporting a grab-bag of dissimilar data for the very same swap. That approach helps neither the market nor the CFTC: conflicting data reporting requirements make regulatory coordination more difficult, preventing a panoramic view of risk. 153

Resolving situations like this requires significant federal action to coordinate with and align regulatory requirements and technical standards with foreign regulators. 154 While SROs can be very effective at constructing international standards, they lack the ability to place the imprimatur of the United States government, as a sovereign nation, on negotiations and regulatory efforts. In contrast, CFTC action in the swap data reporting context has given assurances to other regulators that harmonization efforts have the backing of the United States government. This is important not only for the mechanics of promulgating rules, but also for international comity: federal support for collaborative efforts sends a strong signal to foreign governmental counterparts that can lay the groundwork for future cooperation.

Signaling aside, there is a practical reason to prefer government action in the international harmonization space. Just as states and localities do not negotiate treaties, 155 leaving regulatory harmonization efforts primarily to federal agencies is important to produce a unified and holistic message. The numerous exchanges in the derivatives space--each an SRO in its own right--have varying interests and priorities that could complicate efforts to place them in charge of harmonization efforts with overseas regulators. The ability of the CFTC to speak with one voice on behalf of the U.S. derivatives markets when negotiating and collaborating with foreign regulators is a clear benefit of federal action in the international space.

### Horse-Trading DA---2AC

#### Courts strike it down.

Nihal Krishan 9-13, Technology Reporter for the Washington Examiner, “New Texas social media anti-censorship bill likely to face legal challenges,” Yahoo News, 09-13-2021, https://news.yahoo.com/texas-social-media-anti-censorship-095200298.html

Republicans are touting a new Texas social media law as a blow against Big Tech censorship, but the measure is expected to run into trouble in the courts.

Gov. Greg Abbott signed HB 20 on Thursday, and it is slated to take effect in November. It will make Texas the latest Republican state to go after social media platforms — such as Facebook, Twitter, and YouTube — for alleged anti-conservative bias and censorship.

Florida passed a similar law last month, but a federal judge blocked it from going into effect. Other Republican-led states, such as Utah and North Dakota, are also pushing for reduced censorship.

The Texas bill would stop social media giants with more than 50 million monthly users from banning content based on user viewpoints.

It would also require social media companies to be transparent about content moderation policies, publish reports about content they remove, and create appeals processes for users who disagree with content moderation decisions.

"We will always defend the freedom of speech in Texas, which is why I am proud to sign House Bill 20 into law to protect first amendment rights in the Lone Star State," Abbott said in a statement Thursday.

"Social media websites have become our modern-day public square. They are a place for healthy public debate where information should be able to flow freely — but there is a dangerous movement by social media companies to silence conservative viewpoints and ideas. That is wrong, and we will not allow it in Texas," he added.

Conservatives have worried about their online speech being stifled after former President Donald Trump was banned from most major platforms for his role in the Jan. 6 Capitol riots.

Abbott openly tying the law to concerns of conservative censorship will make it easier to defeat in court on First Amendment grounds, lawyers say.

"The First Amendment protects speech from being compelled, and the government shouldn’t be in position of picking winners and losers when it comes to speech. It's not a conservative approach," said Carl Szabo, a conservative lawyer and vice president at NetChoice, a tech trade group that supported the lawsuit blocking the Florida law.

Szabo said NetChoice is also expecting to back a forthcoming lawsuit against the Texas law.

Conservative lawyers say the Texas legislation, and others like it, could backfire and result in less conservative speech and several onerous lawsuits.

"The likelihood of the law actually being enacted is next to zero because the tech platforms are highly likely to win in court thanks to the terms of condition that users agree to when signing up and first amendment protections," Szabo said.

If the law does go into effect, it will hurt small and midsize social media platforms, such as GETTR and Parler, rather than tech giants, such as Facebook and Twitter, because they will not be able to afford to defend themselves in court as bigger platforms can, according to Szabo.

"Competitors to the large social media giants are most harmed by this law along with people of Texas, that will have to tolerate horrible content if the Texas law is actually enforced," Szabo said.

As more Republican state legislatures push for laws aimed at censorship, pressure is increasing to create federal legislation to address the issue of social media content moderation by updating laws in Congress rather than a patchwork of inconsistent state laws.

However, the Texas law is not likely to be replicated in Congress any time soon.

"I don't think Republicans will view the Texas law as a national model to follow at all," Szabo said, highlighting the law will meet the same fate as the Florida law that has become tied up in the courts.

"Republican lawmakers need to ask themselves if they want to follow in the failed footsteps of Texas and Florida or recognize the government simply can’t violate the First Amendment by controlling and compelling speech," he added.

### AT: Truth Decay Impact

#### ‘Truth decay’ is nonsense

Dr. Steven Pinker 19, Johnstone Professor of Psychology at Harvard University, “Why We Are Not Living in a Post‑Truth Era”, https://www.skeptic.com/reading\_room/steven-pinker-on-why-we-are-not-living-in-a-post-truth-era/

Anyone who urges universities to live up to their mission of promoting knowledge, truth, and reason is bound to be confronted with the objection that these aspirations are just so 20th century. Aren’t we living in a post-truth era? Haven’t cognitive psychologists shown that humans are fundamentally irrational? Mustn’t we acknowledge that the pursuit of disinterested reason and objective truth are Enlightenment anachronisms?

The answer to all of these questions is “no.”

First, we are not living in a post-truth era. Why not? Consider the statement “We are living in a post-truth era.” Is it true? If so, it cannot be true.

Likewise, it is not the case that humans are irrational. Consider the statement, “Humans are irrational.” Is that statement rational? If it is, it cannot be true—at least, if it is uttered and understood by humans. (It would be another thing if it was an observation exchanged among an advanced race of space aliens.) If humans were truly irrational, who specified the benchmark of rationality against which humans don’t measure up? How did they conduct the comparison? Why should we believe them? Indeed, how could we understand them?

In his book The Last Word, the philosopher Thomas Nagel showed that truth, objectivity, and reason are not negotiable.2 As soon as you start making a case against them, you are making a case, which means you are implicitly committed to reason. Nagel calls this argument Cartesian, after Descartes’ famous argument that just as the very fact that one is pondering one’s existence shows that one must exist, the very fact that one is examining the validity of reason shows that one is committed to reason. A corollary is that we don’t defend or justify or believe in reason, and we certainly do not, as it is sometimes claimed, have faith in reason. As Nagel puts it, each of these is “one thought too many.” We don’t believe in reason; we use reason.

This may sound like logic-chopping, but it’s built into the way we make everyday arguments. As long as you’re not bribing or threatening your listeners to mouth agreement with you, but trying to persuade them that you’re right—that they should believe you, that you’re not lying, or full of crap— then you have conceded the primacy of reason. As soon as you try to argue that we should believe things by any route other than reason, you’ve lost the argument, because you’ve appealed to reason. That is why a defense of reason is unnecessary, perhaps even impossible.

As for the “post-truth era,” journalists should retire this cliché unless they can keep up a tone of scathing irony. It comes from the observation that some politicians—one in particular—lies a lot. But politicians have always lied. They say that in war, truth is the first casualty, and that can be true of political war as well. (The expression “credibility gap” had its heyday during the administration of Lyndon Johnson in the 1960s.) And the bending or inverting of truth by people in power has long been consequential, leading, for example, to the Spanish-American war, the First World War, the Vietnam War, and the Iraq War, right up to the near miss in the Persian Gulf in 2019.

Another inspiration for the post-truth cliché is the recent prominence of “fake news.” But this, too, is not a new development. The title of the James Cortada and William Aspray’s forthcoming Fake News Nation: The Long History of Lies and Misinterpretations in America, is self-explanatory, though the long history is by no means confined to America.3 The Protocols of the Elders of Zion, the hoaxed proceedings of a secret meeting of Jews plotting global domination, was advanced as fact by a number of prominent people in subsequent decades, including the industrialist Henry Ford. Countless pogroms, lynchings, and deadly ethnic riots have been sparked by rumors of the alleged perfidy of some minority group.

And the belief that fake news is displacing the truth itself needs to be examined for its truth. In their analysis of fake news in the 2016 American presidential election, Andrew Guess, Brendan Nyhan, and Jason Reifler found that it took up a minuscule proportion of the online communications (far less than 1 percent) and was mainly directed at partisans

<<Marked>>

who were impervious to persuasion.4 This is hardly surprising: unless you were already marinated in a rightwing fever swamp, if you came across a social media post claiming that Hillary Clinton was running a child sex ring out of a Washington DC pizzeria, you would treat it as exactly what it is.

# 1AR---Octas---NU

## Innovation ADV

### AT: Transition

#### Retrenchment causes nationalism, war, and protectionism – optimists falsely assume current cooperative trends will continue without the US security guarantee

Matthew Fay 17, Director of Defense and Foreign Policy Studies @ The Niskanen Center, 11/16/17, “America Unrestrained?: Engagement, Retrenchment, and Libertarian Foreign Policy,” https://niskanencenter.org/wp-content/uploads/2017/11/America-Unrestrained.pdf

A number of the arguments libertarians make in favor of retrenchment have merit, but the cost-benefit analysis derived from them is based on a deterministic view of international politics. Libertarian retrenchers assume that international politics would remain more or less the same absent American engagement and that America’s domestic politics would remain the same even if the international system become more conflict-prone. Given the inherent uncertainty of forecasting, the costs and benefits of engagement and retrenchment need to be considered in a more probabilistic fashion.86 This section begins by exploring a number of scenarios that could occur should the United States adopt a grand strategy of retrenchment. It then reassesses the costs and benefits of retrenchment for a free society. In a system with more independent states balancing against one another, is war more or less likely? Libertarians are placing a bet that all else would remain equal in international politics if the United States retrenches. While they assume a world where an increased number of states are balancing against one another would remain peaceful, the reality is not entirely clear. Using basic realist premises about state behavior under international anarchy, it is easy to identify a number of scenarios less rosy than the one libertarians assume would occur should the United States retrench. These scenarios might include a world of increased nationalism, eroding norms against military aggression, increased economic autarky, and the further spread of nuclear weapons as states look to produce security for themselves. Some states may also fail to balance against threats in the wake of American retrenchment, increasing the likelihood the United States will be drawn into a major war. Libertarians assume that in the absence of an alliance with the United States, other countries would simply increase their defense spending if they felt threatened. However, internal balancing is not a mechanical process. According to John Mearsheimer, leaders of states facing security competition are likely to use nationalism to garner support from their populations for the necessary regeneration of military capabilities.87 Writing at the end of the Cold War, Mearsheimer suggested that Europe would revert to a pattern of recurrent warfare. The absence of the United States and the Soviet Union would leave Europe, once again, an anarchic multipolar system. The structure of the system would force the states to compete with one another, as they had prior to the Cold War. Mearsheimer argued that pre-1945 “hypernationalism” was a product of “security competition among the European states, which compelled elites to mobilize public support for national defense efforts.”88 American retrenchment could similarly lead to an anarchic, multipolar Europe—thus increasing the chances of war on the continent. Such a system could engender nationalist sentiments among the populations of Europe, heightening animosities between national groups. These heightened animosities could help erode norms against military aggression that have facilitated the decline in interstate war. Nationalist groups within a country can seize on these sentiments to pursue confrontational and expansionist policies.89 Encouraging support for increased military capabilities through nationalism might lead populations to see war as once again a means to national glory or maintaining national honor. Matters of national prestige and honor can lead to the initiation of wars when bound up in territorial claims, while at the same time increasing the intensity and duration of a conflict.90 Nationalism and security competition might also erode the pacifying effects of economic openness. Realism suggests states are concerned about relative gains.91 States in security competition might be wary of trading with one another due to concerns about how a potential rival’s economic gains might provide it with an advantage if translated into military power. They may also adopt autarkic policies for fear of undermining their economic and military self-sufficiency.92 Territorial conquest has become increasing anachronistic in international politics. However, the proliferation of protectionist policies might once again make aggression and preventive war seem like strategically sensible ways for states to secure the resources necessary to reduce the ability of potential rivals to cut them off economically. If the risk of territorial aggression increases, the possession of nuclear weapons would become an attractive option for some states whose security was previously guaranteed by the United States. Nuclear weapons are most useful for deterring major territorial aggression, meaning their potential utility increases as the potential for war does.93 A number of U.S. allies have either previously pursued nuclear weapons or have the capability to do so. They might choose to obtain a nuclear arsenal once responsible for their own security.

## Cap K

### Sustainability---1AR

#### Financialization is sustainable.

Martijn Konings 18. Associate Professor of Political Economy at the University of Sydney, author of The Emotional Logic of Capitalism and Capital and Time: For a New Critique of Neoliberal Reason, series editor for the Stanford University Press book series, Currencies. 02-07-18. “A Critique of the Critique of Finance.” Stanford University Press Blog. https://stanfordpress.typepad.com/blog/2018/02/a-critique-of-the-critique-of-finance.html.

Critics of neoliberal capitalism rarely recognize the productive power of speculation. If there is one theme that unites the various critiques of contemporary finance, it is the emphasis on its speculative character. Financial growth is said to be driven not by the logic of efficient markets, but rather by irrational sentiment, “animal spirits” that do not respect fundamental values. Emphasizing the role of volatility in contemporary capitalism (evident at the time of writing, as the stock market is experiencing a downturn) is important as an antidote to notions of market efficiency and equilibrium. But it is a mistake to think that it provides a sufficient basis for effective critique. Predictions regarding the limits or collapse of neoliberal finance have simply not enjoyed a good track record. Over and over, the contemporary financial system has proven capable of sustaining higher levels of speculative activity than anticipated. This has certainly been true of the past decade. Capital and Time: For a New Critique of Neoliberal Reason is my attempt to make sense of this—that is, to understand what might be wrong or missing in the existing heterodox critique of speculation, and to advance a more accurate understanding of the role of uncertainty, risk, and speculation in contemporary capitalism. At the heart of the critique of speculation we find a distinction between real and fictitious forms of value. Although “essentialist” (or “foundationalist”) modes of explanation have been under fire across the social sciences for several decades now, when it comes to the critique of finance they have had considerable staying-power: without a notion of real value, it often seems, we lose any objective standard against which to assess the speculative gyrations of capitalist markets. Capital and Time asks what kind of critical theory we might develop if we bracket the anxious attachment to a notion of fundamental value. To that end, it turns to the work of economist Hyman Minsky. Although Minsky has been popularized precisely as a critic of speculation, he in fact insisted that almost all value judgments and investments were to some degree speculative—their success or failure would be determined in an unknown future. For him, the key economic question is how order emerges in a world that offers no guarantees, how more or less stable standards and norms arise amidst uncertainty. Of course, the “endogenous” origin of financial standards is a well-rehearsed theme in heterodox economics—indeed, it is a staple of the “post-Keynesian” literature that claims Minsky’s legacy. But such perspectives have never been able to break with the idea that financial stability is at its core dependent on external interventions that suppress speculative impulses. For Minsky, however, this is to miss the point about endogeneity. To his mind, there was no clear dividing line between financial practices and their governance: central banks and other public authorities are no more able to see into the future and to transcend uncertainty than private investors are. Minsky was therefore highly skeptical about official claims of discretionary precision management: financial governance is always embroiled in the very risk logic that it is charged with managing. That also means that financial policy can appear quite ordinary, even banal: at the heart of capitalist financial management is a logic of backstopping and bailout that responds to the possibility that the failure of an institution may take down wider financial structures. The stability of the post-New Deal financial system is often attributed to the Glass-Steagall separation of the stock market and commercial banking. But Minsky tended to view Glass-Steagall as one of several measures to direct bank credit away from the stock market towards other, no less speculative ends, notably consumer and mortgage financing. To his mind, the stability of the post-war period derived rather from the creation of an extensive financial safety net (which included, for instance, deposit insurance, which removed the rationale behind bank runs) that served to socialize risk. This institutional arrangement turned out to have a significant drawback: a pattern of chronic inflation emerged that, by the late 1970s, was widely perceived as a major problem. Minsky’s lack of faith in the possibility of cleanly staged external interventions led him to feel that that there was no real way out of this predicament. Monetarist doctrines, ascendant during the 1970s under the influence of Milton Friedman, relied on exactly the belief in an arbitrarily defined monetary standard that Minsky rejected as naïve. Muddling through, it seemed, was the price of avoiding another financial crash and depression. The Volcker shock of 1979 changed this dynamic in a way that Minsky had not foreseen but that is comprehensible when seen through the lens he provided us with. Paul Volcker looked to monetarism not as a means to enforce an external limit or standard on the financial system, but as a politically expedient way to break with accommodating policies and to proactively engage the endogenous dynamics of finance. The consequences of the Volcker shock were predictable (which is exactly why the Federal Reserve had been reluctant to pursue similar policies in previous years): inflation gave way to instability and crisis. Inflation was conquered as jobs were lost and wages stagnated. And, far from money being returned to its neutral exchange function, opportunities for speculation multiplied. The American state was never going to sit idly by as the financial system returned to dynamics of boom and bust: when instability took the form of systemic threats, authorities would bail out the institutions that had overextended themselves. Of course, Volcker would not have been able to predict the specific features of the too-big-to-fail regime as it emerged during the 1980s and evolved subsequently; but the very point of the neoliberal turn in financial management that he had overseen was to create a context where risk could be socialized in ways that were more selective and therefore did not entail generalized inflation. The inflation of asset values that has been such a marked feature of the past four decades has always been premised centrally on the willingness of authorities to view the “moral hazard” of the too-big-to-fail logic as a policy instrument—even if they may have decried it officially as a regrettable corruption of market principles. Spectacular bailouts, mundane policies to protect the key nodes of the payment systems, the “Greenspan put”, the different iterations of quantitative easing—these are all variations on that basic too-important-to-fail logic. Existing critical perspectives tend to view crisis and the need for bank bailouts as manifesting the essential incoherence of neoliberal finance, its lack of solid foundations and the irrationality of speculation. Capital and Time breaks with such moralistic assessments. The way deepening inequality and the speculative growth of asset values continue to feed off each other is troubling for any number of reasons, but there is nothing inherently “unsustainable” about it—the process does not have a natural or objective limit. At this point in time, the critique of speculation does little more than lend credibility to official discourses that present crises as preventable and bailouts as one-off, never-to-be-repeated interventions. In that way, it prevents us from critically relating to a neoliberal reality that has been shaped to its core by the speculative exploitation of risk and uncertainty, and in which regressive risk socialization serves as the everyday logic of financial governance.

#### No peaks and yes decoupling---disaggregated analysis proves.

Linus Blomqvist 18. Director of the Conservation and Food & Agriculture programs at the Breakthrough Institute, visiting researcher at the University of Tasmania where he is part of a team studying drivers of agricultural expansion and forecasting future land-use change, MESc from Yale’s School of Forestry and Environmental Studies, where he specialized in environmental economics, and a BA in Geography from Cambridge University. 04-04-18. “Decoupling or Degrowth? Why "Peak Stuff" May Not Be As Dire As You’ve Heard.” Breakthrough Institute. <https://thebreakthrough.org/issues/conservation/is-decoupling-doomed>.

Does humanity’s growing use of materials mean that decoupling is impossible? In a word, no, and attempts to reduce all resource and environmental problems to our material footprint won’t help us solve problems of resource scarcity or environmental impacts. In a recent article for Fast Company, the University of London’s Jason Hickel claims that humanity can only consume 50 billion tons of “stuff” each year (compared to current consumption levels at about 80 billion tons). And according to several papers that Hickel cites, that can’t be achieved in the foreseeable future, given growing populations and economies. The only solution, according to Hickel, is to ditch our addiction to GDP growth. Hickel is challenging the concept of “green growth,” which he describes as “absolute decoupling of GDP from material use.” But before talking about evidence for or against decoupling, it's important to ask: decoupling of what? Broadly, there are two reasons to worry about consumption: running out of materials (like fossil fuels) and environmental impacts (like pollution or habitat loss). These often get conflated in unhelpful ways. What Hickel refers to when he talks about decoupling is material flows, which are dominated by things like fossil fuels, metal ores, construction minerals, biomass, and the like. Lumping different material flows together can be misleading, in that it groups together resources that are being used sustainably with those that aren’t, and/or resources that cause big environmental impacts with those that cause smaller environmental impacts. So let’s look at the materials at play here. For several of the materials with the biggest footprint in terms of volume (construction minerals, metal ores, etc.), the problem isn’t really that we're at risk of running out of stuff. Construction minerals account for a large portion of global material flows, but those are resources like stone — last time I checked, we weren't approaching peak stone. (Cue joke about the end of the Stone Age.) We could have a perfectly sustainable civilization without absolutely decoupling from stone for a long time. The 50 billion tons limit is completely arbitrary — it was based on material consumption in the year 2000 — and shouldn’t be taken as the dividing line between sustainability and environmental doom. What about environmental impacts? Here, too, aggregate resource consumption can give a misleading picture. Some of the big items in material flows (again, like construction minerals) account for a pretty small portion of environmental impacts like greenhouse emissions or land use. For biomass, we've managed to increase production and thus mass flows a lot using the same amount of land, so the impacts haven't gone up in proportion to the mass flows. When we look at the actual impacts — like greenhouse emissions, habitat loss, pollution of air and water, and so on — we're seeing some positive trends, and in fact some instances of absolute decoupling. Emissions of several pollutants (like sulfur dioxide) have peaked and declined globally, although they are still going up in some developing nations; nitrogen oxides and nitrous oxide emissions are flat globally. Total farmland area (the most important driver of biodiversity and habitat loss and an important driver of carbon emissions) has peaked, although it's plausible that it will go up again. Water extraction peaked several decades ago in the United States, in spite of increasing industrial and agricultural output. Greenhouse emissions have not peaked globally, and may continue to go up for a while, making carbon emissions perhaps the least decoupled and most concerning of all trends. Even relative decoupling has come to a halt as coal-heavy China accounts for an increasing share of global emissions. As Breakthrough has written about for a long time now, we are still a long way from scalable food and energy systems that run without fossil fuels. But here, too, the most pragmatic solutions involve accelerating technological substitution of clean energy for dirty energy — the same general process of decoupling that has driven progress in other resources. Some or most of these trends may be moving too slowly for Hickel and other observers, and indeed, where acceleration is possible, that should be both the technological and policy goal. But aggregate human consumption of resources doesn’t tell us much of interest about either resource sustainability or environmental impacts. To get at those problems, we need to look at things resource by resource, pollutant by pollutant. And when we do that, we see some significant progress, along with some still-worrying trends. Above all, though, we know that as societies develop, food and energy production gets more resource-efficient, economic growth slows down, and fertility rates decline. All of these trends still imply large environmental impacts in the future. But while intentional economic degrowth or hard limits on resource use seem far-fetched, absolute decoupling of the things that matter — environmental impacts — is still a very real possibility.

### NETs---1AR

#### Warming is irreversible---even if humans stop emissions.

Mark Kaufman 21, Mark is a science reporter at Mashable, “What Earth was like last time CO2 levels were this high,” Mashable, 4-20-2021, https://mashable.com/article/carbon-dioxide-earth-co2/ //EM

It’s a time called the Pliocene or mid-Pliocene, some 3 million years ago, when sea levels were around 30 feet higher (but possibly much more) and giant camels dwelled in a forested high Arctic. The Pliocene was a significantly warmer world, likely at some 5 degrees Fahrenheit (around 3 degrees Celsius) warmer than pre-Industrial temperatures of the late 1800s. Much of the Arctic, which today is largely clad in ice, had melted. Heat-trapping carbon dioxide levels, a major temperature lever, hovered around 400 parts per million, or ppm. Today, these levels are similar but relentlessly rising, at some 418 ppm.

Humanity is currently on track to warm Earth to Pliocene-like temperatures by century’s end — unless nations ambitiously slash carbon emissions in the coming decades. Sea levels, of course, won’t instantly rise by tens of feet: Miles-thick ice sheets take many centuries to thousands of years to melt. But, critically, humanity is already setting the stage for a relatively quick return to Pliocene climes, or climes at least significantly warmer than now. It’s happening fast. When CO2 naturally increases in the atmosphere, pockets of ancient air preserved in ice show this CO2 rise happens gradually, over thousands of years. But today, carbon dioxide levels are skyrocketing as humans burn long-buried fossil fuels.

"CO2 in the atmosphere has gone up 100 ppm in my lifetime," said Kathleen Benison, a geologist at West Virginia University who researches past climates. “That’s incredibly fast geologically."

"You don’t have to be a scientist to realize something totally weird is going on, and that weird thing is humans," noted Dan Lunt, a climate scientist at the University of Bristol who has researched the Pliocene.

A NASA graphic, from 2013, showing Earth's atmospheric CO2 levels had already reached levels similar to the Pliocene.

The problematic Pliocene

Sure, it takes a long time for sea levels to catch up with Earth’s warming. But in a plethora of other ways, the planet is already reacting to about 2 F (1.1 C) of warming since the late 1800s: Wildfires are surging in the U.S., major Antarctic ice sheets have destabilized, heat waves are smashing records, storms are intensifying, and beyond.

More warming will further exacerbate these consequences of increased heat. It will get worse. But will it get Pliocene bad? That’s up to the most fickle, unpredictable factor of the climate equation: humans.

"CO2 levels are going to increase," said Lunt. "We could hit the Pliocene in terms of temperature. But it depends on how rapidly we emit [greenhouse gases]."

Some of the human-driven changes happening on Earth today won’t be reversed for centuries or thousands of years. In large part, that’s because civilization continues to deposit prodigious loads of carbon into the atmosphere each year, and all these heat-trapping gases won’t magically vanish from the air, even if we instantly stop adding carbon to the atmosphere. Rather, they’ll have impacts upon the planet — like gradually rising seas and acidifying oceans — for at least centuries. Already, sea levels have risen by some eight to nine inches since the late 1800s, and a conservative estimate, from the UN's Intergovernmental Panel on Climate Change, is sea levels will rise by another one to two feet by the century's end. But, this could very well be more like two or three feet, or even more depending on what Antarctica’s colossal, melting Thwaites Glacier (it’s the size of Britain) purges into the sea this century.

"Sea level rise and ocean acidification are permanent on a human time scale," said Julie Brigham-Grette, a geologist at the University of Massachusetts Amherst who researches how the Arctic has changed since the Pliocene.

### NETs---AT: Leakage

#### Empirically, there’s no impact---AND new studies disprove consensus.

Stephen Groves 21. Reporter at the Associated Press. “Carbon-capture pipelines offer climate aid; activists wary.” AP NEWS. 7-24-2021. https://apnews.com/article/technology-joe-biden-business-climate-climate-change-dc976d17ccd6581f25d823b6a894f87f //EM

Supporters say the pipelines are a much-needed win for both agricultural businesses and the environment. The two projects are expected to run into the billions of dollars, spurring construction jobs. And they advance a technology crucial to achieving a 2050 goal of net-zero carbon dioxide emissions — in which every gram of emissions is accounted for by providing a way to eventually suck it back out of the atmosphere.

“All sides win. You significantly reduce carbon emissions, but you can also maintain those industries that are the lifeblood of different regions of the country,” said Brad Crabtree, who oversees carbon management policy at the Great Plains Institute, a Minnesota-based organization that works with energy companies to develop environmental sustainability.

Crabtree, who also directs a group called Carbon Capture Coalition, sees it as a way to bridge partisan divides as the country addresses climate change. As evidence, he points to one high-profile Republican backer — North Dakota Gov. Doug Burgum — who is pushing a plan to make the state carbon-neutral by 2030, “through innovation not regulation.”

The federal government set off the scurry of pipeline plans by increasing, by 2026, tax credits to $50 for every metric ton of carbon dioxide a company sequesters. California’s Low Carbon Fuel Standard has sweetened the deal by requiring that distributors in that state buy only ethanol with a low carbon emissions impact; companies that produce such ethanol can get a higher price.

While the practice of storing carbon dioxide in rock formations has been around for almost 50 years, developing technology that captures carbon emissions has proven to be expensive and struggled to gain widespread use.

Ethanol refineries could represent the low-hanging fruit that helps push the technology forward into widespread use. Plants such as corn are natural sponges of carbon dioxide, absorbing the gas and storing carbon as they grow through the spring and summer. When those crops ferment into ethanol, which is eventually mixed with gasoline, it produces a steady, easily-captured stream of carbon dioxide.

“These early plants are relatively easy and that’s a good place to start,” said Greg Nemet, a professor at the University of Wisconsin-Madison who specializes in the development of climate-friendly energy technology. “As that gets shown and proven, you get some transportation networks, then it gets easier to do the harder stuff later.”

Achieving that harder stuff — sucking carbon dioxide already in the atmosphere or catching emissions at power plants — will almost certainly be crucial to beating back global temperature increases. The Intergovernmental Panel on Climate Change reached that conclusion in 2018 as it laid out a path to halting temperature increases to 1.5 C (2.7 F).

Despite concerns from Raffensperger and others about potential leaks from the pipelines or storage sites, the Environmental Protection Agency has concluded that storing carbon dioxide is safe as long as companies do it carefully. It is injected in a liquefied state into porous rock formations, where it eventually dissolves or hardens into minerals.

Crabtree said there has not been a single human fatality or serious injury in the United States from transporting or storing captured carbon dioxide. He thinks that as long as companies act responsibly, landowners will be convinced the pipelines are safe and can benefit from them.