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# 1AC – Dartmouth CS

## 1AC – Kentucky v2

### 1AC – Dynamism

#### Contention one: Dynamism

#### Dominant digital platforms gatekeep access to markets by both operating a platform and marketing their own goods on it – only structural prohibitions prevent barriers to entries posed by companies’ structure, not just the scale of their market power.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098; AS]

A handful of digital platforms exert increasing control over key arteries of American commerce and communications. Structuring access to markets, these firms function as gatekeepers for billions of dollars in economic activity. By virtue of setting marketplace rules for the millions of merchants, producers, and developers dependent on their infrastructure, dominant platforms today “function as regulators.”3

As these platforms further concentrate market power, there are rising concerns about their size—usually in reference to the large share that each firm captures of its primary markets.4 Yet an equally important question concerns not the scale of these companies but their structure. One feature dominant digital platforms share is that they have integrated cross business lines such that they both operate a platform and market their own goods and services on it. This structure places dominant platforms in direct competition with some of the businesses that depend on them, creating a conflict of interest that platforms can exploit to further entrench their dominance, thwart competition, and stifle innovation.5 Consider Spotify’s effort to reach users through Apple’s iPhone while Apple sought to promote Apple Music. In 2016, Spotify revealed that Apple had blocked the streaming application from the App Store, “continu[ing] a troubling pattern of behavior by Apple to exclude and diminish the competitiveness of Spotify on iOS and as a rival to Apple Music.”6 Or take the challenge faced by Yelp, Foundem, and scores of online services to reach internet users while Google sought to build out its own competitor offerings.7

In Europe and India, competition authorities have found that Google ranks its own services higher than those offered by rivals, a “search bias” that means anyone competing with Google properties may effectively disappear from Google search results.8 Merchants that rely on Amazon to reach consumers are in a similar bind: Not only must they jostle for placement against Amazon’s own goods, but they also face the constant risk that Amazon will spot their bestselling items and produce them itself.9 Facebook, equipped with technology that lets it detect which rival apps are succeeding, would often give companies a choice: Be acquired by Facebook, or watch it roll out a direct replica.10 Competing with one of these giants on the giant’s own turf is rife with hazards.

Venture capitalists now factor this risk into their investment decisions.11 Indeed, the power of these gatekeeper platforms to steer the fate of countless other firms is described by entrepreneurs and investors as “having a profound impact on innovation in Silicon Valley”12 and “choking off the start-up world.”13 Venture capitalists now discuss a “kill-zone” around digital giants—“areas not worth operating or investing in, since defeat is guaranteed.”14 Discussing how tech platform giants today use their integrated structure to undermine rivals, a product manager who worked for Microsoft leading up to its antitrust suit observed, “It’s what we did at Microsoft.”15

Indeed, the way in which dominant online platforms threaten to undermine competition and distort markets today is not entirely new. At its core, the problem traces to a basic challenge posed by firms that capture control over a critical network or channel of distribution. Regulators and competition authorities have traditionally harnessed a set of tools to ensure that bottleneck facilities do not distort competition. These tools include common carriage, which requires firms to offer customers equal access on equal terms,16 as well as interoperability, which requires networks to maintain an open interface, enabling users to switch between platforms with ease.17 These policies respond, respectively, to problems of discrimination and lock-in.

In digital markets, however, third parties that depend on a platform risk not just discrimination and lock-in but also appropriation. Because dominant platforms monitor with unrivaled precision the business activity of third parties while also competing with them, a platform can harvest insights gleaned from a producer at the producer’s expense. This Article argues that these combined problems of discrimination and information appropriation invite recovering common carriage’s forgotten cousin: structural separations. Structural separations place clear limits on the lines of business in which a firm can engage. Rather than prohibit particular business practices, separations proscribe certain organizational structures. In antitrust, structural remedies are contrasted with behavioral ones: Whereas behavioral remedies seek to prevent firms from engaging in specific types of conduct, structural remedies seek to eliminate the incentives that would make that conduct possible or likely in the first place.18

Structural prohibitions have been a traditional element of American economic regulation. They have been applied as a standard regulatory tool and key antitrust remedy in network industries, often to prohibit a dominant intermediary from competing with the businesses that depend on it to get to market. While common carriage regimes prevent a firm from discriminating—requiring equal service on equal terms—structural prohibitions eliminate one source of the incentive to discriminate. In this way, common carriage and structural separations often functioned as complements in the service of nondiscrimination.

Today, structural separations have largely been abandoned.19 At the same time that lawmakers have significantly weakened or outright eliminated sector-specific regulatory regimes, judicial interpretation of antitrust law has drastically narrowed the forms of vertical conduct and structures that register as anticompetitive. And when antitrust enforcers have targeted these forms of conduct and structures in recent years, they’ve applied remedies that generally (1) fail to target the underlying source of the problem and (2) overwhelm the institutional capacities of the government actors assigned to oversee them.20 Neglecting structural separations results in both substantive harms and institutional misalignments—effects that are especially pronounced in digital markets.

#### Case-by-case adjudication creates slow and ambiguous enforcement of prohibitions on unfair business practices – regulatory uncertainty substantially disadvantages entrants.

Chopra & Khan ’20 [Rohit; Commissioner @ Federal Trade Commission; and Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Case for “Unfair Methods of Competition” Rulemaking,” *The University of Chicago Law Review* *87*(2), p. 357-380; AS]

Antitrust law today is developed exclusively through adjudication. In theory, this case-by-case approach facilitates nuanced and fact-specific analysis of liability and well-tailored remedies. But in practice, the reliance on case-by-case adjudication yields a system of enforcement that generates ambiguity, unduly drains resources from enforcers, and deprives individuals and firms of any real opportunity to democratically participate in the process. One reason that antitrust adjudication suffers from these shortcomings is that courts analyze most forms of conduct under the “rule of reason” standard. The “rule of reason” involves a broad and open-ended inquiry into the overall competitive effects of particular conduct and asks judges to weigh the circumstances to decide whether the practice at issue violates the antitrust laws. Balancing short-term losses against future predicted gains calls for “speculative, possibly labyrinthine, and unnecessary” analysis and appears to exceed the abilities of even the most capable institutional actors.1 Generalist judges struggle to identify anticompetitive behavior2 and to apply complex economic criteria in consistent ways.3 Indeed, judges themselves have criticized antitrust standards for being highly difficult to administer.4 And if a standard isn’t administrable, it won’t yield predictable results. The dearth of clear standards and rules in antitrust means that market actors face uncertainty and cannot internalize legal norms into their business decisions.5 Moreover, ambiguity deprives market participants and the public of notice about what the law is, thereby undermining due process—a fundamental principle in our legal system.6

Decades ago, former Commissioner Philip Elman observed that case-by-case adjudication “may simply be too slow and cumbersome to produce specific and clear standards adequate to the needs of business~~men~~[people], the private bar, and the government agencies.”7 Relying solely on case-by-case adjudication means that businesses and the public must attempt to extract legal rules from a patchwork of individual court opinions. Because antitrust plaintiffs bring cases in dozens of different courts with hundreds of different generalist judges and juries, simply understanding what the law is can involve piecing together disparate rulings founded on unique sets of facts. All too often, the resulting picture is unclear. This ambiguity is compounded when the Supreme Court assigns to lower courts the task of fleshing out how to structure and apply a standard, potentially delaying clarity and certainty for years or even decades.8

#### Even uncertainty dissuades start-up entry and investment – dynamism is at 30-year lows.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098; AS]

1. Are Dominant Digital Platforms Stifling Innovation? — One risk associated with foreclosure and value appropriation by dominant digital platforms is that this conduct could deter entry and chill innovation. If independent developers or producers rely on a dominant platform to reach customers and also face the constant risk that the platform will foreclose access, appropriate their business value, or both, producers may be less likely to secure funding and develop their product in the first place. In Microsoft, the district court found that Microsoft’s exclusionary conduct not only had hobbled innovation in middleware and applications software but had discouraged competition throughout the computer industry as a whole.185 The long-term effect of its conduct was to “deter[] investment in technologies and businesses that exhibit[ed] the potential to threaten Microsoft.”186

Anecdotal evidence suggests that both actual entry and the threat of entry by digital platforms into platform-adjacent markets is dampening investment in complementary segments, now known as a “kill-zone.”187 For example, a survey of more than two dozen Silicon Valley investors revealed that Facebook’s willingness to appropriate information from and mimic the functionality of apps has created “a strong disincentive for investors” to fund services that Facebook might copy.188 One founder observed, “People are not getting funded because Amazon might one day compete with them.”189 “We don’t touch anything that comes too close to Facebook, Google or Amazon,” said a managing partner at New Enterprise Associates.190 Another venture capital investor noted that the impact of dominant digital platforms on “what can be funded, and what can succeed, is massive.”191 This concern raised by venture capitalists makes sense: A potential innovator (or a potential funder of a potential innovator) decides whether to invest based on the anticipated risk and reward of realizing the innovation. Anticipating platform discrimination or appropriation will lower expected rewards, depressing the incentive to invest. Even the uncertainty of discrimination can dissuade entry by heightening risk.

Data on investment trends do not offer a decisive answer but generally seem consistent with the story told by surveyed investors. Venture capital funding as a whole appears to be booming: In 2018, the total annual venture capital invested surpassed $100 billion for the first time since the dot-com period.192 The number of angel and seed investments, meanwhile, has been declining since 2015, signaling that it has become harder for startups to secure an initial round of financing.193 Indeed, it is late-stage deals with mature companies that account for an “outsized proportion” of total capital today,194 while startups see fewer first financings, even as the deal value for startups has increased.195 In other words, venture capital markets seem to be following a winner-takemost model: Fewer firms receive funding, but those that do are raising more capital.196 These trends come against a backdrop of falling entrepreneurship: Startup formation is at a thirty-year low, contributing to a loss of business dynamism.197

#### There are no neatly bounded ways to capture all dimensions platform power – expanding rulemaking authority for an expert agency allows separations regimes to match market realities.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098; AS]

D. Application: Challenges and Unresolved Questions

Implementing a separations regime presents some first-order questions and challenges. First, how do we define platforms and to which platforms should a separation apply? Second, how does one identify the parameters of the platform, especially when integration provides heightened functionality? Third, what should be the scope of the prohibited activity and how should the prohibition be structured? And fourth, what is the proper institutional mechanism for implementing the separation? This section offers some initial suggestions for how to approach these questions. Arriving at a complete analytical framework for structuring separations in digital markets will require deeper engagement with these issues.

1. Defining Platform. — Offering a clearly bounded definition of “platform” is challenging. Most definitions look to the role that the entity plays in intermediating activity by others. One definition, for example, is “a firm that controls a network, facility, or essential input that those providing a complementary good or service” must “rely on.”635 Another set of definitions focuses on the infrastructure-like role that these firms play, by structuring access to markets or facilitating transactions.636 And some discussions use the terms “network,” “infrastructure,” and “platform” interchangeably.637

Recent studies by policymakers have also settled on the idea that dominant platforms play a unique role that regulators should recognize. In March, the Digital Competition Expert Panel—a panel convened by the U.K. government to study digital markets—issued a report proposing, among other ideas, that dominant platforms that enjoy a “powerful negotiating position” be designated as having a “strategic market status” and be required to abide by a special code of conduct.638 A report commissioned by the European Commission, meanwhile, noted that, by designing marketplace rules that govern millions of users, dominant platforms “function as regulators” that should face a special responsibility to “ensure a level playing field” on their marketplace and “not use [their] rule-setting power to determine the outcome of competition.”639 Given the challenge of offering a bounded definition of “dominant platform,” any definition will likely be under- or over-inclusive. But any definition should seek to capture the degree of market power that the platform enjoys over users.640 How essential is the platform’s infrastructure? To what degree do other businesses depend on the platform to reach users, and what is the cost to businesses of avoiding this platform and using alternative channels? Relevant factors could include: (1) the extent to which the entity serves as a central exchange or marketplace for the transaction of goods and services, including the level of market power that it enjoys in its platform market; (2) the extent to which the entity is essential for downstream productive uses, and whether downstream users have access to viable substitutes for the entity’s services; (3) the extent to which the entity derives value from network effects, and the type of network effects at play; (4) the extent to which the entity serves as infrastructure for customizable applications by independent parties; and (5) the size, scope, scale, and interconnection of the company.

There are no neatly bounded ways to capture these dimensions of platform power. When implementing “maximum separation,” the FCC initially used operating revenue as the criterion for determining which carriers must comply.641 In the context of digital platforms, market share may prove a better proxy than operating revenues, given that it is the platform’s role as a gatekeeper or bottleneck—for which there are no real adequate substitutes—that gives rise to the relevant harms.

The prohibition should be centered on the activities that the platform facilitates as a bottleneck. Since a key goal of the separations regime is to eliminate the conflict of interest that arises when a dominant platform directly competes with the firms using the platform,642 only activity that would place platforms in direct competition in this way would be subject to the prohibition. This would not prevent platforms from integrating into lines of business that do not rely on the platform market. Nor would such a separations regime target conglomeration or vertical integration categorically; it would instead focus on platform entry into markets that creates the ability and incentive to discriminate, to leverage dominance, and to use information collected on firms as customers against them as competitors.

2. Distinguishing Between Platform and Commerce. — Applying separations to digital platforms would likely raise the challenge of identifying what constitute distinct products or services. In Microsoft, for example, the court had to determine whether the operating system and the browser—the two products the government claimed Microsoft had “tied”—should be considered a single integrated system.643 Microsoft argued that bundling new functionality into old products was a basic component of technological evolution.644 A similar issue may arise with digital platforms: Android, for example, could claim that certain apps must be integrated with its operating system in order to provide basic functionality or for technical necessity.

The traditional metric for assessing whether a set of bundled products constitute separate products is consumer demand. In Microsoft, the D.C. Circuit relied on Jefferson Parish’s consumer-demand test to determine whether consumers preferred a choice in browsers.645 Applying a similar inquiry in the platform context could similarly help identify whether integration of distinct functionalities should be viewed as an integrated system or as a platform. Regulators would also have the capacity to determine, over time, whether certain apps or features were necessary for basic functionality and whether the benefits of integration were sufficiently high to offset any potential harms to innovation. There may also be specific apps or functionalities where innovation is less likely to be transformative, and therefore where integration may prove fewer risks. As with earlier regimes, periodic reassessment and revisions would prove necessary to ensure the separation continued to accord with and reflect evolving market realities.

3. Institutional Mechanism and Timing. — A separations regime separating platforms and commerce could be implemented through statute or rulemaking or as antitrust remedies (under existing or new antitrust law). A statute from Congress could also establish the principle of separating platforms from commerce—as was the case with banking— with the specific authority to design and implement separations delegated to an agency. This approach would benefit from having an expert agency design and revisit the separation. Absent new legislation, the FTC could use its Section 5 authority to implement a separations principle through rulemaking.646 Designing separations only through rulemaking would require the agency to create rules of general applicability and— absent a specific congressional mandate—could limit the agency’s ability to structure highly tailored separations. Antitrust remedies would be costlier and take significantly longer, requiring the government or a private party to successfully show anticompetitive conduct and effects stemming from a digital platform’s involvement in multiple markets.

Given the enfeebling of antitrust doctrines that police single-firm anticompetitive conduct—and the judicial requirement that remedies be carefully tailored to competitive harm—this path is likely to be significantly more challenging.647 Previous instances of structural separations offer a few models for structuring these prohibitions. An operational or functional separation requires the firm to create separate divisions within the firm, requiring that a platform wishing to engage in commerce may do so only through a separate and independent affiliate, which the platform may not favor in any manner. A full structural separation, by contrast, requires that the platform activity and commercial activity be undertaken through separate corporations with distinct ownership and management. For example, the functional approach would permit Alphabet to operate Google search and vertical services that produce content so long as the two complementary services are structured as separate affiliates. The second option would prohibit Alphabet from running both the platform service and the complementary service, requiring that one be spun off and run by an independent owner.

It’s not clear that anything short of a full structural separation would be sufficient, especially given the risks of information misappropriation. While running complementary services as affiliates could be accompanied by information firewalls, the efficacy of firewalls requires close monitoring.648 Evidence shows that the antitrust agencies have neglected to fully monitor and enforce conduct remedies in the past.649 Moreover, firewalls may prove especially difficult to monitor in the context of digital platforms, given the heightened information asymmetries between private platform firms and public enforcers. It is possible that the risk of information misappropriation may vary by platform—but dominant platforms should carry the burden of establishing why operating complementary services as affiliates would not be anticompetitive.

Finally, a basic challenge facing regulators and enforcers when dealing with high-tech industries is the role of timing. Because these markets can evolve quickly, market changes can render regulatory interventions obsolete.650 Similarly, the failure to intervene can leave exclusionary conduct unchecked, resulting in path-dependent reductions in innovation. Any subsequent attempt to impose separations should include a built-in review process every two to three years, to ensure that the remedy still matches the market conditions.65

#### Digital start-up entry prevents slow growth – only a competitive technology sector stimulates the economy.

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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).

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.

#### Slow growth causes extinction.

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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.

### 1AC – Plan

#### The United States federal government should adopt the principle of separating platforms from commerce for platforms in the private sector.

### 1AC – Dependency Trap

#### Contention two: Dependency Trap

#### Digital platform conglomeration generates a dependency trap that threatens inclusive growth – separating platforms from commerce protects small firms in the developing world.

Buthelezi & Hodgeet ’21 [Thembalethu; Principal Economist @ Economic Research Bureau of the Competition Commission of South Africa; and James; Chief Economist @ Economic Research Bureau of the Competition Commission of South Africa; “Competition and Consumer Protection Policies”; The United Nations; https://unctad.org/system/files/official-document/ditccplp2021d2\_en\_0.pdf; AS]

Making markets more inclusive not only addresses social imperatives, but also can make markets more competitive and benefit consumers. Most economists see a large and vibrant small business sector as essential in providing dynamism, growth and employment opportunities to an economy. Digital start-ups play the same role, especially in terms of dynamism through innovation. Consumer benefits may manifest themselves in lower prices, but equally important are the benefits from greater choice, and better privacy protection and innovation. Indeed, the open banking initiative in the United Kingdom has seen the most benefits from increased innovation by challengers but also the incumbents that have been forced to innovate more with their own data, which is now also accessible to challengers.

However, there is a distinct risk that the digital age could threaten this inclusion in two ways. First, there is a risk that digital markets are dominated by developed economy global giants exploiting the vast economies of scale and scope that exist. Second, there is also a risk that digital markets become dominated by a few large digital conglomerate firms even if they are domestically owned.

Conglomeration is a clear trend in digital markets, with larger digital platforms rapidly moving into adjacent markets, including producing or providing the products sold on their platforms. This is in stark contrast with the most recent trend of the industrial age, which is to focus on core competencies and abandon conglomeration which was often punished by investors. Various factors are driving this trend. One is the economies of scope associated with data gathered or consumers accessing those platforms, which can then be monetized in various ways. Rather than exchanging this data, firms have sought to exploit it themselves. Amazon’s move from online retailing of books to all other products, including its own brands, is a classic case. A second is the enormous resources at their disposal. For example, Amazon invested early in data centres to support the development of its e-commerce activities but then later decided to enter the market for cloud services (through Amazon Web services).44 The third way that inclusion 44 Bourreau M and de Streel A. (2019). Digital Conglomerates and EU Competition Policy. CRIDS Namur Digital Institute. can be undermined is that the control of consumer access enables platforms to displace those that depend on it. Amazon and Google shopping are examples for commercial goods, but Facebook and Apple do the same with apps.45 Finally, the observation of global trends indicate that digital conglomerates are much more likely to acquire start-ups than be challenged by them.46 Conglomeration is not only a global platform phenomenon. The same economic forces can support local conglomeration. South Africa has its own Internet giant, Naspers, which built its position through acquiring shares in Chinese social networking and gaming firm Tencent early on. Naspers has been building its local e-commerce and digital online platforms, in part through a series of acquisitions. It has also been expanding the product range of such platforms. Furthermore, the gradual expansion of the highly successful South African healthcare insurer Discovery into life insurance, short-term insurance and now banking is a more “old economy” example of how such data and consumer access can be leveraged into adjacent markets.

Conglomeration by global and local digital market firms has the potential to negatively impact inclusion, even if there is sufficient competition among these larger players to maintain price and non-price market outcomes at competitive levels. This is particularly concerning in the South African context, where market concentration levels are already high, and the likely impact of increased conglomeration are heightened barriers to entry for potential entrants since the large digital platforms become “gatekeepers” to access markets.

Therefore, from a competition policy perspective, more needs to be done to ensure that digital markets are also open to domestic start-ups and challengers, and that global firms share in the rewards that they derive from developing markets. Locally, additional tools will be required to address the threat of conglomeration. For example, merger control needs to be revisited not only for killer acquisitions, which have attracted most attention, but also to combat increased conglomeration through merger creep. Such acquisitions do not necessarily kill a potential competitor, but rather gives the conglomerate platform a foothold in an adjacent market that can be leveraged later.47

Merger control also needs to be alert to the removal of a potential entrant of another sort. In a developing country context, there is also a tendency for global platforms to acquire the largest local home-grown platform rather than enter themselves. Such mergers deny consumers the benefit of additional competition and a potentially less concentrated market in the future. In addition, taking a tougher stance on conglomerate strategies, such as self-preferencing, exclusive and most favoured nation agreements, may also be appropriate. In its draft buyer-power enforcement guidelines48 the CCSA has already highlighted that behaviour such as self-preferencing would be considered as unfair trading practice by dominant online platforms that bring together thirdparty suppliers and consumers, such as e-commerce platforms.

Developing domestic firms to compete in this space is another area for competition and even industrial policy. Online businesses can sell products globally without a physical presence in the countries they service. Such global reach and costless replication mean that the previous drivers of localized production are frequently left out. For instance, transport costs for raw materials, import tariffs or domestic distribution all provided a rationale for a local presence. That rationale may be missing in many (but not all) future digital markets. As a result, the driving force of innovation and back-end jobs created by these firms may remain in their headquartered country, leading to even greater exclusion of developing countries. Furthermore, global platforms may choose to shift their profits to low-tax jurisdictions – a strategy not necessarily viable for local platforms – that provide these global firms with a significant competitive advantage over local platforms.

If this is to be avoided, then developing countries will need to provide industrial policy incentives for global firms to station operations in their jurisdictions. It will also need to support the development of local digital firms to participate in the digital age, much like the infant industry arguments of old times. It will also require investment in skills and capital financing. This must include the funding of research through universities and will require regulators such as the CCSA to invest in-house talent focused on digitalization of the economy.

Policymakers and regulators in developing countries must also focus their efforts on how to support entrepreneurs to unleash these opportunities and deconcentrate markets. Doing so would directly address the twin objectives of competition policy, namely, more competitive and more inclusive markets. This support may be best achieved through proactively unblocking whatever hindrances remain for these digital entrants, particularly from incumbent firms. Ownership of data and access to consumers or distributional channels are market features that favour large firms purely by dint of their size and incumbency, rather than guaranteed superior product offerings.

3. Data portability and interoperability

Data is seen as a source of significant advantage in the digital age. Data is also the basis for many new and old services. While data portability and interoperability are at the heart of loosening the ~~FAAGs’~~ [GAFA’s] gatekeeper power, there is also tremendous scope for a general regime on data portability and interoperability to open markets to new innovative businesses, while ensuring privacy and security of personal data. Such a regime may be an effective tool in addressing the market power of existing “brick and mortar” incumbents by reducing barriers to entry, allowing new entrants to disrupt traditional industry and have an impact across all markets. Data is not the only area. The European Union expert report’s findings on digital markets around strategies to frustrate new entry deployed by digital firms also resonate to a large extent with existing old economy platforms such as financial service Consideration needs to be given to whether such rule changes should have broader application in markets where incumbents fight digital disruptors. Another benefit of a proactive approach is that it may well prevent emerging digital markets from becoming concentrated and less inclusive over time. A potential advantage of developing countries is that some of these digital markets are not as well developed, or there is still scope for new entry and market growth as a large part of the population is not yet connected. This means that there is still space to keep these markets competitive and not have the difficult task of either regulating entrenched monopolists or seeking to develop entrants in their presence. After all, if there is one lesson for competition policy from the ~~FAAGs’~~ [GAFA’s] debate, it is that it is extremely hard to address economic power once it is in place, especially for a competition regulator in a developing country.

The European Union expert report on digital markets has suggested a shift in onus for dominant digital firms on certain conduct.50 However, a developing country competition regulator should also consider whether there are additional rules which could be imposed even on non-dominant digital firms to ensure competitive markets in the future. For example, rules on data interoperability, limitations on most favoured nation or best price clauses, and limits to self-preferencing on digital platforms more generally could be imposed in competition law enforcement regardless of dominance. Limiting large platforms from selling in competition with those that access consumers through them might be another area for consideration.51

#### Structural separations between platforms and commerce equalize international bargaining power – now is key to prevent feedback effects from locking in dependency.

Johannsen & Gonzalez ’21 [German; PhD Candidate and LLM @ Max Planck Institute for Innovation and Competition; and Andrés; LLM and Chilean Competition Law Compliance Officer; “Digital Platforms & Economic Dependence in Chile Any Room for Competition Theories of Harm without Dominance?”; https://law.haifa.ac.il/images/ASCOLA16/GJAG.pdf; 15 June 2021; AS]

1. Platforms and economic dependence

As transactions —both economic and social— move to the Internet, the role of digital intermediary platforms (hereinafter "platforms") in the economy has increased as facilitators of interactions between the several economic agents (users, buyers, sellers, advertisers, suppliers, etc.). At a global level, some platforms have reached a large size, in some cases becoming part of digital conglomerates with a multinational presence, among which are the so-called TechGiants.7 In Chile, while there is a consolidated presence of platforms that base their business on exploiting the attention of users (e.g. social networks or video platforms), in other sectors platforms are in early stages of expansion8 (e.g. e-commerce in Chile9 ).

In their expansive or developing stage, the platforms seek to increase the amount of users who interact through them. In general terms, more users on one side of the platform, gives more value to the users of that side and/or the other sides (direct and indirect network effects). Already in the world-renowned US Microsoft case this effect was reported when it was pointed out that developers preferred writing applications for operating systems that had enough consumers, and consumers preferred operating systems that already had multiple applications, an effect that is recognized as a barrier to entry.10 Additionally, in the data economy, the more members, the more and better data, which allows for improved service/user experience (databased network effects).11 In other words, by acting as an intermediary, the platform captures revenue, but also internalizes positive externalities, adding value to its whole infrastructure. The positive feedback generated by network effects, in addition to economies of scale and scope, can lead to a platform reaching a size where, for its rivals, it is no longer profitable to compete.12 Once this tipping point is reached, it is easier for the platform to win the whole market.13 This economic rationale defines how and for what purpose platforms compete. On the other hand, the platforms' business models seek to create a long-term relationship with users and suppliers.14 In this regard, the platform can track those who participate in it (via personal accounts and devices) and extract data to create profiles, study preferences and predict behaviour.15 This generates efficiencies related to the personalization of services, which reduces the efforts to match supply and demand. The information obtained from the data analysis generates value that, added to the positive network externalities, increases switching cost for users and suppliers.16 Regarding users, switching costs could be lower if they interact through several platforms (multi-homing).17 However, many times this is not the case since users incur in convenience costs or the platform sets strategies to make muti-homing unlikely.

18 Regarding suppliers, switching costs also depend on whether they had to adapt their technology and business model to the platform’s requirements. 19 Increasing switching costs can make it unrealistic for a provider to switch platforms and still operate in an economically viable way.20 The result is an asymmetry of bargaining power to the detriment of those who depend on the platform. In other words, there is an economic dependence, asis known in comparative doctrine.21 The brick-and-mortar retail sector,22 several agro-industrial sectors,23 and in the context of digital platforms show different market structures leading to dependence. 24 Yet, in the latter, there are two major differences. On one hand, economic dependence can be a decisive factor in the winner-takes-all race. On the other hand, platforms can be placed in a strategic position, as the orchestrator of marketplaces where other players —most of them not rivals of the platform— are going to compete. Therefore, it is critical to understand to what extent economic dependence regarding a platform may affect the wellfunctioning of the market.

2. Dominant power and uneven bargaining power

Economic dependence accounts for an unequal distribution of bargaining power.25 This imbalance allows the holder of such power to exercise aggressive negotiation strategies both at the contractual level (e.g. tied sales, arbitrary interruption of trade relations) and extracontractual level (e.g. refusal to buy or sell), which end up imposing an excessive economic burden on the weaker party. In comparative law, this type of uneven bargaining power is often called superior bargaining position or relative market power26 (hereinafter, indistinctly, “bargaining power” or “relative power”). The exercise of relative market power can have, in turn, a feedback-loop effect, as it reinforces the existing situation of economic dependence.

Regarding digital platforms that provide services as a distribution channel, their strategic position as an intermediary and the size of suppliers who offer goods through it —many of which are small or medium businesses— allows them to be in a position of relative power visà-vis many suppliers. Under these circumstances, the platform can incur in various forms of abuses. The most obvious would be to increase unilaterally the commissions for transactions or enter into exclusivity contracts. A less obvious would be to use the information it obtains as intermediary to favour the marketing of its own branded products 27 or deny access to data that is relevant to users (e.g. about recommendations) and suppliers (e.g. about ranking).28 Not being able to access such data can increase the cost of switching platforms, as it makes data portability more difficult, which in turn may increase the degree of dependence.

While these commercial practices are a manifestation of economic and contractual freedom, in some cases they might be abusive as they could undermine good faith and/or fairness in commercial relationships. In other words, these normative foundations serve as a basis for establishing a boundary between practices with relative market power that are socially acceptable and those which are not. Both at a national and comparative law, the materialization of this dividing line is found mainly in the field of contract law and unfair commercial practices laws. 29

On the other hand, from the perspective of the market’s functioning, although imbalances of bargaining power are inherent in all markets —so much so that they are usually considered a sign of competition—, 30 the exercise of relative market power could, under certain circumstances, cause negative effects on the market structure. As such, a second normative foundation for limiting relative market power could be competition. 31

For instance, taking the commissions’ example, if the platform’s relative market power allows it to raise commissions only to certain suppliers, the resulting differentiated charges can lead to a downstream distortion of competition. 32 On the other hand, in the refusal to grant access to data example, while a vertical-bilateral approach would enable a claim for damages generated on those who cannot access their data, a horizontal-collective approach allows an analysis of whether there are artificial barriers that obstruct competition in the platform market. Moreover, the imposition of exclusive distribution clauses or other formulas that increases switching costs can cause the same effect. 33

Platforms have incentives to be the first to adopt this type of strategy, because by doing so they can take advantage in the winner-takes-all race. 34 In this context, one of the main questions is when these aggressive strategies should be regarded as anti-competitive. To this end, competition law usually resorts to the rule of dominance.35 Dominant power is a legal fiction that —based on economic parameters— distinguishes whether a firm has sufficient market power to behave with independence from competitors36 and/or customers37 on a constant basis. If so, their behaviour is scrutinised to assess whether it has an economic justification or, on the contrary, whether it was carried out to exclude competitors or exploit the market. Yet, in digital platform markets (and in the data economy in general) this rule faces several difficulties.38 First, since platforms have multiple sides, it is complex to understand the distribution of power among them.

39 Second, in the data economy it is complex to know what the true utility or value of a company's accumulated data is and how important it is to access this data for third parties to compete.40 On the other hand, the rule of dominance seems not able to handle all cases of economic dependence threatening competition. Indeed, according to the examples we saw, a third difficulty is that there could be a scenario of dependence distorting downstream or upstream competition (where the platform does not compete, or competes, but is not dominant). Finally, a fourth difficulty is that, even without dominance, a platform can make strategic use of dependence to reach a position of dominance that will later allow it to win the whole market.

#### Structural separations can reorient the coordinates of geo-economic power – smart economies need smarter regulations.

Gurumurthy ’20 [Anita et al; Executive Director of IfTC and Expert Advisor for the UN Secretary General; “Unskewing the Data Value Chain: A Policy Research Agenda for Equitable Platform Economies”; (September 1, 2020); Available at SSRN: https://ssrn.com/abstract=3872492; AS]

Development is about how developing countries can move out of highly competitive activities with low margins to higher value activities with higher knowledge premiums, a process that has been recognized as structural transformation (Mann & Iazzolino, 2019). Fuelled by digital intelligence, all sectors of the economy are today undergoing a rapid makeover; a transition that requires developing countries to ensure that their productivity gains and digital capabilities are in a virtuous cycle. However, the “intelligence premium” harvested by dominant platform-lead firms in global data value chains constitutes a barrier to entry, impairing the global competitiveness of developing countries (Gurumurthy et al., 2019). The private enclosures of data and digital intelligence unfairly cement the competitive advantage of rich countries in global data value chains and thwart the potential for structural transformation of developing countries. Hence, while the data paradigm presents an urgency for systemic coordination towards national digital industrialization, it also represents a highly contested faultline in global resource redistribution.

The development question for the digital economy then is this: how can the data value chain be unskewed for redistributive equity and inclusion?

This conundrum has been the topic of significant, even if nascent, debates. Both traditional and new age policy proposals are being put forth from various quarters: institutional reform proposals from multilateral agencies and regional political blocs such as OECD, policy review assessments initiated at the national level, and unconventional and radical solutions from progressive civil society networks and scholars.

The emerging proposals can broadly be divided into three main areas: reining in Big Tech power, carving out a new resource governance regime for data resources, and building intelligence infrastructure capabilities in the Global South. Admittedly, many of the ideas involved are fledgling and demand in-depth exploration and robust debate before they can coalesce into clear and effective policies. But the juggernaut of Big Tech impunity and a yawning democratic deficit in global/regional policies in critical areas like trade, taxation and capital flows demand bold and agile action that eschews incremental, status quoist measures. They call for a conceptual overhaul that accounts for the realpolitik of geo-economic power.

The following sections take stock of noteworthy policy proposals that have emerged in each of the three areas, examining them critically and posing priority directions for a research agenda11 that can answer the following questions:  How are current policy directions and emerging institutional mechanisms able to address questions of market fairness and economic equity in the digital economy?  How do emerging global policy frameworks on data and AI impact national development priorities and pathways?

Area 1. Reining in Big Tech power through traditional policy instruments

In mainstream policy discourses in the digital arena, there is increasing recognition that competition and taxation policy reform are urgently needed to effectively curb Big Tech power in global data value chains.

With respect to competition policy, there is mounting consensus that industrial era competition law frameworks need to be overhauled so that they are able to effectively address the anti-competitive risks of network-data effects in data value chains. In 2020, the European Commission for Competition announced an in-depth study aimed at the updation of its merger assessment rubrics to address the realities of asset light, data heavy platform business models of the digital age (Modrall, 2020). The United States House Judiciary Committee has just concluded an investigation into the structural separations to be effected in data value chains to ensure that corporations controlling essential platform infrastructures are not also competing with the businesses that transact goods and services on them, the urgently needed “separation of platforms and commerce” that legal scholar, Lina Khan, has flagged in her study of Amazon’s antitrust behavior (Khan, 2017; 2019). Such interventions to overhaul traditional competition laws are urgently needed in the Global South as well.12

Currently, the European Union is exploring a limited form of structural separation by prohibiting specialized data sharing services from deploying the data that they transact for other uses, in an attempt to establish boundaries between data intermediation and intelligence services layers. But as the proposed regulation in its current form does not extend to cloud service providers, content intermediaries, and data exchange platforms developed in the context of IoT, it can be argued that this regulatory solution does not go far enough.13

#### Only the FTC can cooperate with foreign antitrust agencies to properly administer remedies.

Pachnou ’17 [Ms. Despina, Organization for Economic Co-operation and Development, “DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS COMPETITION COMMITTEE” https://www.ftc.gov/system/files/attachments/us-submissions-oecd-2010-present-other-international-competition-fora/et\_remedies\_united\_states.pdf]

5. The Agencies’ Cooperation with Foreign Jurisdictions on Remedies

18. Achieving effective remedies often entails cooperation with foreign jurisdictions. Such cooperation may allow the U.S. agencies to secure relief that sufficiently protects U.S. competition and consumers without applying the remedy to conduct or assets outside the United States. When an extraterritorial remedy is necessary to address harm or threatened harm to U.S. commerce and consumers, cooperation helps to minimize the risk of conflict with obligations of foreign laws or foreign remedial orders.35 Cooperation and coordination on remedies can be efficient for enforcers and the parties under investigation, especially given that over 130 jurisdictions have antitrust laws and over 80 require pre-merger notification. Cooperation may result in a remedies package that addresses competition concerns in multiple jurisdictions.36 The Agencies work closely with competition enforcers in other jurisdictions on cases under common review, including to help foster convergence and consistent remedy determinations.37

6. U.S. Case Examples

19. To the extent that the Agencies rely on extraterritorial remedies, they do so in both merger and conduct cases, although they arise most frequently in the merger context. In all cases, the Agencies seek remedies that are appropriately tailored and that do not apply extraterritorially unless necessary to address the harm or threatened harm to U.S. commerce or consumers.

6.1. Merger Cases

20. In most mergers, the Agencies can obtain an effective remedy for U.S. competition and consumers without extraterritorial divestitures or other relief. This is the case even when an Agency coordinates with other jurisdictions in investigating a transaction that raises concerns in both domestic markets and markets outside the U.S. Even in these instances, however, coordination between jurisdictions can be helpful. For example, the FTC benefited from coordinating with antitrust authorities in Canada, the EU, and Mexico during the investigation of Emerson Electric Co.’s acquisition of Pentair plc, even though the potential harm to U.S. markets was resolved exclusively through the divestiture of a U.S. switchbox facility.38 Similarly, in the General Electric-Alstom SA merger, effective relief for U.S. markets required divestiture of only U.S. based assets; however, coordination between the Department and the EC in connection with the Department’s investigation “facilitated [the Department’s] investigation and helped formulate remedies that [preserved] competition in the United States and internationally.”39 A coordinated remedy resulted in the Department and the EC announcing separate settlements that eliminated harm to consumers in their respective jurisdictions. 40 There are many more cases in which the Agencies have coordinated with their foreign counterparts on mergers that affect multiple jurisdictions.41

21. Although a merger may affect competition in several jurisdictions, the Agencies focus on preserving competition in the domestic markets that may be harmed by the proposed acquisition. On some occasions, relief secured by foreign jurisdictions means that no remedy, domestic or extraterritorial, is necessary to protect domestic competition. Though our experience in deferring to another authority’s remedy is limited, we have relied on informal deference and remain interested in doing so, under the right conditions. A notable example was in connection with Cisco’s acquisition of Tandberg in 2010. The Department declined to challenge the merger in part due to certain commitments that Cisco made to the European Commission (EC) to facilitate interoperability in products related to a type of videoconferencing called telepresence. Waivers of confidentiality by the parties and industry participants allowed the Department and the EC to cooperate closely in their parallel reviews of the transaction, resulting in an efficient outcome for the enforcers and the merging parties.42

22. Nevertheless, certain merger investigations resolved by consent decree have required the divestiture of assets located outside the United States to preserve competition within the United States. For example, the FTC consent decree resolving concerns regarding the merger of cement manufacturers Holcim Ltd. and Lafarge SA required, in part, divestiture of a Canadian cement plant and related U.S. terminals along with two Canadian terminals related to a U.S. cement plant. The FTC explained that the divested assets “remedy competitive concerns in northern U.S. markets [and are] part of a larger group of Holcim assets located in Canada that Holcim and Lafarge have agreed to divest to address competitive concerns raised by the [Canadian Competition Bureau (“CCB”)]. Commission staff worked closely with staff from the CCB to reach outcomes that benefit consumers in the United States.”

43 An extraterritorial remedy was also required to resolve Department’s investigation of the Anheuser-Busch InBev SA/NV & Grupo Modelo S.A.B. merger. The consent decree in that matter similarly required divestiture of a facility outside of the United States, the Grupo Modelo brewery in Mexico, and a perpetual and exclusive U.S. trademark license to the seven brands of beer that Modelo then offered in the United States, as well as three brands not yet offered in the United States, but currently sold by Modelo in Mexico. This remedy allowed the acquirer “to meet current and future demand for Modelo Brand Beer in the United States,” which resolved concerns that the merger would harm competition in twenty-six local U.S. markets.

#### Digital inequality undermines the LIO and sparks populist backlash.

Flaherty & Rogowski ’21 [Thomas; PhD Candidate and NSF Graduate Fellow @ University of California – San Diego; and Ronald; Distinguished Professor of Political Science @ University of California – Los Angeles, Weatherhead Scholar @ Harvard University; “Rising Inequality as a Threat to the Liberal International Order,” *International Organization* 75(2), p. 495-523; AS]

Presiding over the November 2016 meeting of the International Political Economy Society, which followed that year’s US presidential election by only three days, David Lake began by saying, “To our theories, this result unfortunately comes as no surprise.” And indeed the field at large has believed that the growing “populist”1 backlash against the Liberal International Order (LIO)—not just the Trump victory but Brexit, the election of illiberal governments in Hungary, Poland, Turkey, the Philippines, and Brazil (to name only a few), and growing support for anti-immigrant and illiberal parties and candidates in many other democracies—has followed almost inevitably from the very changes the LIO has wrought, including of course increased trade and migration but also one major concomitant, rising economic inequality within states. According to our traditional economic theories,2 advanced and even middle-income countries are abundantly endowed with human capital, and poorly endowed with low-skill labor. And it is a rudimentary implication of international economics that, in those countries, expanded trade—or, even more, immigration of low-skill workers—will benefit the highly skilled and harm the less educated. Inequality will rise, and—perhaps the most prescient conclusion of the traditional analysis—partisanship will correlate increasingly with possession of human capital: opposition to the LIO will be strongest among the least educated and will decrease monotonically with more years of schooling.

The evidence, which we survey briefly, admits of no doubt that in almost all of the wealthier (and not a few semiwealthy) countries, inequality has risen, often quite sharply; returns on education3 have risen markedly; and education, even more than occupational status, has emerged as one of the most important predictors of electoral support for antiglobalization parties. What our theories however did not anticipate, and so far cannot explain, may well prove to have been even more important:

1. Not all who are well endowed in human capital, but chiefly a very thin upper layer—the top 1 percent, or even 0.1 percent—have harvested most of the gains from globalization.

2. The antiglobalization movements we observe • adopt a populist rhetoric that often excoriates not just globalization or immigration but also allegedly nefarious elites, who conspire, both domestically and across borders, to enrich each other at the expense of their fellow citizens;4 • benefit chiefly parties of the radical Right; and • have in important cases attracted non-negligible support among university-educated segments of the electorate, albeit far less than among the less skilled.5

We suggest that the extreme inequality and the anomalies are related, and that some insights from recent work in international economics may help explain them. Three advances in trade theory predict extreme inequality. “New new” trade theory (NNTT), with its emphasis on superstar firms, offers a natural framework. So too does an “enriched” neo-H-O-S-S (Heckscher-Ohlin-Stolper-Samuelson) perspective that explores how superstar workers arise in the context of heterogeneous talent.6 Finally, economic geography, explored thoroughly by Broz, Frieden, and Weymouth in this issue, shows how globalization gives rise to superstar cities.7 These three trade theories predict top-heavy inequality primarily by allowing for unit heterogeneity—an assumption that the actors our traditional theories treated as identical actually differ in important ways. Firms within sectors differ in productivity, workers within a factor class differ in innate talents, and regions within countries differ in agglomeration economies.

None of this suggests, of course, that rising inequality is the only, or even necessarily the most important, cause of the growing popular backlash against the LIO. Skill-biased technological innovation and resistance to cultural change also matter, as we discuss more fully later. We do find, however, at least from a cursory analysis of European elections, that backlash against shocks from immigration and imports is conditional on high inequality, disappearing where inequality is low; and we suspect that rising “top-heavy” inequality is related to a particularly prominent strain, within the antiglobalization movements, of anti-elite and anti-expert sentiment.

We go on to suggest why rising inequality matters, not only as a source of opposition to the LIO but as an impediment to economic growth and an exacerbant of domestic polarization and international conflict.

We assess the implications of top-heavy inequality for the LIO. What remedies have been proposed? And if they lack sufficient political support, what sources of resilience can sustain the LIO under top-heavy inequality? Relatedly, we return to the question of why antiglobalization sentiment has benefited the political Right more than the Left. Finally, we chart a course for future research on models of top-heavy inequality, and discuss how they illuminate “blind spots” in the literature on international political economy.

First, however, we survey briefly the extent of growing economic inequality in advanced economies and its seeming relation, chiefly through a human-capital channel, to antiglobalization and anti-elite attitudes and voting.

Convergence Across Countries, Divergence Within Them

The triumph of the LIO in the 1980s and 1990s—the collapse of Communism, the dismantling of trade barriers, the strengthening of institutions of international governance—coupled with, and facilitated by, breakthrough innovations in transport, communication, and finance, affected economic inequality in two ways that standard factor-endowment theories predicted: inequality declined significantly between countries, thus beginning to erode three centuries of the Great Divergence between rich and poor nations; but inequality within countries, especially among the advanced economies, increased almost as sharply.

• Between countries. As late as 1990, the richest 10 percent of the world’s population earned on average over ninety times what the poorest decile received; only twenty years later, that ratio had fallen to sixty-five times,8 or only slightly more than the within-country ratio of Brazil, where in 2008 the average income of the richest decile was about fifty times that of the poorest.9

• Within countries. Beginning even earlier, inequality of incomes, whether measured as the Gini index or the share of total income accruing to the top decile, has risen in virtually all of the advanced economies,10 and indeed in many of the middle-income ones.11 Bourguignon notes that the collapse of the Soviet empire and the opening of China, India, and Latin America injected roughly “a billion workers, for the most part unskilled, into international competition.”12 That will have drastically lowered the global capital-labor ratio and hence further raised returns on human and physical capital, while reducing those on low-skill labor, in virtually all but the poorest, most labor-abundant countries. In short, across much of the globe, the enormous overall gains from trade have benefited the highly skilled, the inventive entrepreneurs, and the owners of capital; the incomes of the less skilled and the capital-poor have risen more slowly, stagnated, or actually declined—exactly the development whose early manifestations alarmed Dani Rodrik two decades ago.13

Surely not all of the rise in inequality stems from globalization.14 Many analyses attribute much of the widening within-country gap—in the US, perhaps as much as four-fifths15—not to globalization but to skill-biased technological innovation.16 Bourguignon contends, to be sure, that innovation has been largely endogenous to globalization: wider markets and intensified competition have raised the returns on cost-reducing innovation.17 Cheaper labor, however, whether from offshoring or the competition of low-wage imports, might be expected to curtail the demand for labor-saving technologies, not to increase it.18 A stronger case is implied by “new new” trade theory: if managerial pay correlates closely with firm size, and if the most successful firms in a globalized economy tend to be the largest, it follows that globalization contributes directly to the rise in top incomes.19 Perhaps most importantly, however, whatever skill-biased innovation may have contributed to the gains of the top quintile or decile, it can say little about the gains of the top 1, or 0.1, percent of the distribution.20 Trade, as we argue, can more readily explain those disproportionate gains.

Rising Skills Premia

Also consistent with mainstream theory were the rising returns on education and the widening gap between high- and low-skill workers’ attitudes toward trade and migration. Exactly as theory would lead us to expect, antiglobalization sentiment rose sharply, and was increasingly concentrated, among voters with the least human capital—that is, the less educated.

Returns on education have indeed risen sharply. In the US in the 1970s, workers with a college degree earned only about a quarter more than ones of comparable ethnicity and age who had completed only high school; by 2010, that gap had risen to almost 50 percent.21 The “raw” difference in annual earnings (i.e., without controlling for ethnicity and age) between college graduates and those who have completed only high school is now 64 percent in the US, and on average in the OECD economies 45 percent.22

At the same time, less educated voters have mobilized strongly against globalization in almost all of the advanced economies. In the US, whites with less than a college education, having up to the year 2000 differed little in their partisanship from whites with university degrees, began to tilt Republican in the early 2000s23 and supported Trump in 2016 by a margin of more than two to one (64 to 28 percent).24 In the Brexit referendum, similarly, 70 percent of voters with only a General Certificate of Secondary Education, roughly equivalent to a US high-school diploma, supported leaving the European Union, while those with university degrees voted by almost the same margin (68 percent) to remain.25 And a recent International Monetary Fund working paper finds that since 2002 tertiary (i.e., university or equivalent) education has correlated, more than any other single variable, with not voting for a populist party in European parliamentary elections—an effect that has grown only stronger since 2012.26

The Riddle of the 1 Percent

In many ways, then, a standard factor-proportions picture of globalization’s distributional and political effects holds up. What it cannot explain, as economists have by now noted repeatedly,27 is why so much of the bounty has gone to the top 1 percent and why even the remainder of the top decile, let alone the highly educated generally, have benefited comparatively little. This pattern is reflected in average real income trends since 1991 across five advanced economies (Figure 1). Much of the real income growth of the top 10 percent owes to gains by the top 1 percent (compare panels 1 and 2); the next 9 percent (i.e., the remainder of the top decile) have seen a comparatively paltry increase. At the same time, the incomes of next 9 percent, which stagnate or even decline after about 2000, mirror those of the middle 40 percent (compare panels 2 and 3). Taken together, the three panels demonstrate the extent to which a narrow elite has risen above the rest of society’s otherwise skilled workers.

Haskel and colleagues more vividly make this case in the US with data on returns on education, finding that the median income of the top 1 percent had risen by 60 percent between 1990 and 2010, while the returns on university education, even for holders of advanced degrees, had declined in real terms after about 2000, virtually erasing their modest gains from the previous decade.28

The seemingly inexorable rise of the 1 percent, when contrasted with the relative stagnation of the rest of the top decile, and of owners of human capital in the middle 40 percent, raises at least three questions. Can our standard theories be modified to explain this “top-heavy” form of inequality? Would such a modified theory still provide a plausible link to globalization? And does such a theory help us understand the simultaneously anti-elitist and antiglobalization character of recent populist movements?

Heterogeneous Workers, Firms, and Regions: Three Ways Globalization Affects Top-Heavy Inequality

We argue that the top-heavy inequality we observe is consistent with three recent advances in trade theory. Each highlights how the bulk of globalization’s gains concentrate in a narrow subset of superstar workers, superstar firms, or superstar cities. An “enriched” H-O-S-S model shows how globalization concentrates wages in a small share of highly talented workers. New new trade theory implies that globalization concentrates profits in a few multinational corporations. Finally, economic geography, extensively reviewed by Broz, Frieden, and Weymouth (in this issue), predicts that globalization concentrates economic growth in a few metropolitan regions.29 By producing far more extreme inequality than traditional models suggest, these theories may help explain the puzzling composition of antiglobalization interests and why these movements adopt a populist tone that demonizes elites.

In presenting these advances, we spare the reader their mathematical exposition and instead focus on their sometimes subtle intuitions. We then explore their similarities and differences, as well as how they illuminate the puzzles of LIO backlash.

Neo-H-O-S-S

The first advance injects new life into the increasingly disesteemed, yet still heavily used, factor-endowments framework of Heckscher-Ohlin and Stolper-Samuelson. It turns out that modest enhancements introduced by Haskel and colleagues yield productive insights into the puzzles of LIO backlash.30 The key amendment introduces heterogeneous workers with varying degrees of innate talent. To state briefly the salient and surprising implications of that model, a drop in the relative price of labor-intensive goods, whether induced by globalization or by technology, can not only reduce the wages of low-skill workers, as in traditional models, but also distribute almost all of the resultant gains to a thin layer of highly talented people—and, at least as importantly, induce stagnation, or actual decline, in the earnings of highly skilled but less talented workers.31 And, once we observe that such a shift is both quite recent and plausibly linked to globalization, we may have shed some light on (a) the rabidly anti-elitist and antiglobalization tinge of the populist movements, (b) why such movements have recently peaked, and (c) why they gain (and may well continue to gain) support not only from the “usual suspects” among low-skill workers but also from those with moderate or even relatively high endowments of human capital.32

For those who appreciate a more rigorous introduction, we offer a graphical exposition of the “richer” H-O-S-S model in online Appendix A2. More intuitively, the key to understanding that model is what happens to high-skill workers when the relative price of capital rises.33 First consider the unsurprising fact that within most firms, sectors, and professions, some workers possess natural talent while the majority are perfectly average. Naturally, the most talented employees are far more productive than their average colleagues, even when everyone works with the same amount of capital. In Hollywood, for example, all actors may read the same script, but only A-list talent like Meryl Streep, Denzel Washington, or Tom Hanks can turn that script into an Oscar-winning performance.

In the classic model, trade lowers wages and raises the relative cost of capital; in the enriched model, the owners of capital make up for that higher cost by lowering the wages of mediocre employees and raising the wages of superstars. Capital owners become less able to afford mediocre workers whose productivity cannot keep up with rising capital costs. Instead, they hire the superstars, whose superior productivity can more than cover the increased costs of capital.

Consider the Hollywood example that Haskel and colleagues used, where film scripts represent intellectual capital, indeed the most important form of capital for the entertainment industry. As the world’s tastes and purchasing power increase demand for Hollywood entertainment, the price of scripts rises—those of stellar scripts, most of all. As that price rises, studios or streaming services become less and less likely to hire actors of only middling quality to perform such a script. The studios’ investment in a high-quality script will pay off, and bring their film the requisite audience, only if it stars actors of extremely high talent: Robert Downey Jr., Scarlett Johansson, or Samuel L. Jackson (or all three in the same film!).34

Admittedly, this analysis assumes, rather than explains, that we can attribute the rise of the top 1 percent to differences in talent but a lot of evidence supports the thesis. For one thing, in almost all countries—including such improbable cases as France and Spain—half to two-thirds of the income of the top 1 percent consists of salaries (compensation for work). Rarely, in any present-day advanced economy, do returns on capital constitute more than a quarter of the incomes of the top 1 percent (in the US, it is less than 15 percent), Thomas Piketty’s arguments notwithstanding.35 As one observer notes, “The fact that so many of [today’s] top earners work for a living is striking,”36 given that a century ago the great majority of elite incomes came from investments in property, bonds, or equities. For another, the model accurately predicts the kind of “fractal” inequality that so far has seemed to prevail almost everywhere in advanced and semi-advanced economies.37 That is, inequality seems to have grown not only between, but within firms and occupations: the top lawyers, academics, physicians, middle managers, and even shop floor workers, have begun to earn far more than the median member of their profession, or even the median co-worker of equal qualifications in their firm.

Once we grant that such differences in talent can become important, the model suggests that any globalization-induced rise in the relative price of capital-intensive goods (or, equivalently, decline in the relative price of labor-intensive products) in advanced economies will depress (or threaten to depress) the wages not only of low-skill workers but also of high-skill ones of less than superlative talent. It thus raises the prospect that the growing resistance to global markets may be embraced, sooner rather than later, not only by low-skill workers but by a growing segment of those with higher education or advanced training.

New New Trade Theory

“New new” trade theory (NNTT) offers an alternative firm-centric view of top-heavy inequality.38 Whereas neo-H-O-S-S focuses on how workers of different talents select into different sectors, NNTT focuses on how firms of different productivity levels sort into import-export activities. One of its salient implications is that increases in foreign trade concentrate the distribution of profits into the largest and most productive firms in each sector.39

The intuition is simple: import and export activities require large upfront costs, such as setting up global logistics networks and investing overseas—costs that only the largest firms can afford. The benefits of trade, access to larger markets, for example, then make these large firms even larger, which subsequently allows them to out-compete their smaller domestic rivals. Armed with global economies of scale, superstars like Walmart and Amazon flood the domestic market with lowcost goods and services. This squeezes out the smallest firms, for example, local mom-and-pop establishments, while reducing the profits of the midsize firms, whose middling productivity permits them to sell only domestically. In sum, NNTT implies, and offers evidence to show, that superstar firms in each sector reap the lion’s share of the gains from globalization.

In its earliest formulation, NNTT implied no wage inequality, because it assumed workers to be homogeneous. Recent advances draw implications for wage inequality by allowing some profits to pass through to workers—what the literature calls rentsharing. One modification allows firms to screen, and bargain over quasi-rents with, workers of varying abilities.40 More productive exporting firms pay higher wages to attract higher-ability talent. In the end, rent-sharing allows inequality in firm profits to spill over into inequality in workers’ wages.41

NNTT implies that globalization-induced inequality should manifest itself principally at the level of the firm, pulling up the compensation of all workers in the larger and more successful firms, and leaving behind all of those employed in smaller, domestically oriented firms (or those unemployed through the demise of the smallest firms). This is exactly what Helpman and colleagues find in Brazil, where 70 percent of overall inequality occurs within sectors and occupational categories; similar results were obtained by Akerman and co-authors in an analysis of wage inequality in Sweden from 2000 to 2007.42

Economic Geography

Economic geography explores the origins and effects of one of society’s most readily observable features: the unequal distribution of economic activity across space, a phenomenon commonly called agglomeration.43 Broz, Frieden, and Weymouth (in this issue) document how globalization’s effects appear most clearly at the level of communities, and operate through the mechanisms specified by economic geography.44 Here we complement their account by situating economic geography within only the broader set of trade models that contribute to extreme inequality. Globalization, we contend, exacerbates regional inequality by inflicting economic stagnation and decline on all but a handful of superstar cities. The mechanism works through the joint effect of agglomeration forces and trade costs. Globalization facilitates the lowering of trade costs (not just those of transportation and communication, but also costs imposed by tariff policies), and this frees up firms to locate in the places that confer the greatest advantage.

The literature identifies many advantages to urban agglomerations. Large cities increase access to suppliers of intermediate inputs, as well as to transportation infrastructure, large pools of specialized talent, and diverse consumers. Moreover, they facilitate the exchange of information about changes in competition, technology, and consumer tastes.45 Some locations also offer a fixed advantage such as access to deep ports or natural resources. Overall, large cities exist and continue to grow because they confer some large basket of benefits on those who locate there.46 The link to globalization seems obvious: the cheaper transportation becomes, and the farther tariff barriers fall, the easier it is for firms and workers to realize the benefits of agglomeration.

For regional inequality to speak to the puzzle of earnings inequality, it must be true that changes in regional growth both reflect and pass through to the wages of resident workers. We find this plausible and consistent with evidence of the stark spatial inequality in returns on skills. A growing literature documents the “end of spatial wage convergence” since 1980, with the bulk of wage gains going to high-skill workers concentrating in just a handful of large cities.47 However, enormous wage inequality within the largest cities suggests that between-region inequality provides only a partial picture. In reality, heterogeneity among workers and firms likely overlaps with, and is accentuated by, the effects of large cities.

Notable Similarities and Differences

All three advances in trade theory point to the same pessimistic outcome, that globalization produces extreme inequality, where a narrow segment of society benefits to the exclusion of the rest. Each theory identifies a different set of “superstars” within this narrow segment: workers with superlative talents, extraordinarily productive firms, or urban agglomerations. Despite varying mechanisms, each arrives at the conclusion of extreme inequality by introducing some form of unit heterogeneity—an assumption that the actors we once treated as identical actually differ from one another in important ways. Workers of similar education differ in innate talent; firms in the same sector vary in productivity; and regions in the same country vary in their advantages of agglomeration. This heterogeneity suggests a radically different perspective on the politics of globalization, one where we should not be surprised that populist protectionist movements arise; that they vilify elites; or that, despite finding their base constituency among lowskill workers, they enjoy nontrivial support from high-skill workers across many sectors.

We highlight two differences among these theories. First, they arrive at the implication of extreme inequality by varying degrees of theoretical complexity. In this regard, neo-H-O-S-S offers a clear advantage: its general framework requires no added assumptions about heterogeneous firms, economies of scale, locational mobility, or rent sharing.

Second, and at least as important, is the empirical accuracy of key theoretical assumptions. In the case of NNTT, evidence for the crucial rent-sharing assumption is decidedly mixed.48 For economic geography, countries almost certainly differ in the degree to which factors are spatially mobile. The neo-H-O-S-S model of differently talented workers will enjoy the most traction in longer-run analyses of wage outcomes, where factors are fully mobile across sectors and regions. Overall, the evident variance in empirical support for different modeling assumptions should caution users to validate these assumptions in their particular research contexts.

Finally, these unit heterogeneity models are not mutually exclusive—they likely reinforce one another in interesting ways. The most talented workers can earn the highest wage by working for the largest firms that can afford them. Regional agglomeration facilitates this advantageous match by locating these superstar workers and superstar firms in the same city. Thus, the top-heavy inequality we observe may very well arise at the intersection of heterogeneous workers, firms, and regions.

Hypothesis

Under any of the three trade theories described here, globalization produces topheavy inequality, wherein a thin margin of workers benefits while the rest are left behind. This drives a populist strain of backlash that views globalization as a struggle of the masses versus the elites. To our mind, this casts a different light on recent research that sees the backlash as a response to shocks from immigration or imports. To state our key hypothesis:

H: when top-heavy inequality is high, shocks from trade, whether in goods, services, or factors of production, increase public support for populist parties.49 In the absence of top-heavy inequality, however, such shocks have no effect on support for populism.50

This assumes that inequality reflects the long-run wage effects of trade and migration. That is, if our trade theories accurately predict wage outcomes, then we should observe extreme, or top-heavy, inequality. As previously discussed, even though much of the inequality we observe does reflect trade patterns, inequality also derives from other sources, such as technological change.51

Inequality and Antiglobalization: Evidence from European Elections

We offer a very preliminary test of this hypothesis in the context of two recent studies of populist far-right vote shares in Europe. Their wide empirical coverage, spanning between them twenty-eight countries over twenty-six years (1988 to 2014), affords a high degree of external validity, at least among economically developed nations in recent decades. Also, the two studies focus on different aspects of globalizationrelated shocks, one on immigration and the other on imports. Finally, both papers offer rigorous research designs. In further examining and extending their findings, we introduce as few modifications as possible to the original designs.

Immigration and Inequality

The study by Georgiadou, Rori, and Roumanias (hereafter GRR) requires the least modification.52 It explores the role of immigration shocks and inequality in all national and European Parliament elections in the twenty-eight member states of the European Union between 2000 and 2014. In particular, the authors study, at the level of Eurostat’s NUTS-2 regions,53 the vote shares obtained by “populist radical right” parties,54 which rose dramatically in the wake of the 2008–09 financial crisis (from 0.05 to 0.15 mean vote share across all countries).

In their original analysis, GRR find a positive association between right-populist vote share and both inequality and immigration, controlling for unemployment, immigration, and economic growth.55 Figure 2 replicates this result under the model labeled GRR2018.56

IO2020 extends that model simply by interacting their measures of inequality and immigration. We report the coefficients in standardized units for visual comparability and ease of interpretation. These models are also posted in Table A2 in the online appendix. Two findings follow from our analysis. First, GRR’s original finding remains intact: an increase of one standard deviation in national-level inequality, all else equal, is associated with a 2.8-percentage-point increase in populist vote shares (p < .01). Since this exercise holds immigration constant, it suggests that inequality independently undermines support for the LIO. This likely reflects, as we discuss later in the paper, inequality’s well-known effects on economic growth, polarization, and external conflict.

Second, our interaction model produces strong evidence for our key hypothesis, that surges in populist support from immigration shocks (which GRR found to have a modest and imprecisely estimated effect) are important but highly conditional on the level of inequality: magnifying backlash at extreme levels and nullifying backlash at lower levels. We visualize this result in a marginal effects plot in Figure 3. The differences in magnitudes are impressive. A one-standard-deviation (0.3 percentage point) increase in the share of migrants in the local population is associated with precisely zero change in vote shares for populist parties at even moderate levels of inequality (Gini < 0.29). At high levels of inequality (Gini > 0.34), the same one-standard-deviation increase in the share of migrants relates to a twenty-point increase in vote share for populist parties. These magnitudes are striking, given that the average NUTS-2 vote share for these parties is 6 percent, with a maximum of 54 percent. Rising immigration, it seems, poses a populist threat to the LIO only when paired with an income distribution that is, or has become, highly unequal.

Imports and Inequality

That inequality mediates shocks from immigration raises the obvious parallel question: does it similarly mediate import-related shocks? To this end, we repeat the earlier analysis, this time employing the data set from Colantone and Stanig (hereafter CS), who examine “China trade shocks” in the European context: fifteen Western European countries over the years 1988 to 2007.57 They report strong effects of Chinese imports on vote shares for radical Right parties58 at the level of the electoral district.59 We replicate their principal results, including their two-stage least squares estimators,60 in specifications 1 and 2 of Table A3 (in the online appendix).

The CS data set does not include a measure of income inequality. To test our interactive hypothesis, we employ inequality measures from the World Inequality Database.61 We report top 1 percent shares of post-tax income at the country level.62 We also apply logarithmic transformations to address issues of fit resulting from extreme outliers.63 Finally, we adopt a multilevel estimator that serves our particular data needs.64 The results rely on this preferred hierarchical estimator.65 Table A3 (in the online appendix) documents how these modifications affect the original CS findings.66

The results for import shocks closely mirror those for immigration. Figure 4 plots the coefficients of our preferred model (IO2020) alongside a baseline model in CS (CS2018). As expected, the positive association between Chinese imports and populist vote shares is highly conditioned by inequality. The coefficient on the China shock remains significant only when interacted with top-1-percent income shares. The marginal effects plot in Figure 5 translates this into real-world terms. At low to medium top-heavy inequality (top 1 percent shares < 0.09), a one-standard deviation increase in imports (approximately 170 EUR per NUTS-2 worker) relates to no statistically significant change in district vote shares for populist parties—that is, no populist backlash from rising imports. However, in countries where the top 1 percent earns approximately 10 percent or more of national income, the same magnitude of imports is associated with a 25-to-50-percent increase in district vote shares, on average, for right-populist parties.

In combination with the results from immigration shocks, this analysis provides strong support for our hypothesis that the politics of LIO backlash are best understood from the perspective of the three recent advances in trade theory that predict topheavy inequality. Trade in goods, or in factors of production, in the context of heterogeneous firms, workers, and regions, produces top-heavy inequality that, we argue, sets the stage for a particularly populist form of backlash. We provide suggestive evidence from European elections that is largely consistent with this; migration and imports drive support for populist parties only where we observe high inequality.

Possible Remedies and Sources of Resilience

An optimistic reading of this analysis is that national redistribution provides an effective remedy against right-populist backlashes. This finding is consistent with the “compensation hypothesis,” that government redistribution to globalization’s losers increases public support for trade.67 Our paper contributes to this literature by suggesting that redistribution targeted at top-heavy inequality (superstar earners, regions, and firms) to the benefit of otherwise skilled workers in smaller firms and cities would be especially effective.

However, democracies famously fail to address rising inequality with redistribution.68 This leads us to a more pessimistic conclusion that, even though lower inequality increases support for globalization, there is little evidence that governments will redistribute in countries with already high top-heavy inequality. We therefore agree with Atkinson that more redistribution of the large gains from globalization would be both possible and effective; but mass support for it, paradoxically, is weak.69 There is hope for other policy suggestions, as well. Investment in education, even if it could achieve the requisite political support, would fail to address the central problem: outsized gains from “superstar” talent, cities, and firms. Global forms of redistribution, such as the world “Tobin tax” on cross-border financial transactions, promise to tax capital without encouraging capital flight. However, such visions have been dismissed as “utopian.”70 They would also raise the substantial issues of global governance that Rodrik’s “globalization trilemma” has highlighted: who would enact such a tax, and to whom would the revenues flow?71

Instead, governments are far more likely to enact protection—restrictions on imports and immigration that reduce welfare but undeniably also reduce inequality. Williamson shows that the choking-off of US immigration from the 1920s to the 1960s contributed significantly to the “great leveling” of American inequality, including the Great Migration of African Americans out of the US South, as Northern employers began to substitute Black for immigrant labor.72 Restricting low-wage imports would of course have a similar effect. These options offer the losers from globalization only a larger slice of a (likely much) smaller pie.

If governments under pressure from top-heavy inequality continue to substitute protectionism for redistribution, can the LIO that stands for globalization nonetheless be sustained? We see two possible sources of resilience. First, powerful interests in the LIO can be expected to defend it.73 Second, international institutions still matter. The retreat of the US, as a principal guarantor of the LIO, poses an undeniable threat to its institutions and to the peace and cooperation they foster. However, IR research cautions against premature reports of its demise. Despite declining US support, international institutions will continue to serve vital functions for their members—functions that make these institutions “sticky” in the face of shocks.74 More recent scholarship in this vein suggests that the international institutions that were hardest to create, and whose rules are flexible, are the most likely to weather the shock of declining US support.75 To the extent that other institutions were created with less effort and exhibit less flexibility, however, other powerful states will seek to install alternatives that better serve them.

Limitations and Future Research

Future research in this area will need to address at least three shortcomings of our analysis: imprecise measurement, identification, and external validity. First, our nationallevel measures of inequality cannot discriminate among the three possible trade theories, since all predict top-heavy inequality. One solution would require decomposition of earnings into worker, firm, and region heterogeneity.76 Future measures should also be mindful of several indirect routes by which inequality undermines the LIO, independent of globalization shocks. It slows economic growth,77 probably by restricting the formation of human capital.78 It exacerbates domestic polarization79 and, seemingly, induces aggressiveness in foreign policy, especially among less welloff voters.80 And, to the extent that it installs governments of the Right, it further increases inequality.

Second, the lack of a careful identification strategy leaves much for future research, which must isolate the variation in top-heavy inequality that is independent of technological change (as discussed earlier), institutions, and redistributive politics, among other sources of endogeneity. Instrumental variable approaches, such as those featured by Enamorado and colleagues, offer one promising direction.81

Future research will also need to account for non-economic aspects of globalization and inequality. Our analysis assumes that inequality operates narrowly through economic mechanisms. We doubt that material interests alone explain the variance in attitudes to globalization.82 Surely status anxiety and cultural threats matter too in ways not reflected in the theory here.83 We know that some voters do not consider trade salient enough,84 or find it too complicated,85 for economics alone to determine vote preferences. Relatedly, attitudes on trade and migration partially reflect sociotropism and out-group anxieties.86 Nonetheless, an at least equally large literature confirms that economic shocks accurately predict election outcomes,87 and our own analysis shows that these economic shocks especially drive voting where inequality is high. Clearly, both economic and cultural factors matter, probably in mutually reinforcing ways. To know for sure, future research will need to test our three trade theories with individual-level data.88 What we contribute to this important debate is a way to sharpen the way international political economy thinks about the economic side of globalization politics.

Third, future research will need to investigate whether these results extend, as recent research suggests,89 to low- and middle-income countries.90 We also expect, although we lack the data to prove it, that our analysis does not extend to support for left-populist parties.

Why does rising inequality move many voters toward right-wing populism rather than left-wing populism? Put simply, the Left’s failure to enact adequate redistribution91 has pushed many of its own voters to support right-wing parties whose protectionist policies offer a plausible alternative to redistribution.92 In the US, the pattern of “Obama-toTrump” voters, particularly among less educated workers, is well documented.93 In Germany, the right-populist Alternative für Deutschland received about 15 percent of its support from traditional left-wing parties in 2017, and similar patterns seem to have driven support both for France’s Le Pen and for the right-populist FPÖ (Freedom Party) in Austria.94 In all three cases, manual workers demonstrably form the core of right-populist support.95 These shifts from redistributive to protectionist parties, we suspect, are exacerbated by the Left’s growing association with elitism, expertise, and globalization: all things that those farther down in the income distribution have come to distrust, or even to despise.

Conclusion

The openness to trade in goods, services, and factors of production the LIO has so effectively advanced over decades has concentrated real income growth in a very thin layer of workers. While this rise in top-heavy inequality doubtless has other causes, chief among them skill-biased technological innovation, trade openness has contributed mightily, particularly since the “China shock” of 2001;96 and certainly the populist movements that reject the LIO cast openness to trade and migration as the chief villain.

The ways in which rising inequality has threatened the LIO expose lacunae in international political economy’s intellectual apparatus—“blind spots” that require remediation. Most importantly, our basic economics are, if not wrong, at least outdated. The field’s adherence to classical trade models blinds us to the distributional effects revealed by top-heavy inequality: far more people lost from globalization, and fewer gained, than traditional theories (factor proportions and specific factors) suggested. While economists rapidly updated their trade models to account for the emerging reality of extreme inequality, political science largely stayed the course —and ran the danger, now realized, of misapprehending the domestic politics of globalization.

The trade literature offers three explanations for top-heavy inequality. The “enriched” Heckscher-Ohlin model of Haskel and colleagues shows how only a thin layer of extraordinarily talented individuals within the larger set of high-skill workers unambiguously benefits from a rise in the relative price of a skill-intensive product; the wages of both the less talented high-skill and the low-skill workers stagnate or fall.97 New new trade theory shows how a similarly narrow subset of very large and productive firms, and their employees, absorb the bulk of trade’s gains at the expense of all other firms. Finally, economic geography suggests that trade concentrates economic growth in a few large metropolitan regions while inflicting stagnation and decline elsewhere. Each offers a pessimistic view of the politics of globalization in which variously defined superstars gain a far larger share than the society at large.

We validate these theories of top-heavy inequality with data on local election outcomes from as many as twenty-eight countries over twenty-six years. We find that public support for right-populist parties rises dramatically with exposure to imports and immigration, but only in those countries with high top-heavy inequality. The fact that the huge gains from trade and technology have flowed to such a small elite, while earnings in other categories have stagnated, may go far to explain why the antiglobalization movements blame not only crucial elements of the LIO, but increasingly a small and nefarious global elite, for what one politician luridly portrayed as the “carnage” among many regions and sectors of the advanced economies.

That these movements, with rare exceptions, seek relief in restrictions on trade and migration from populist movements of the Right, rather than in redistribution or training, probably owes much to the failure of the political Left to redistribute sufficiently.98 That so much of these parties’ electoral support, both in Europe and in the US, comes from manual workers and former supporters of the political Left lends credence to this conjecture.

The ill effects of rising inequality, however, extend well beyond the rising tide of antiglobalization movements and politicians. They extend to slower economic growth (bound to exacerbate existing resentments), increased political polarization, and even a heightened risk of international conflict.

While eminent scholars have advanced quite plausible and growth-enhancing remedies for rising inequality, none elicits, or seems likely to elicit, sufficient political support. Tragically, inequality will likely be reduced, in any serious way, only by what Scheidel has accurately counted as one of history’s “great levelers,” our current high-mortality pandemic.99 While COVID-19 mercifully inflicts nothing approaching the death toll of history’s worst plagues, in the long run its combined effects of labor shortage, capital abundance, and panicky deglobalization will likely result—despite short-term unemployment and recession—in greater equality (but also less prosperity) in the advanced economies, greater inequality in the less developed countries, and greater between-nation inequality. Those developments may partially reduce developed-country hostility to the LIO; but, to survive, the LIO will have to find stronger sources of resilience among business elites and political leaders.

We thus conclude by disagreeing with Lake’s morning-after observation about the 2016 election. While it seemed that the populist backlash came as “no surprise” to the field of international political economy, some of its most important aspects, including the link to top-heavy inequality and the rejection of elites and expertise, were neither foreseen nor understood by our conventional theories. As Abraham Lincoln said during an earlier time of trial, “As our case is new, we must think anew and act anew.”100

#### LIO collapse causes extinction.

Harari ’20 [Yuval Noah; Professor in Department of History @ Hebrew University of Jerusalem; “How to Survive the 21st Century: Three Existential Threats to Humanity,” *Journal of Data Protection & Privacy* 3(4) p. 463-468]

As we enter the third decade of the 21st century, humanity faces so many issues and questions, that it is really hard to know what to focus on. So I would like to use the next 20 minutes to help us focus on all the different issues we face. Three problems pose existential challenges to our species. These three existential challenges are nuclear war, ecological collapse and technological disruption. We should focus on them. Now nuclear war and ecological collapse are already familiar threats, so let me spend some time explaining the less-familiar threat posed by technological disruption. In Davos, we hear so much about the enormous promises of technology — and these promises are certainly real. But technology might also disrupt human society and the very meaning of human life in numerous ways, ranging from the creation of a global useless class to the rise of data colonialism and of digital dictatorships. SOCIO-ECONOMIC UPHEAVAL Automation will soon eliminate millions upon millions of jobs, and while new jobs will certainly be created, it is unclear whether people will be able to learn the necessary new skills fast enough. Suppose you are a 50-year-old truck driver, and you just lost your job to a self-driving vehicle. Now there are new jobs in designing software or in teaching yoga to engineers — but how does a 50-year-old truck driver reinvent himself or herself as a software engineer or as a yoga teacher? And people will have to do it not just once but again and again throughout their lives, because the automation revolution will not be a single watershed event following which the job market will settle down into a new equilibrium. Rather, it will be a cascade of ever bigger disruptions, because artificial intelligence (AI) is nowhere near its full potential. Old jobs will disappear, new jobs will emerge, but then the new jobs will rapidly change and vanish. Whereas in the past humans had to struggle against exploitation, in the 21st century, the really big struggle will be against irrelevance. And it is much worse to be irrelevant than exploited. Those who fail in the struggle against irrelevance would constitute a new ‘useless class’ — people who are useless not from the viewpoint of their friends and family, but useless from the viewpoint of the economic and political system. And this useless class will be separated by an ever-growing gap from the ever more powerful elite. THE AI REVOLUTION CREATING UNPRECEDENTED INEQUALITY BETWEEN CLASSES AND COUNTRIES In the 19th century, a few countries like Britain and Japan industrialised first, and they went on to conquer and exploit most of the world. If we are not careful, the same thing will happen in the 21st century with AI. We are already in the midst of an AI arms race, with China and the US leading the race, and most countries being left far, far behind. Unless we take action to distribute the benefit and power of AI between all humans, AI will likely create immense wealth in a few high-tech hubs, while other countries will either go bankrupt or become exploited data colonies. Now we are not talking here about a science fiction scenario of robots rebelling against humans. We are talking about far more primitive AI, which is nevertheless enough to disrupt the global balance. Just think what will happen to developing economies once it is cheaper to produce textiles or cars in California than in Mexico? And what will happen to politics in your country in 20 years, when somebody in San Francisco or Beijing knows the entire medical and personal history of every politician, every judge and every journalist in your country, including all their sexual escapades, all their mental weaknesses and all their corrupt dealings? Will it still be an independent country or will it become a data colony? When you have enough data, you do not need to send soldiers in order to control a country. THE RISE OF DIGITAL DICTATORSHIPS AND GLOBAL MONITORING This danger can be stated in the form of a simple equation, which I think might be the defining equation of life in the 21st century: B ×C×D =AHH! Which means? Biological knowledge multiplied by computing power multiplied by data equals the ability to hack humans, ahh! If you know enough biology and have enough computing power and data, you can hack my body and my brain and my life, and you can understand me better than I understand myself. You can know my personality type, my political views, my sexual preferences, my mental weaknesses, my deepest fears and hopes. You know more about me than I know about myself. And you can do that not just to me, but to everyone. A system that understands us better than we understand ourselves can predict our feelings and decisions, can manipulate our feelings and decisions and can ultimately make decisions for us. Now in the past, many governments and tyrants wanted to do it, but nobody understood biology well enough, and nobody had enough computing power and data to hack millions of people. Neither the Gestapo nor the KGB could do it. But soon at least some corporations and governments will be able to systematically hack all the people. We humans should get used to the idea that we are no longer mysterious souls — we are now hackable animals. That is what we are. The power to hack humans can be used for good purposes — like providing much better healthcare. But if this power falls into the hands of a 21st-century Stalin, the result will be the worst totalitarian regime in human history. And we already have a number of applicants for the job of 21stcentury Stalin. Just imagine North Korea in 20 years, when everybody has to wear a biometric bracelet that constantly monitors your blood pressure, your heart rate, your brain activity 24 hours a day. You listen to a speech on the radio by the great leader, and they know what you actually feel. You can clap your hands and smile, but if you are angry, they know, you will be in the gulag tomorrow. And if we allow the emergence of such total surveillance regimes, do not think that the rich and powerful in places like Davos will be safe, just ask Jeff Bezos. In Stalin’s USSR, the state monitored members of the communist elite more than anyone else. The same will be true of future total surveillance regimes. The higher you are in the hierarchy — the more closely you will be watched. Do you want your chief executive officer or your president to know what you really think about them? So it is in the interest of all humans, including the elites, to prevent the rise of such digital dictatorships. And in the meantime, if you get a suspicious WhatsApp message, from some Prince, do not open it. Now if we indeed prevent the establishment of digital dictatorships, the ability to hack humans might still undermine the very meaning of human freedom. Because as humans will rely on AI to make more and more decisions for us, authority will shift from humans to algorithms and this is already happening. Already today billions of people trust the Facebook algorithm to tell us what is new, the Google algorithm tells us what is true, Netflix tells us what to watch, and the Amazon and Alibaba algorithms tell us what to buy. In the not-so-distant future, similar algorithms might tell us where to work and who to marry, and also decide whether to hire us for a job, whether to give us a loan, and whether the central bank should raise the interest rate. And if you ask why you were not given a loan, and why you the bank did not raise the interest rate, the answer will always be the same — because the computer says no. And as the limited human brain lacks sufficient biological knowledge, computing power and data — humans will simply not be able to understand the computer’s decisions. So even in supposedly free countries, humans are likely to lose control over our own lives and also lose the ability to understand public policy. Already now, how many humans understand the financial system? Maybe 1 per cent, to be very generous. In a couple of decades, the number of humans capable of understanding the financial system will be exactly zero. Now we humans are used to thinking about life as a drama of decision-making. What will be the meaning of human life when most decisions are taken by algorithms? We do not even have philosophical models to understand such an existence. The usual bargain between philosophers and politicians is that philosophers have a lot of fanciful ideas, and politicians basically explain that they lack the means to implement these ideas. Now we are in an opposite situation. We are facing philosophical bankruptcy. The twin revolutions of infotech and biotech are now giving politicians the means to create heaven or hell, but the philosophers are having trouble conceptualising what the new heaven and the new hell will look like. And that is a very dangerous situation. If we fail to conceptualise the new heaven quickly enough, we might be easily misled by naïve utopias. And if we fail to conceptualise the new hell quickly enough, we might find ourselves entrapped there with no way out. Technological disruption of not just our economy, politics and philosophy but also our biology In the coming decades, AI and biotechnology will give us godlike abilities to reengineer life, and even to create completely new life forms. After four billion years of organic life shaped by natural selection, we are about to enter a new era of inorganic life shaped by intelligent design. Our intelligent design is going to be the new driving force of the evolution of life and in using our new divine powers of creation, we might make mistakes on a cosmic scale. In particular, governments, corporations and armies are likely to use technology to enhance human skills that they need — like intelligence and discipline — while neglecting other humans skills – like compassion, artistic sensitivity and spirituality. The result might be a race of humans who are very intelligent and very disciplined but lack compassion, artistic sensitivity and spiritual depth. Of course, this is not a prophecy. These are just possibilities. Technology is never deterministic. In the 20th century, people used the same industrial technology to build very different kinds of societies: fascist dictatorships, communist regimes, liberal democracies. The same thing will happen in the 21st century. AI and biotech will certainly transform the world, but we can use them to create very different kinds of societies. And if you are afraid of some of the possibilities I have mentioned, you can still do something about it. But to do something effective, we need global cooperation. GLOBAL PROBLEMS THAT DEMAND GLOBAL SOLUTIONS Whenever a leader says something like ‘My country first!’ we should remind that leader that no nation can prevent nuclear war or stop ecological collapse by itself, and no nation can regulate AI and bioengineering by itself. Almost every country will say, ‘Hey, we don’t want to develop killer robots or to genetically engineer human babies. We are the good guys. But we can’t trust our rivals not to do it. So we must do it first’. If we allow such an arms race to develop in fields like AI and bioengineering, it does not really matter who wins the arms race — the loser will be humanity. Unfortunately, just when global cooperation is more needed than ever before, some of the most powerful leaders and countries in the world are now deliberately undermining global cooperation. Leaders like the US president tell us that there is an inherent contradiction between nationalism and globalism, and that we should choose nationalism and reject globalism. But this is a dangerous mistake. There is no contradiction between nationalism and globalism. Because nationalism is not about hating foreigners. Nationalism is about loving your compatriots. And in the 21st century, in order to protect the safety and the future of your compatriots, you must cooperate with foreigners. So in the 21st century, good nationalists must be also globalists. Now globalism does not mean establishing a global government, abandoning all national traditions or opening the border to unlimited immigration. Rather, globalism means a commitment to some global rules. Rules that do not deny the uniqueness of each nation, but only regulate the relations between nations. THE WORLD CUP: AN EFFECTIVE MODEL FOR GLOBAL COOPERATION The World Cup is a competition between nations, and people often show fierce loyalty to their national team. But at the same time, the World Cup is also an amazing display of global harmony. France cannot play football against Croatia unless the French and the Croatians agree on the same rules for the game. And that is globalism in action. If you like the World Cup — you are already a globalist. Now hopefully, nations could agree on global rules not just for football, but also for how to prevent ecological collapse, how to regulate dangerous technologies and how to reduce global inequality. How to make sure, for example, that AI benefits Mexican textile workers and not only American software engineers. Now of course, this is going to be much more difficult than football — but not impossible. Because the impossible, well we have already accomplished the impossible. We have already escaped the violent jungle in which we humans have lived throughout history. For thousands of years, humans lived under the law of the jungle in a condition of omnipresent war. The law of the jungle said that for every two nearby countries, there is a plausible scenario that they will go to war against each other next year. Under this law, peace meant only ‘the temporary absence of war’. When there was ‘peace’ between — say — Athens and Sparta, or France and Germany, it meant that now they are not at war, but next year they might be. And for thousands of years, people had assumed that it was impossible to escape this law. But in the last few decades, humanity has managed to do the impossible, to break the law and to escape the jungle. We have built the rule-based liberal global order that, despite many imperfections, has nevertheless created the most prosperous and most peaceful era in human history. Peace has changed ‘Peace’ no longer means just the temporary absence of war. Peace now means the implausibility of war. There are many countries that you simply cannot imagine going to war against each other next year — like France and Germany. There are still wars in some parts of the world. I come from the Middle East, so believe me, I know this perfectly well. But it should not blind us to the overall global picture. We are now living in a world in which war kills fewer people than suicide, and gunpowder is far less dangerous to your life than sugar. Most countries — with some notable exceptions like Russia — do not even fantasise about conquering and annexing their neighbours. Which is why most countries can afford to spend maybe just about 2 per cent of their gross domestic product on defence, while spending far, far more on education and healthcare. This is not a jungle. Unfortunately, we have gotten so used to this wonderful situation that we take it for granted, and we are therefore becoming extremely careless. Instead of doing everything we can to strengthen the fragile global order, countries neglect it and even deliberately undermine it. The global order is now like a house that everybody inhabits and nobody repairs. It can hold on for a few more years, but if we continue like this, it will collapse — and we will find ourselves back in the jungle of omnipresent war. We have forgotten what it is like, but believe me as a historian — you do not want to be back there. It is far, far worse than you imagine. Yes, our species has evolved in that jungle and lived and even prospered there for thousands of years, but if we return there now, with the powerful new technologies of the 21st century, our species will probably annihilate itself. Of course, even if we disappear, it will not be the end of the world. Something will survive us. Perhaps the rats will eventually take over and rebuild civilisation. Perhaps, then, the rats will learn from our mistakes.

### 1AC – NEW

#### Contention three: Systemic Risk

#### Societal collapse is inevitable – dominant platforms are too big to fail – digitalization is financialization on steroids.

Curran ’20 [Dean; Assistant Professor in Sociology @ University of Calgary, PhD in Sociology; “Connecting risk: Systemic risk from finance to the digital,” *Economy and Society* 49(2), p. 239-264; AS]

The risks of tightly-coupled universal intermediaries

Irrespective of the importance of these insights into systemic fragility, insofar as we are interested in its impacts on overall social life, then the identification of the fragility of a system is only part of the problem. The other key question is: how important is this specific system to the overall functioning of society? To provide one set of contrasting examples, both pre-2008 finance and the Ryanair flight network in the summer of 2017 were systems that exhibited extremely low levels of redundancy and significant fragility to disruption (see Financial Times, 2017). Yet, Ryanair’s cacophony of cancelled and delayed flights was an inconvenience to a small portion of the population of Europe, while the stuttering of the credit provision system in finance resulted in a massive social crisis. As such, not only is the risk that a system will cease to function properly important, but insofar as we are oriented to systemic social risk and the potential for social crises, we must also focus on the level of dependence of society on this system. While existing approaches have focused on the fragility of a network, insofar as the intention of the analysis is to tack closely to the point of the social science study of risk – the potential damages to society – then the vulnerability of society to breakdowns in the network is just as important as the vulnerability of the network in itself.

This is what makes systemic financial risk so problematic in the twenty-first century. Firstly, finance has become interconnected to the point where it is a single, though highly uneven, system in which almost all parts are vulnerable to any other part of the financial system. Secondly, society as a whole exhibits very little redundancy vis-à-vis this single private finance system. Through its monopoly on credit provision and the near universality of employment of credit by corporations and private individuals, this network of contemporary privately-run financial institutions is increasingly emerging as a universal intermediary. Finance itself does not make anything, but it has increasingly become a single network that is a fundamental means to the provision of a vast array of other social functionings.13 Credit has become so central to economic processes across society that some bankers could speculate that, if the state had not intervened after the Lehman bankruptcy, grocery stores could have run out of food as their credit ran dry (Luyendijk, 2015). In this context, through financial institutions’ role as fundamental intermediaries in complex financial networks of interdependence, the failure of the system of privately owned finance would have disrupted everything else that depends on these networks of financial interdependence for continued functioning. Consequently, the ‘financialization of daily life’ (Langley, 2008; Martin, 2002), in which credit plays an increasingly fundamental role in commercial transactions, is not merely a massive sea change in subjectivities and a financial strategy for financial institutions to increase the scope of profit-making activities – it is also a systemic increase in the tight-coupling of society vis-à-vis the financial system. In this way, the proper functioning of the credit system itself has become a necessary condition to the reproduction of an ever greater number of social functionings – thus causing a massive increase in social dependence on this single, private system of finance.

Insofar then as universal intermediaries exhibit systemic fragilities there is significant potential for systemic social risk that can result in social crises, as emerged from the global financial crisis of 2008. Reducing this vulnerability can proceed via either making the system that is the intermediary more stable or through reducing its power as a necessary condition by generating other, independent ways of securing the goods to which this system is a means. This point, while not made explicit in the risk literature, is an important insight that can be generated by bringing together literatures on organizational and legal power and ecological, systemic risk. Almost all of the literature on contemporary finance focuses on making the system more stable, though there are also important treatments on replacing the private system of credit provision with a public system. Yet, from a social systemic risk perspective, the contemporary financial system is so dangerous not only because it is fragile and susceptible to crises, but because there is no back-up or alternative to contemporary global private finance for society. Reducing social dependence on credit and/or providing other forms of credit provision, including public and non-profit that are not integrated into the networks of interconnection of the existing private system, could not only provide greater security from systemic financial risk, but also massively reduce the necessary-condition-power of private finance that makes bailouts so difficult to avoid.

This is likewise where the ‘networked digitalisation of daily life’, akin to the financialisation of daily life, is increasingly important. As with the role of finance as an intermediary, digital giants are developing massive platforms that increasingly mediate almost all the basic functionings that human beings seek to achieve (Mansell, 2012; Srnicek, 2017).14 With the status of increasingly a universal intermediary for different social functions, if any of these platforms were to fail, all of the networks of dependence that rely on that platform would in turn fail. As banks enjoyed intermediary power as a means of enjoying market power, the major digital companies, including Apple, Alphabet, Amazon, Facebook and Microsoft are doing all they can to heighten their intermediary power by making themselves increasingly indispensable to more and more social and economic functions.

As with finance, this growing systemic risk should not be viewed simply as a relatively exogenous process of growing interdependencies due to globalization and technological development (cf. Centeno et al., 2015; Goldin & Mariathasan, 2014; World Economic Forum, 2015), but rather as fundamentally intensified by the pursuit of private efficiencies and monopoly power so as to realize profit and value maximization. Exemplified in the Silicon Valley ideology of ‘Unless you are breaking stuff … you are not moving fast enough’ (Zuckerberg in Anthony, 2017), the dependence of society on specific digital platforms continues to grow. The potential for ‘Schumpeterian profits’ from impeding competition by occupying the role of essential intermediaries for different social functions thus likewise intensifies the systemic risk associated with the failure of any of these digital giants.

As with contemporary finance, these digital giants seek to exhibit universal intermediary power. Insofar as they are necessary conditions to key functionings of our life, they exhibit a kind of dual power, that enables them to appropriate massive levels of economic rents due to their monopolistic position (Mazzucato, 2018), while also creating immense risks for society when they fail to successfully fulfil their roles – thus making it a core social interest that they not fail in their function. In these cases, companies, through what has been called ‘infrastructural imperialism’ (Vaidhyanathan, 2011) have sought to insert themselves as a universal means to the goods of our lives. More recently, cities themselves have been increasingly targeted by ransomware, which have threatened to bring urban governance to a halt. After a cyber attack hobbled Atlanta in 2018, which cost millions of dollars to recover from, in 2019 more than 40 municipalities in the United States have been hacked. These include major cities such as Albany and Baltimore, several smaller cities in Florida, along with 22 towns across Texas, which have been simultaneously afflicted (Fernandez & Sanger, 2019). As Wu (2010), has shown, insofar as digital companies appropriate these public ‘common carrier’ positions – including providing the infrastructure through which cities function – they become part of the critical infrastructure of social life. Yet, by enabling such a systemically risky system as the contemporary digital economy to develop in a manner that both amplifies the risk of the system itself and the social dependence on this system, we repeat the mistakes that were made in the lead-up to the 2008 financial crisis.

While at this point these cyber-attacks may be considered a considerable harm rather than a crisis, the growing infiltration of networked devices throughout our basic infrastructure associated with the revolution in IoT 15 and the potential for an entire networked smart city means that a level of interconnectedness implicit in current dynamics of innovation would turn a penetration at the scale of WannaCry or NotPetya, or the cyber-security and safety failures of AWS or Mirai, into a social catastrophe, in which the basic infrastructure of the city or an entire region could be disabled, or used as a tool for even more damaging cyber or infrastructural attacks. While cybersecurity is sophisticated and more can be done on this front, it is in many ways fighting a losing battle of trying to patch over an excessively interconnected and fragile system, on which we are increasingly intensely dependent. As Hypponen declares, summarizing the security status of digitally interconnected devices, ‘Whenever an appliance is described as being ‘smart’, it’s vulnerable’ (Hypponen & Nyman, 2017, p. 5). And yet the current trajectory is ever-greater damages as companies continue to work towards their goals of ever-greater network integration of social, material and political life with the digital economy.

With the growing complexity of digital interconnections – both within the digital system and at the human-digital interface (see Greenfield, 2017) – mismatches between the knowledge of programmers who create the code for software and the impacts that software’s vulnerabilities have continue to grow. This mismatch thus further intensifies the space for avoiding responsibility for the damages promulgated across these systems. As Naughton (2017) has highlighted, legal responsibility in the digital economy is rarely even close to commensurate to the damages wreaked through the failures of their created products. That it has not been seriously broached that any of the companies above be held even partially legally culpable for the collateral damages due to the breaches of their software exemplifies the extent to which the digital economy is dominated by intermediaries that are always seeking to further install themselves in people’s basic functionings and general capabilities, but are not held responsible when their intermediary roles are suspended – even when there are enormous path-dependent negative side-effects from breaches and breakdowns. The massive complexity of the networks of information they have contributed to creating and the inchoate nature of the damages they enable, which interact with many other causes – that is, they are not solely responsible for Russian political influence or the damaging of political discourse, but their business models play a definite, but indeterminate role in these processes – institutionalizes a kind of structural recklessness and irresponsibility at the centre of digital innovation.

While a critical, reflexive systemic risk analysis cannot be used to predict the future, it can aid in identifying important vulnerabilities that create the potential for system-wide risks. High levels of interconnectedness, complexity, low redundancy and high levels of mismatch between activity and knowledge, alongside low culpability is a toxic combination that created the conditions for a social crisis in 2008. Likewise this toxic combination is increasingly being manifested in the contemporary networked digital economy, which could generate another systemic social crisis that, given the existing scope and granularity of dependence of social life on digitally networked devices, potentially could be of even greater proportions.

#### 1 – Interconnectedness and lack of redundancy – it guarantees global internet and infrastructure collapse.

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Systemic financial and digital risk

The digital economy, which comprises ‘those businesses that increasingly rely upon information technology, data, and the internet for their business models’ (Srnicek, 2017, p. 4), is increasingly presenting itself as a hegemonic business model, which requires its own analytical treatment (Srnicek, 2017; see also Bauer & Latzer, 2016; Elder-Vass, 2016). Issues of risk and crisis raised by the financial crisis are particularly relevant to the emerging study of the digital economy in the face of the significant impacts from recent cyberattacks WannaCry and NotPetya and several breaches of confidential data, including 145 million people’s data held by Equifax and over 100 million held by Capital One.

While the shorthand of ‘digital economy’ is often and usefully used (Bauer & Latzer, 2016; Elder-Vass, 2016), core to this revolution is not simply the shift from analogue to digital, but in particular, the shift towards the use of computing devices that are networked. 4 As such ‘digital economy’ is employed as shorthand for the ‘networked digital economy’. This section further develops the framework for investigating emerging systemic risk proposed above, while also advancing evidence for the claim that the contemporary digital economy is manifesting systemic risk characteristics that have important similarities to the systemic risk characteristics of pre-2008 crisis finance. To pursue this dual task, I briefly develop a comparative systemic risk analysis of pre-crisis finance and the digital economy with respect to the following characteristics: interconnectedness and redundancy; interactive complexity, and mismatches between scope of knowledge and activity. Each of these subsections introduces brief illustrative cases to both clarify how to use this framework, or ‘toolbox’ of the political economy of systemic risk, and to provide prima facie evidence that significant digital systemic risk, and as is subsequently shown below, significant social systemic risk, is emerging from the current trajectory of the digital economy.

Problems of interconnectedness and redundancy in finance and the digital economy

As has been widely discussed in the literature on the 2008 financial crisis, in the lead-up to the crisis, the financial institutions that comprised the financial network became much more interconnected to the rest of the network, which increased the likelihood that solvency problems of one financial institution could threaten many other institutions in the network (Goldin & Mariathasan, 2014; Haldane, 2009; May et al., 2008). Alongside the growing interconnectedness of the financial network was a trend towards reduced redundancy, as banks significantly increased their leverage levels (Haldane et al., 2010). With increasing levels of leverage (the ratio of assets to equity), each financial institution had less back-up equity to employ when one of its investments failed to provide its anticipated return.

In the context of high interconnectedness and low redundancy, the failure of a small number of investments (such as when two of Bear Stearns’ hedge funds collapsed in July 2007) or, alternatively failure by an institution’s counterparty to meet their obligations (as occurred with Lehman Brothers in September 2008) could propagate risk across the network as these losses in turn created problems of liquidity and solvency for other counterparties and so on throughout the entire network (see Haldane, 2009). As the literature has previously discussed, with many investment banks having leverage ratios of 30 to one, losses of little more than 3 per cent could cause a bank to be insolvent (Curran, 2015; Haldane et al., 2010). With such a tightly connected network of firms and such little redundancy, the network was primed to have losses cascade throughout the network, until an institution with much greater levels of redundancy, the state, stepped in and ended the cascading losses through bailouts and stimulus packages.

In terms of analysing interconnectedness in the digitally networked economy, it is one of those few sectors that is considered to be even more connected than global finance. The growing scale of computing devices and their connection via the internet is a widely noted phenomenon (see Goldin & Mariathasan, 2014), with the internet being described as the world’s largest network (Perrow 2007, p. 249), and as a ‘world-spanning living organism’ (Pentland 2009, in Zuboff, 2015, p. 85). Moreover, this growth of connectivity has been extremely rapid, with not only massive increases in the number of digitally interconnected devices, but also the types of devices that are being connected continuing to proliferate (Schneier, 2018).

In terms of redundancy, while the internet is a massive network – which enables potential connection between any two devices that have IP addresses – it has been noted that the physical infrastructure of the internet exhibits a reasonably high level of redundancy. Even if one of the root-level servers was to be disabled, the system would be able to adjust, thus enabling continued availability of internet services (Perrow, 2007). Nevertheless, on top of this physical infrastructure of the internet has developed a series of oligopolistic or monopolistic providers of key services on the web such as Amazon, Apple, Google, Facebook and Microsoft, while Alibaba, Baidu and Tencent, occupy similar levels of market dominance in China (Webb, 2019). While monopolistic market structures are primarily viewed from a pricing perspective, market dominance also raises important questions from a systemic risk perspective that have only been addressed within the sector of finance. As such, while there is some recognition of the importance of ‘systematically important financial institutions’ (FSB, 2011), there has not yet been a corresponding regulatory recognition of the systemic risk associated with ‘systematically important digital institutions’. These dominant firms have become key nodes that support a vast array of web services, which in turn support a multitude of social practices. Google has eight products that have over one billion users, while Amazon, Microsoft, and Facebook exhibit similar levels of market dominance in their respective markets (Lardinois, 2018; Mazzucato 2018). This political economic structure of the digital economy, which benefits from the network effects of digital information markets (Hindman, 2018; Srnicek, 2017), alongside light-touch regulation (Curran, 2018), consequently has built a much more centralized functional web onto of the distributed technology of the internet.

Given the interoperability and interdependencies within these companies, the monopolistic, centralized nature of the web provision creates the potential for vulnerabilities to cascade widely through the web, even if the physical infrastructure is distributed. As Perrow (2007) has emphasized, having many systems that utilize the same software systems leaves them open to ‘commonmode’ failures, where a potential failure or breach anywhere in the network can lead to multiple, potentially cascading failures due to the systems being vulnerable to the same failure. The economic centralization of the infrastructure of the web thus leads to the potential for the identification and exploitation of a single vulnerability leading to the failure of thousands or even potentially millions of computing devices, which are vulnerable to the same weakness.5

The WannaCry cyberattack exemplifies the growing importance of the systemic fragilities involved with cyber risk, and on a truly global scale – affecting over 100 countries worldwide – based on the identification and exploitation of a single key vulnerability in Microsoft software (Larson, 2017). In terms of its impacts, one-third of the UK’s National Health Service (NHS) was rendered inoperative, Chinese students were locked out of their university files, over 1,000 computers at Russia’s interior ministry were disrupted, as were billion dollar businesses, such as FedEx and Telefónica. In total it is estimated that over 230,000 computers were infected by WannaCry (Thomas, 2019) and the costs of the attack are estimated at somewhere between $4–8 billion (Greenberg, 2018). For WannaCry, the malware took advantage of a vulnerability in Windows, which had been previously developed by the US-based NSA into an attack tool for its own hacking operations. This penetration tool, EternalBlue – based on a key ‘zero-day vulnerability’ for Windows operating systems – was stolen from the NSA and subsequently leaked on the internet in 2017 so that others could use it for cyber-attacks.

In evaluating cyber-threats there are three commonly discussed criteria for computer security: confidentiality, availability and integrity (Schneier, 2018). Confidentiality is that only parties that are authorized gain access to the information held on a system. Availability involves the continued access and functionality of computing services to authorized parties. Integrity involves only authorized parties making changes in a computer system.6 In the lead-up to WannaCry, one of, if not the most, sophisticated hacking groups in the world, the NSA, were unable to keep their own hacking tools confidential.

The EternalBlue vulnerability was again used the following year in the NotPetya malware. The NotPetya ransomware attack is considered the most costly attack yet, with estimates that it cost companies over $20 billion, while also shutting down key infrastructure (Clarke & Knake, 2019, p. 18). In this case, it was vulnerabilities in the update servers of a Ukrainian software company, Linkos, that provided a back door to thousands of computers in Ukraine, which enabled the hackers to release the NotPetya malware (Greenberg, 2018). NotPetya ‘crippled multinational companies including Maersk, pharmaceutical giant Merck, FedEx’s European subsidiary TNT Express, French construction company Saint-Gobain, food producer Mondele¯z, and manufacturer Reckitt Benckiser. In each case, it inflicted nine-figure costs’ (Greenberg, 2018).

Again, as with WannaCry, there were cascading effects on economic and material life. One example of its impacts is instructive, especially given the primary business model of the internet of maximizing connectivity and data collection and analysis.7 The Danish logistics company, Maersk, was hobbled by the attack. While Ukraine was the original target, given Maersk’s role in the global supply chain, ‘an attack on Maersk strikes everywhere at once’ (Greenberg, 2018). With a single breach of Maersk’s systems due to the installation of the unknowingly infected software in Odessa, this led to problems around the globe, as the malware caused the failure of a key ‘choke point’ in its shipping terminal system. This led to the closure for the day of 17 of its 76 terminals, including New Jersey, Los Angeles, Algericas (Spain), Rotterdam, and Mumbai, leading to massive delays and further problems given the focus on efficiencies and just-in-time deliveries in the global supply chain (Greenberg, 2018; see also Goldin & Mariathasan, 2014). While the software on Maersk’s ships were not infected, the terminals’ software had been wiped away, such that for ‘days to come, one of the world’s most complex and interconnected distributed machines, underpinning the circulatory system of the global economy itself, would remain broken’ (Greenberg, 2018).

The NotPetya attack is estimated to have cost Maersk $300 million; however, luckily the fundamental principle of the digital economy – connect (and collect) everything – was unintentionally violated in this case. In seeking to rebuild the logistics systems that plan how to sort and arrange their shipping process, a copy of the ‘domain controllers’, which serve as a map to the network, needed to be found. Maersk though had been syncing together all 150 domain controllers, and hence, in a clear case of the risks of the ethos of growing, almost reckless interconnectivity, all were wiped out by the NotPetya malware, except one, which remained exempt from the syncing process because a blackout in the Ghanaian office prior to the NotPetya infection had rendered the machine offline and disconnected from the network when NotPetya struck.8

As this case illustrates, a component can only serve effectively as redundancy if it is not too tightly-coupled to the network. If there is a high correlation between the failure of the part and its ‘back-up’ then there is not effective redundancy; yet the push to connectivity tends to infect all the parts in the case of an infection. In this case, redundancy was achieved, through a core principle of systemic risk minimization (modularity) unintentionally trumping the business model of the digital economy, of maximizing connectivity and interdependence.

Software increasingly functions as a core part of the infrastructure of our economic, social and political world. Yet, unlike the modularity of conventional infrastructure, networked software exhibits a series of interdependencies and potentialities for ‘common-mode’ failures that provides scope for an initial, single infection somewhere in the globe to cascade across the globe. Yet, despite the growing accumulation of costly ‘near-misses’ (see Perrow, 1984) little has changed in the fundamental business model of the digital economy, or of governments’ refusal to regulate for the systemic risk that is emerging from this massive growth in interconnectedness. In fact the digital economy aims to ever further increase the connectedness of life through the Internet of Things (IoT) (Schneier, 2018).

#### 2 – Complexity – monopolization of the digital economy makes the IoT vulnerable to cyber-attacks.

Curran ’20 [Dean; Assistant Professor in Sociology @ University of Calgary, PhD in Sociology; “Connecting risk: Systemic risk from finance to the digital,” *Economy and Society* 49(2), p. 239-264; AS]

Complexity in finance and the digital economy

In addition to the risks emerging from being a highly interconnected and low redundancy network, high levels of complexity in finance played a key role in the lead-up to the financial crisis of 2008. Perrow (1984) provides a basis for distinguishing between the risk properties of different types of complexity through his differentiation between linear complexity and interactive complexity. Linear complexity involves a system with many parts, but the interactions between these parts are linear, visible and generally predictable. Interactive complexity involves relations between parts that are not linear, such that there is a much greater chance of one component of the system interacting with and impacting components in many different parts of the system.9 This distinction is akin to Haldane’s (2009) distinction between more modular complexities, where there are relatively separable sub-structures, and interactively complex systems, where any part of the system exhibits a higher likelihood of dependence on any other part of the system in highly unpredictable, irregular ways. For the purpose of exposition, these two types of complexity will be called separable complexity and interactive complexity.

The lead-up to the financial crisis is widely acknowledged as having experienced a massive increase in the complexity of the financial system. Simple, short-chain securitization is consistent with risk reduction strategies (Engelen et al., 2011); however, complex forms of securitization led to such a level of opacity and unpredictable interactions between different financial transactions, and ultimately financial institutions, that a ‘modest increase of seriously delinquent subprime mortgages’ of 3 per cent ($34 billion) led to the fundamental disruption of the $57 trillion US financial system (Dodd, 2007).

In terms of the level of complexity that was reached in the years leading up to the 2008 crisis, ABS CDOs (Collateralized Debt Obligations in which the underlying assets are Asset-Backed Securities), can provide a useful illustrative case. ABS CDOs were a particularly complex security, in which the underlying components were bundles of different tranches of a series of ABSs. The tranches of these ABSs were built out of thousands of mortgages, with the different tranches classified based on the probability of default of their underlying mortgages, with the AAA tranches offering lower rates of return due to greater security, while the lower tranches (including BBB and BB) offering higher rates of return in compensation for a higher probability of default (see Financial Crisis Inquiry Commission, 2011, p. 73). ABS CDOs (which the Financial Crisis Inquiry Commission just calls ‘CDOs’) were then made out of the ‘mezzanine tranches’ of ABSs, in particular the AA, A, BBB and BB tranches, which were more difficult to sell because of the higher risk attached to them. Through constructing a new security by pooling together these different tranches, the sellers of these investments were able to claim that the process of creating ABS CDOs reduced correlation between assets through diversification and hence these mezzanine tranches were then sold as securities in which the majority of the ABS CDO was rated AAA (80 per cent), despite being made almost solely of higher probability of default securities (see Financial Crisis Inquiry Commission, 2011, pp. 127–129). The repackaging of these securities provided important arbitrage opportunities, especially because of the symbolic value attached to AAA rated investments. The resulting losses from these complex forms of securitization though played a key role in the lead-up to the 2008 financial crisis (MacKenzie, 2011, pp. 1779, 1782–1786).

In addition to high levels of interconnectedness and low redundancy, high levels of complexity are another key feature of the digital economy. In particular, the digital economy manifests not just a high level of complexity, but in particular a high level of interactive complexity, in which wide-ranging and unpredictable interconnections between different parts of a system are possible. Many of the software programs that are necessary to the web are immensely complex – much too complex for even the most sophisticated programmers in the world to adequately understand. Windows, for example, has over 60 million lines of code (Gisel & Olejnik, 2018).

Pasquale (2015) highlights an important element of contemporary power dynamics in that digital companies implement a two-sided mirror. They seek to know everything about their users, while their users know nothing about how they function. Yet, from a risk perspective there is also the larger point that given this level of complexity of these programs, no one, whether inside the company or outside, can hope to have a comprehensive picture of the interactions between these different lines of code – much less, how this software interacts with the external, social world. Even with the best programmers in the world, the complexity of these software systems regularly creates unanticipated mistakes in coding.10 When this level of complexity intersects with how tightly-coupled many software systems are, the exploitation of a single key vulnerability can lead to the complete breakdown of a computer or network of computers, as occurred with WannaCry and NotPetya. This complexity is so much more problematic in the context of the particularities of cyber-security. That is, it does not matter how many attacks are repelled because a single breach is enough to potentially generate a ‘class break’, in which a number of devices with similar software vulnerabilities can have their confidentiality, availability, or integrity breached (Schneier, 2018).

Yet, despite the continuing failures of cyber-security and the fragility of the system, the current trajectory of the business model of the digital economy, of seeking monopolistic network effects and of collecting as much data as possible, incessantly drives further growth in the size and complexity of the network (Hindman, 2018; Srnicek, 2017; Zuboff, 2019). While this is manifested by many trends, the pivot towards the Internet of Things (IoT) – as associated with projects such as the ‘smart home’ of surveillance capitalism (Zuboff, 2019) and ‘smart cities’ (Kitchin & Dodge, 2019) – exemplifies this in particularly stark terms. The addition of billions of further devices to the internet has not only immensely increased the ‘attack surface’ of interconnected devices on which cyber-security depends; it has also amplified the complexity of potential interactions between internet connected devices (see Schneier, 2018).

The Mirai botnet11 exemplifies well the potential risks of the interactive complexity of the contemporary networked digital economy, as well as some of the particular risks involved in shifting from a modular infrastructure to an interconnected infrastructure that is exposed to weaknesses anywhere across the global digital network. Unlike WannaCry and NotPetya, which involved sophisticated teams of computer hackers, the original source code for Mirai was developed by three 21 year olds in the United States. The botnet in turn was built out of this source code – which the original hackers had released onto the web (as an attempt to hide their identities from the FBI). Other, as of yet unidentified hackers, using the Mirai botnet to take control of IoT devices that had default passwords (security cameras, DVRs, routers (Graff, 2017)) used them to pursue a Distributed Denial of Service (DDoS) against the company Dyn. This attack caused widespread problems across the web because of Dyn’s core infrastructural role in the internet through its role as a Domain Name System (DNS) for other websites. This attack led to large parts of the internet on the Eastern Coast of the United States not working, causing disruptions to Twitter, Amazon, Spotify, PayPal, Reddit and Airbnb amongst others, while also disrupting parts of the internet in the rest of North America and in Europe (Graff, 2017). As a DNS, Dyn helps web browsers translate written addresses into numbered IP addresses and vice versa and thus is a core part of the functionality of the web. At the height of the attack, hackers were able to use over 600,000 infected devices through the Mirai botnet to launch an unprecedented record attack of 1.2 terrabits of network-clogging traffic to Dyn’s servers, which overloaded their servers, thus disrupting their ability to fulfil their normal functions (Graff, 2017).

While the disruption from this attack was felt in the United States and Europe, the insecure, infected devices did not come from these areas. Highlighting the complex interdependencies of the global nature of the internet and how any two devices with an IP address can be directly and instantaneously connected, this was ‘harm at a distance’ at its best, as the infected devices were primarily from Brazil, Columbia and Vietnam, while China, South Korea, Russia, Turkey and India also exhibited significant levels of infection (listed in descending order (Bursztein, 2017)). Contrary to separable complexity, interactive complexity functioned across the system as devices of different types (DVRs versus core infrastructure DNS) and geographical locations (Asia and South American versus the United States and Europe) became intricately interconnected because of a breach of a seemingly distant and disparate part of the system.

#### 3 – Mismatch between knowledge and activity – malfunctions are likely and trigger a global domino effect.

Curran ’20 [Dean; Assistant Professor in Sociology @ University of Calgary, PhD in Sociology; “Connecting risk: Systemic risk from finance to the digital,” *Economy and Society* 49(2), p. 239-264; AS]

Mismatches between scope of knowledge and activity

In addition to high interconnectedness, low redundancy and high interactive complexity, pre-crisis finance also exhibited a significant mismatch between the scope of knowledge and activity. As Tett (2009, p. xiv) argues ‘The modern world is littered with these silos – pockets of specialist knowledge, where technical experts work in mental and structural silos. Indeed, these silos are proliferating, for as the pace of innovation speeds up, and spreads further and further around the globe, our world is becoming more technologically complex by the day’. As such, while Tett (2009, 2015) primarily focuses her critique on increasing silos of knowledge, as her quote suggests we are witnessing an even more dangerous process in which we have a dual process of the production of increasingly complex and interconnected systems, alongside the increasingly narrow, cordoned bases of knowledge and responsibility for those who are cumulatively producing this externalized complexity. This process is clearly on display in the lead-up to the financial crisis.

While, as discussed above, the complexity of interconnections between Mortgage Backed Securities grew the scope of knowledge of its producers did not correspondingly grow – in fact, in many ways it constricted. Rather than carefully investigating the different potential risks, ‘Mortgage lending had become an assembly-line affair in which loans were made and then quickly reassembled into bonds immediately sold to investors’ (Tett, 2009, p. 112). Even when key additional layers of complexity were added through the development of ABS CDOs, there was little additional knowledge or orientation to the additional connections that were being generated. Ultimately, the primary knowledge base and orientation of the producers and sellers of ABS CDOs was how to attain the desired credit rating on these investments – all other portions of complexity were externalized by the vast majority of those formulating these investments. Consequently, once the model of the Gaussian copula was identified as a way to solve the problem of estimating correlations, the complexities were neglected, with the Gaussian copula functioning as the ‘combustion engine of the CDO world’ (Tett 2009, p. 119–122). As MacKenzie’s (2011) discussion of different clusters of evaluation practices likewise shows, those who made and rated the ABS CDOs lacked a sufficient basis of knowledge to fully understand their actual activity – both in terms of the vulnerabilities of the investments they packaged and the vulnerability of the financial system to these extremely complex investment vehicles. As emphasized above, these mismatches between knowledge and activity not only left open the potential for creating extremely risky financial transactions, but also tended to shield those who created and benefitted from the risk from responsibility for the consequences of these risks.

The digital economy likewise manifests extreme mismatches between the scope of knowledge of those developing computing programs and the interdependencies that emerge on top of them. As emphasized above, contemporary computer programs exhibit a level of complexity well beyond the comprehension of a single person or group of people. Alongside this complexity then is a massive mismatch between the extremely small part of an overall program that any one set of programmers develop and understand – which even then can contain flaws in itself (Schneier, 2018) – and the emergent intersections of these units into larger systemic fragilities across the network. As interactive complexities build on top of interconnected and low redundancy systems and intensify the problems emerging from these features, this mismatch between scope of knowledge and activity intensifies these problems of interactive complexity. Moreover, problems of interactive complexity are amplified by how tightly-coupled computing systems can be – massive automated systems can be ~~disabled~~ [harmed] by even a single mistake as computers do not possess the type of hermeneutic interpretability that living agents do (see Kernighan, 2017). Yet, it is not only the physical nature of computing that leads to the potential for a single mistake to cascade through a computing device; the emerging monopolistic business model of the digital economy creates greater interdependencies as large digital companies seek to insert themselves as a universally necessary part of the ‘stack’ of digital computing services (Nunan & Di Domenico, 2017). An illustrative example, the cascading failure of websites in February 2017, exemplifies well how the interconnectedness and complexity of the web interacts with mismatches between the knowledge of specific individuals and the massive ramifications that their actions can have.

In February 2017, several websites on the East Coast of the United States stopped functioning properly, including the websites of Slack, GitHub, GitLab, Quora, Medium, Expedia, Adobe Cloud, with reports of Xero, SiriusXM, and Nest internet-connected devices also ceasing to function properly (Nichols, 2017). In fact, outage monitoring sites DownDetector and isitdownrightnow.com were also not functioning properly due to the overloading of the sites because of a massive spike in internet users checking on the functionality of these other websites (Nichols, 2017). Ultimately, this five-hour breakdown in availability of these websites and services was traced back to the malfunctioning of Amazon Web Services (AWS), a core cloud computing provider. The malfunctioning had occurred due to a single typo by an Amazon employee. The employee was debugging a billing system and ended up taking offline more servers than were intended. This ‘error started a domino effect that took down two other server subsystems and so on … ’ (Del Rey, 2017). AWS had also suffered a significant outage due to human error years earlier in 2011. In upgrading its primary servers, the traffic that the server usually manages was sent to a back-up server rather than being sent to the rest of the network. This back-up server was not intended to handle this much higher level of traffic, thus causing a significant amount of the traffic to get ‘stuck’. Despite this single mistake of redirection to the back-up server, if the system had functioned properly, the problem would not have cascaded in this way, but this mistake interacted with other as of yet previously unidentified bugs, thus amplifying the breakdown in service (Goldman, 2011).

The massive outage in February 2017 is estimated to have damaged the business of 54 of the top 100 internet retailers, with an estimated total economic impact of $150 million (Bort, 2017). This has led to the incident being described as ‘Amazon and the $150 million typo’ (Hersher, 2017). Reflecting on the systemic importance of a single cloud computing company, it was noted that AWS has ‘quietly become responsible for keeping much of the internet running’ and that ‘AWS has come to underpin so much of our daily life that we hardly even notice how important it’s become — until it stops working’ (Swearingen, 2018). Yet, different parts of AWS malfunctioned again in September 2017 and then in March 2018, hitting Alexa, Slack and Capital One. While Amazon apologized and promised changes, the cascading impacts of AWS outages continue to be felt. As with interconnectedness and low redundancy, the growing complexity and mismatch between knowledge and impacts in the digital economy, though shaped by the technology, is not an inevitable dimension of the technology, but rather massively intensified by the monopolistic characteristics of the digital economy and the goal of digital giants to grow as large as quickly as possible (see Hindman, 2018).

#### Cascading collapse escalates global hotspots, including reactor meltdowns – extinction.

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But what exactly is a global system? Our planet itself is an autonomous and selfsustaining mega-system, marked by periodic cycles and elemental vagaries. Human activities within however are not system isolates as our banking, utility, farming, healthcare and retail sectors etc. are increasingly entwined. Risks accrued in one system may cascade into an unforeseen crisis within and/or without (Choo, Smith & McCusker, 2007). Scholars call this phenomenon “emergence”; one where the behaviour of intersecting systems is determined by complex and largely invisible interactions at the substratum (Goldstein, 1999; Holland, 1998).

The ongoing COVID-19 pandemic is a case in point. While experts remain divided over the source and morphology of the virus, the contagion has ramified into a global health crisis and supply chain nightmare. It is also tilting the geopolitical balance. China is the largest exporter of intermediate products, and had generated nearly 20% of global imports in 2015 alone (Cousin, 2020). The pharmaceutical sector is particularly vulnerable. Nearly “85% of medicines in the U.S. strategic national stockpile” sources components from China (Owens, 2020).

An initial run on respiratory masks has now been eclipsed by rowdy queues at supermarkets and the bankruptcy of small businesses. The entire global population – save for major pockets such as Sweden, Belarus, Taiwan and Japan – have been subjected to cyclical lockdowns and quarantines. Never before in history have humans faced such a systemic, borderless calamity.

COVID-19 represents a classic emergent crisis that necessitates real-time response and adaptivity in a real-time world, particularly since the global Just-in-Time (JIT) production and delivery system serves as both an enabler and vector for transboundary risks. From a systems thinking perspective, emerging risk management should therefore address a whole spectrum of activity across the economic, environmental, geopolitical, societal and technological (EEGST) taxonomy. Every emerging threat can be slotted into this taxonomy – a reason why it is used by the World Economic Forum (WEF) for its annual global risk exercises (Maavak, 2019a).

As traditional forces of globalization unravel, security professionals should take cognizance of emerging threats through a systems thinking approach.

METHODOLOGY

An EEGST sectional breakdown was adopted to illustrate a sampling of extreme risks facing the world for the 2020-2030 decade. The transcendental quality of emerging risks, as outlined on Figure 1, below, was primarily informed by the following pillars of systems thinking (Rickards, 2020):

• Diminishing diversity (or increasing homogeneity) of actors in the global system (Boli & Thomas, 1997; Meyer, 2000; Young et al, 2006);

• Interconnections in the global system (Homer-Dixon et al, 2015; Lee & Preston, 2012);

• Interactions of actors, events and components in the global system (Buldyrev et al, 2010; Bashan et al, 2013; Homer-Dixon et al, 2015); and

• Adaptive qualities in particular systems (Bodin & Norberg, 2005; Scheffer et al, 2012)

Since scholastic material on this topic remains somewhat inchoate, this paper buttresses many of its contentions through secondary (i.e. news/institutional) sources.

ECONOMY

According to Professor Stanislaw Drozdz (2018) of the Polish Academy of Sciences, “a global financial crash of a previously unprecedented scale is highly probable” by the mid-2020s. This will lead to a trickle-down meltdown, impacting all areas of human activity.

The economist John Mauldin (2018) similarly warns that the “2020s might be the worst decade in US history” and may lead to a Second Great Depression. Other forecasts are equally alarming. According to the International Institute of Finance, global debt may have surpassed $255 trillion by 2020 (IIF, 2019). Yet another study revealed that global debts and liabilities amounted to a staggering $2.5 quadrillion (Ausman, 2018). The reader should note that these figures were tabulated before the COVID-19 outbreak.

The IMF singles out widening income inequality as the trigger for the next Great Depression (Georgieva, 2020). The wealthiest 1% now own more than twice as much wealth as 6.9 billion people (Coffey et al, 2020) and this chasm is widening with each passing month. COVID-19 had, in fact, boosted global billionaire wealth to an unprecedented $10.2 trillion by July 2020 (UBS-PWC, 2020). Global GDP, worth $88 trillion in 2019, may have contracted by 5.2% in 2020 (World Bank, 2020).

As the Greek historian Plutarch warned in the 1st century AD: “An imbalance between rich and poor is the oldest and most fatal ailment of all republics” (Mauldin, 2014). The stability of a society, as Aristotle argued even earlier, depends on a robust middle element or middle class. At the rate the global middle class is facing catastrophic debt and unemployment levels, widespread social disaffection may morph into outright anarchy (Maavak, 2012; DCDC, 2007).

Economic stressors, in transcendent VUCA fashion, may also induce radical geopolitical realignments. Bullions now carry more weight than NATO’s security guarantees in Eastern Europe. After Poland repatriated 100 tons of gold from the Bank of England in 2019, Slovakia, Serbia and Hungary quickly followed suit.

According to former Slovak Premier Robert Fico, this erosion in regional trust was based on historical precedents – in particular the 1938 Munich Agreement which ceded Czechoslovakia’s Sudetenland to Nazi Germany. As Fico reiterated (Dudik & Tomek, 2019):

“You can hardly trust even the closest allies after the Munich Agreement… I guarantee that if something happens, we won’t see a single gram of this (offshore-held) gold. Let’s do it (repatriation) as quickly as possible.” (Parenthesis added by author).

President Aleksandar Vucic of Serbia (a non-NATO nation) justified his central bank’s gold-repatriation program by hinting at economic headwinds ahead: “We see in which direction the crisis in the world is moving” (Dudik & Tomek, 2019). Indeed, with two global Titanics – the United States and China – set on a collision course with a quadrillions-denominated iceberg in the middle, and a viral outbreak on its tip, the seismic ripples will be felt far, wide and for a considerable period.

A reality check is nonetheless needed here: Can additional bullions realistically circumvallate the economies of 80 million plus peoples in these Eastern European nations, worth a collective $1.8 trillion by purchasing power parity? Gold however is a potent psychological symbol as it represents national sovereignty and economic reassurance in a potentially hyperinflationary world. The portents are clear: The current global economic system will be weakened by rising nationalism and autarkic demands. Much uncertainty remains ahead. Mauldin (2018) proposes the introduction of Old Testament-style debt jubilees to facilitate gradual national recoveries. The World Economic Forum, on the other hand, has long proposed a “Great Reset” by 2030; a socialist utopia where “you’ll own nothing and you’ll be happy” (WEF, 2016).

In the final analysis, COVID-19 is not the root cause of the current global economic turmoil; it is merely an accelerant to a burning house of cards that was left smouldering since the 2008 Great Recession (Maavak, 2020a). We also see how the four main pillars of systems thinking (diversity, interconnectivity, interactivity and “adaptivity”) form the mise en scene in a VUCA decade.

ENVIRONMENTAL

What happens to the environment when our economies implode? Think of a debt-laden workforce at sensitive nuclear and chemical plants, along with a concomitant surge in industrial accidents? Economic stressors, workforce demoralization and rampant profiteering – rather than manmade climate change – arguably pose the biggest threats to the environment. In a WEF report, Buehler et al (2017) made the following pre-COVID-19 observation:

The ILO estimates that the annual cost to the global economy from accidents and work-related diseases alone is a staggering $3 trillion. Moreover, a recent report suggests the world’s 3.2 billion workers are increasingly unwell, with the vast majority facing significant economic insecurity: 77% work in part-time, temporary, “vulnerable” or unpaid jobs.

Shouldn’t this phenomenon be better categorized as a societal or economic risk rather than an environmental one? In line with the systems thinking approach, however, global risks can no longer be boxed into a taxonomical silo. Frazzled workforces may precipitate another Bhopal (1984), Chernobyl (1986), Deepwater Horizon (2010) or Flint water crisis (2014). These disasters were notably not the result of manmade climate change. Neither was the Fukushima nuclear disaster (2011) nor the Indian Ocean tsunami (2004). Indeed, the combustion of a long-overlooked cargo of 2,750 tonnes of ammonium nitrate had nearly levelled the city of Beirut, Lebanon, on Aug 4 2020. The explosion left 204 dead; 7,500 injured; US$15 billion in property damages; and an estimated 300,000 people homeless (Urbina, 2020). The environmental costs have yet to be adequately tabulated.

Environmental disasters are more attributable to Black Swan events, systems breakdowns and corporate greed rather than to mundane human activity.

Our JIT world aggravates the cascading potential of risks (Korowicz, 2012). Production and delivery delays, caused by the COVID-19 outbreak, will eventually require industrial overcompensation. This will further stress senior executives, workers, machines and a variety of computerized systems. The trickle-down effects will likely include substandard products, contaminated food and a general lowering in health and safety standards (Maavak, 2019a). Unpaid or demoralized sanitation workers may also resort to indiscriminate waste dumping. Many cities across the United States (and elsewhere in the world) are no longer recycling wastes due to prohibitive costs in the global corona-economy (Liacko, 2021).

Even in good times, strict protocols on waste disposals were routinely ignored. While Sweden championed the global climate change narrative, its clothing flagship H&M was busy covering up toxic effluences disgorged by vendors along the Citarum River in Java, Indonesia. As a result, countless children among 14 million Indonesians straddling the “world’s most polluted river” began to suffer from dermatitis, intestinal problems, developmental disorders, renal failure, chronic bronchitis and cancer (DW, 2020). It is also in cauldrons like the Citarum River where pathogens may mutate with emergent ramifications.

On an equally alarming note, depressed economic conditions have traditionally provided a waste disposal boon for organized crime elements. Throughout 1980s, the Calabria-based ‘Ndrangheta mafia – in collusion with governments in Europe and North America – began to dump radioactive wastes along the coast of Somalia. Reeling from pollution and revenue loss, Somali fisherman eventually resorted to mass piracy (Knaup, 2008).

The coast of Somalia is now a maritime hotspot, and exemplifies an entwined form of economic-environmental-geopolitical-societal emergence. In a VUCA world, indiscriminate waste dumping can unexpectedly morph into a Black Hawk Down incident. The laws of unintended consequences are governed by actors, interconnections, interactions and adaptations in a system under study – as outlined in the methodology section.

Environmentally-devastating industrial sabotages – whether by disgruntled workers, industrial competitors, ideological maniacs or terrorist groups – cannot be discounted in a VUCA world. Immiserated societies, in stark defiance of climate change diktats, may resort to dirty coal plants and wood stoves for survival. Interlinked ecosystems, particularly water resources, may be hijacked by nationalist sentiments. The environmental fallouts of critical infrastructure (CI) breakdowns loom like a Sword of Damocles over this decade.

GEOPOLITICAL

The primary catalyst behind WWII was the Great Depression. Since history often repeats itself, expect familiar bogeymen to reappear in societies roiling with impoverishment and ideological clefts. Anti-Semitism – a societal risk on its own – may reach alarming proportions in the West (Reuters, 2019), possibly forcing Israel to undertake reprisal operations inside allied nations. If that happens, how will affected nations react? Will security resources be reallocated to protect certain minorities (or the Top 1%) while larger segments of society are exposed to restive forces? Balloon effects like these present a classic VUCA problematic.

Contemporary geopolitical risks include a possible Iran-Israel war; US-China military confrontation over Taiwan or the South China Sea; North Korean proliferation of nuclear and missile technologies; an India-Pakistan nuclear war; an Iranian closure of the Straits of Hormuz; fundamentalist-driven implosion in the Islamic world; or a nuclear confrontation between NATO and Russia. Fears that the Jan 3 2020 assassination of Iranian Maj. Gen. Qasem Soleimani might lead to WWIII were grossly overblown. From a systems perspective, the killing of Soleimani did not fundamentally change the actor-interconnection-interactionadaptivity equation in the Middle East. Soleimani was simply a cog who got replaced.

#### Grid collapse causes extinction.

Weiss ’19 [Matthew and Martin; May 29; National Sales Director at United Medical Instruments, UMI and Research assistant at the American Jewish University; Neurosurgeon at UCLA-Olive View Medical Center; Energy, Sustainability, and Society, “An assessment of threats to the American power grid,” vol. 9]

Consequences of a sustained power outage

The EMP Commission states “Should significant parts of the electrical power infrastructure be lost for any substantial period of time, the Commission believes that the consequences are likely to be catastrophic, and many people will die for the lack of the basic elements necessary to sustain life in dense urban and suburban communities.” [67].

Space constraints preclude discussion on how the loss of the grid would render synthesis and distribution of oil and gas inoperative. Telecommunications would collapse, as would finance and banking. Virtually all technology, infrastructure, and services require electricity.

An EMP attack that collapses the electric power grid will collapse the water infrastructure—the delivery and purification of water and the removal and treatment of wastewater and sewage. Outbreaks that would result from the failure of these systems include cholera. It is problematic if fuel will be available to boil water. Lack of water will cause death in 3 to 4 days [68].

Food production would also collapse. Crops and livestock require water delivered by electronically powered pumps. Tractors, harvesters, and other farm equipment run on petroleum products supplied by an infrastructure (pumps, pipelines) that require electricity. The plants that make fertilizer, insecticides, and feed also require electricity. Gas pumps that fuel the trucks that distribute food require electricity. Food processing requires electricity.

In 1900, nearly 40% of the population lived on farms. That percentage is now less than 2% [69]. It is through technology that 2% of the population can feed the other 98% [68]. The acreage under cultivation today is only 6% more than in 1900, yet productivity has increased 50 fold [69].

As stated by Dr. Lowell L Wood in Congressional testimony:

“If we were no longer able to fuel our agricultural machine in the country, the food production of the country would simply stop, because we do not have the horses and mules that used to tow agricultural gear around in the 1880s and 1890s”. “So the situation would be exceedingly adverse if both electricity and the fuel that electricity moves around the country……… stayed away for a substantial period of time, we would miss the harvest, and we would starve the following winter” [70].

People can live for 1–2 months without food, but after 5 days, they have difficulty thinking and at 2 weeks they are incapacitated [68]. There is typically a 30-day perishable food supply at regional warehouses but most would be destroyed with the loss of refrigeration [69]. The EMP Commission has suggested food be stockpiled for a possible EMP event.

A prescription for failure

Even if all the recommendations of the Congressional EMP Commission were implemented, there is no guarantee that the grid will not sustain a prolonged collapse. There should therefore be contingency plans for such a failure.

There is also another consideration. The foundational pillars of prior American nuclear defense policy, in today’s climate, are of uncertain validity. Mutual assured destruction is the Maginot line of the 21st century. Nonproliferation will prove difficult to resurrect.

The consequences of a widespread nuclear attack have been positioned to the public as massive deaths from blast effects, and then further lingering deaths from the effects of radiation. We suspect there will be no electricity, and there will be no electricity for a very long time.

There should be an actionable plan in anticipation of a possible prolonged collapse of the grid—a retro-structure and a skill set to provide a framework for survival. Our sense is there is no plan.

#### Cyber-attacks go nuclear – extinction.

Orlov ’20 [Vladimir, Founder & Director of the PIR Center, President of the Trialogue Club International, Head of the Center for Global Trends and International Organizations at the Diplomatic Academy, Ministry of Foreign Affairs of the Russian Federation, Co-Founder and Academic Supervisor of the International Dual Degree MA Program in Nonproliferation and Global Security Studies, MGIMO University, Professor at MGIMO University, author (or coauthor) of more than a dozen books and monographs and more than three hundred research papers, articles, and essays, publishes his views in Russian and foreign periodicals, “‘No Holds Barred’ and the New Vulnerability: Are We in for a Re-Run of the Cuban Missile Crisis in Cyberspace?,” SSRN Scholarly Paper, ID 3538078, Social Science Research Network, 02/14/2020, papers.ssrn.com, doi:10.2139/ssrn.3538078]

Not hundred per cent of the dialogue has been frozen, fortunately. Certain informal, mostly offthe-record, meetings of US and Russian experts on cyber agenda continue taking place, both through Track 2 and Track 1.5. One of the most intellectually stimulating meetings, with frank exchanges, took place in Vienna in December 2018. The report produced after the meeting stressed “the significant risk […] that cyber-attacks could conceivably lead to a military escalation that may further trigger a nuclear weapons exchange, a fact that became more explicit with the adoption of the current Nuclear Posture Review. This issue gets complicated given that third parties may have the capabilities to invoke a cyber conflict between Russia and the United States. Whether a country or a non-state actor, they could put the two countries on the verge of an armed conflict by attacking critical infrastructure of either of them and making it look as if the aggressor were the other one”[22]. However, one should have no illusion: such informal meetings may be fully fruitful only when their reports and policy recommendations are utilized by the governments. And for that, a warmer climate in bilateral relations is a must. So far, we see exactly the opposite: mercury falling to freezing levels.

Risk of cyber clashes growing into a chaotic global cyber war has been emphasized by the UN Secretary-General Antonio Guterres in his Agenda for Disarmament: “Malicious acts in cyberspace are contributing to diminishing trust among States… States should implement the recommendations elaborated under the auspices of the General Assembly, which aim at building international confidence and greater responsibility in the use of cyberspace.[23]” However, as the members of the US-Russian Track 1.5 working group on strategic stability recently concluded, “without a constructive dialogue on cyber issues between the United States and Russia, the world would most likely fail to agree on any norms of responsible behavior of states in cyber space”[24].

Do we really have to survive a cyber equivalent of the Cuban Missile Crisis to realize the importance of achieving some kind of agreement on cyber issues, and on the broader agenda of international information security?[25] Or is that kind of talk plain old alarmism?

I don’t want to sound a fatalist, but I am even less keen on sounding like an ostrich that’s buried its head in the sand. We cannot ignore the obvious: whether the world’s most powerful actors like it or not, the world is sliding to another major crisis like the one in 1962. The cyber war is already raging. There are no rules of engagement in that war. The uncertainty is high. The spiral of tension is getting out of control. The cyber arms race is gaining momentum. And there are no guarantees that the next crisis will be controllable, or that it will result in a catharsis as far as international information security regulation is concerned. There’s no telling what will happen once the cyber genie is out of the bottle.

#### Internet collapse causes extinction.

Eagleman ’10 [Dr. David; 11/9/2010; PhD in Neuroscience @ Baylor University, Adjunct Professor of Neoroscience @ Stanford University, Former Guggenheim Fellow, Director of the Center for Science and Law, BA @ Rice University; “Six Ways The Internet Will Save Civilization”; https://www.wired.co.uk/article/apocalypse-no]

Many great civilisations have fallen, leaving nothing but cracked ruins and scattered genetics. Usually this results from: natural disasters, resource depletion, economic meltdown, disease, poor information flow and corruption. But we’re luckier than our predecessors because we command a technology that no one else possessed: a rapid communication network that finds its highest expression in the internet. I propose that there are six ways in which the net has vastly reduced the threat of societal collapse.

Epidemics can be deflected by telepresence

One of our more dire prospects for collapse is an infectious-disease epidemic. Viral and bacterial epidemics precipitated the fall of the Golden Age of Athens, the Roman Empire and most of the empires of the Native Americans. The internet can be our key to survival because the ability to work telepresently can inhibit microbial transmission by reducing human-to-human contact. In the face of an otherwise devastating epidemic, businesses can keep supply chains running with the maximum number of employees working from home. This can reduce host density below the tipping point required for an epidemic. If we are well prepared when an epidemic arrives, we can fluidly shift into a self-quarantined society in which microbes fail due to host scarcity. Whatever the social ills of isolation, they are worse for the microbes than for us.

The internet will predict natural disasters

We are witnessing the downfall of slow central control in the media: news stories are increasingly becoming user-generated nets of up-to-the-minute information. During the recent California wildfires, locals went to the TV stations to learn whether their neighbourhoods were in danger. But the news stations appeared most concerned with the fate of celebrity mansions, so Californians changed their tack: they uploaded geotagged mobile-phone pictures, updated Facebook statuses and tweeted. The balance tipped: the internet carried news about the fire more quickly and accurately than any news station could. In this grass-roots, decentralised scheme, there were embedded reporters on every block, and the news shockwave kept ahead of the fire. This head start could provide the extra hours that save us. If the Pompeiians had had the internet in 79AD, they could have easily marched 10km to safety, well ahead of the pyroclastic flow from Mount Vesuvius. If the Indian Ocean had the Pacific’s networked tsunami-warning system, South-East Asia would look quite different today.

Discoveries are retained and shared

Historically, critical information has required constant rediscovery. Collections of learning -- from the library at Alexandria to the entire Minoan civilisation -- have fallen to the bonfires of invaders or the wrecking ball of natural disaster. Knowledge is hard won but easily lost. And information that survives often does not spread. Consider smallpox inoculation: this was under way in India, China and Africa centuries before it made its way to Europe. By the time the idea reached North America, native civilisations who needed it had already collapsed. The net solved the problem. New discoveries catch on immediately; information spreads widely. In this way, societies can optimally ratchet up, using the latest bricks of knowledge in their fortification against risk.

Tyranny is mitigated

Censorship of ideas was a familiar spectre in the last century, with state-approved news outlets ruling the press, airwaves and copying machines in the USSR, Romania, Cuba, China, Iraq and elsewhere. In many cases, such as Lysenko’s agricultural despotism in the USSR, it directly contributed to the collapse of the nation. Historically, a more successful strategy has been to confront free speech with free speech -- and the internet allows this in a natural way. It democratises the flow of information by offering access to the newspapers of the world, the photographers of every nation, the bloggers of every political stripe. Some posts are full of doctoring and dishonesty whereas others strive for independence and impartiality -- but all are available to us to sift through. Given the attempts by some governments to build firewalls, it’s clear that this benefit of the net requires constant vigilance.

Human capital is vastly increased

Crowdsourcing brings people together to solve problems. Yet far fewer than one per cent of the world’s population is involved. We need expand human capital. Most of the world not have access to the education afforded a small minority. For every Albert Einstein, Yo-Yo Ma or Barack Obama who has educational opportunities, uncountable others do not. This squandering of talent translates into reduced economic output and a smaller pool of problem solvers. The net opens the gates education to anyone with a computer. A motivated teen anywhere on the planet can walk through the world’s knowledge -- from the webs of Wikipedia to the curriculum of MIT’s OpenCourseWare. The new human capital will serve us well when we confront existential threats we’ve never imagined before.

Energy expenditure is reduced

Societal collapse can often be understood in terms of an energy budget: when energy spend outweighs energy return, collapse ensues. This has taken the form of deforestation or soil erosion; currently, the worry involves fossil-fuel depletion. The internet addresses the energy problem with a natural ease. Consider the massive energy savings inherent in the shift from paper to electrons -- as seen in the transition from the post to email. Ecommerce reduces the need to drive long distances to purchase products. Delivery trucks are more eco-friendly than individuals driving around, not least because of tight packaging and optimisation algorithms for driving routes. Of course, there are energy costs to the banks of computers that underpin the internet -- but these costs are less than the wood, coal and oil that would be expended for the same quantity of information flow.

The tangle of events that triggers societal collapse can be complex, and there are several threats the net does not address. But vast, networked communication can be an antidote to several of the most deadly diseases threatening civilisation. The next time your coworker laments internet addiction, the banality of tweeting or the decline of face-to-face conversation, you may want to suggest that the net may just be the technology that saves us.

#### Structural separations maintain system stability by valuing redundancy over efficiency.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098; AS]

Preserving System Resiliency

Another justification that recurs is promoting the resiliency of systems. Because several of the entities subject to structural separations serve an “infrastructural” role—structuring access to markets or to an essential good or service—the public has a strong interest in maintaining their stability and shielding them from disruption.497 Crashes that cripple these infrastructural services can have an outsized effect on economic activity, and involvement in multiple lines of business can increase the likelihood of system crashes. For this reason, policymakers treated strict limits on entry and exit as one way to shield critical services from undue risk.498 Structural separations in banking and telephony, too, were partly justified on grounds of promoting system stability.499

Precisely because banking services constitute a critical good, ensuring the soundness and stability of banking is a central goal of banking policy. Lawmakers and regulators have argued that preventing banks from expanding into commercial activities may help insulate banks from the vagaries of other sectors.500 This line of argument is premised on the idea that exposing banks to manufacturing, physical trading, or other commercial activities “increases the vulnerability of the banking and payments systems, the federal deposit insurance fund, and thereby the broader economy.”501 A question frequently raised during the 2013 debates around banks’ expansion into physical commodity trading was: What would happen if Morgan Stanley repeated the BP oil spill? Would taxpayers be on the line for the $61.2 billion in damages? In this way, a structural separation helps eliminate the risk that instability or disruption in commercial markets could necessitate a financial bailout.502 To be sure, not all commercial activities are inherently more risky than financial activity—and, some might argue, expanding into these spheres may help banks diversify risk. That said, it is true that some commercial activities—like drilling oil or mining—pose particularly expensive risks to which federally insured depository institutions should not be exposed.503

Concerns about system stability and resiliency also informed the FCC’s Computer Inquiries. The carriers argued that, in order to promote efficiency, they should be permitted to use excess capacity for data processing.504 The Commission stated, first, that “the potential abuses inherent” in the system far outweighed any purported efficiencies,505 and, second, the carriers should have a “‘back-up’ system” that “should be designed to meet foreseeable breakdowns of equipment dedicated to public service” and “should be available instantly for that purpose without the conflicting claims of other users.”506 In other words, the FCC privileged redundancy over efficiency, recognizing that the former would serve the public by helping to ensure the stability of communications services and networks. Although expanding into data processing wouldn’t necessarily heighten the risk of a crash, keeping that capacity for backup would enable the system to absorb any shocks, helping promote resiliency.

### 1AC – Extra

#### Trends are unsustainable – ROI will soon equate the cost of capital – the plan ignites a gale of creative destruction to induce drastic, not incremental innovation.

Rizzo ’21 [Andrea Minuto; Head of International Affairs @ Italian Competition Authority; “Digital Mergers: Evidence from the Venture Capital Industry Suggests That Antitrust Intervention Might Be Needed,” *Journal of European Competition Law & Practice* 12(1); AS]

In recent years, a debate about the possible existence of a kill zone around technology incumbents has gone beyond venture capital circles to involve a broader audience.33 In the kill zone, incumbents allegedly have both the ability and the incentive to foreclose promising potential competitors. Their position allows them to collect large amounts of data and to identify emerging trends early and to react to th

em, whether by adopting aggressive exclusionary practices to protect their core market or by pre-emptive acquisitions of innovative start-ups at generous multiples.34 Exclusionary conduct and acquisitions may actually be complementary strategies, rather than substitutive ones, as the former may allow the incumbent to reduce the acquisition price.35

Despite the growing concern that the possible existence of a kill zone might negatively impact innovation, the venture capital industry itself has diverse views about the need to increase antitrust scrutiny against large digital incumbents changing the current approach to M&As. In particular, among the venture capitalists that have actively engaged with US antitrust enforcers36, even those that acknowledge the existence of a problem at the same time express their fears for the possible unintended consequences of changes introduced with the best of intentions.

Tackling incentives to innovate in the digital sector represents a multifaceted phenomenon, where the opposing sides are nevertheless part of the same coin. On one hand, venture capital has so far greatly contributed to the transformation of high-risk start-ups into fully fledged independent companies, participating in the creation of the most valuable public companies globally. Moreover, start-ups benefit in many ways from the ecosystems created by large technology incumbents, among others, by using their platforms as effective distribution channels.

Furthermore, the incumbents might simply offer a better product or service. On the other hand, however, there seems to be evidence, on the investment side, highlighting a possible reduction of venture-backed start-ups operating in the same space where digital incumbents are active. As stated during these debates ‘funds have a limited size and they have to allocate capital and they would much rather pursue a market that has tailwinds behind it as opposed to a market that has matured and that has deep entrenched incumbents’.37 In markets dominated by incumbents, ‘(... ) start-ups building superior products (... ) may also find it difficult to secure VC investment’.38

In addition, some venture capitalists have expressed their views that competition to digital incumbents might likely arise from adjacent markets. A ‘viral’ success in a separate vertical could, as it grows, spill into the core market of a dominant player. These adjacent markets might be an area where antitrust agencies could focus more.

Some of the evidence described in the previous section is consistent with the existence of reduced first-time venture-backed funding in markets dominated by digital incumbents. Despite the evidence still being limited, it nevertheless provides suggestive food for thought and should trigger more detailed research on this complex topic. First of all, the existence and the magnitude of this reduction have to be further verified, for example, through a precise identification of the companies actually competing in the same space of digital incumbents and their evolution. The second step should then verify the existence of a causal link between the alleged aggressive behaviour of the incumbents in the kill zone and the reduction of venture capital financings, especially in the early stages of start-ups.

This reduction might, indeed, not necessarily pertain to the antitrust domain as it could stem from changing requirements of start-ups themselves as their technological and commercial needs evolve. The widespread ‘blitzscaling’ 39 strategy—where start-ups enter a digital niche with a narrow focus then gradually expanding—has been made possible by developments—such as the advent of smartphones, social media and cloud computing40—that allow for global reach and scalability41 at almost no initial technological cost, while marketing and human capital budgets may be on the rise at successive stages of the start-ups’ development.42

Moreover, changes have taken place also in the investment industry landscape through an expansion of the types of capital provided. Among others, non-traditional newer investors and sovereign wealth funds have invested in later-stage companies.43 Lastly, as for the exits through a sale, generous acquisitions might, as well, reflect prospective efficiencies deriving from the synergies between the acquirer and the acquired start-up.

However, the evidence thus far collected does suggest that current digital incumbents face very little threat of entry. Competition for the market dynamics are not necessarily symptomatic of the presence of the exploitation of market power, provided that incumbents still face, actual or potential, competitive pressures and could be substituted by a more efficient rival.44 What is needed is not just incremental innovation, but the drastic innovation that makes market leadership highly contestable. This is especially true for technology markets, where, as stated by Google itself, ‘changes tend to be revolutionary, not evolutionary’.45

Some recent studies and antitrust agency reports suggest that digital markets are becoming progressively less dynamic. Among others, the UK’s Digital Competition Expert Panel (UK Report46) observes that competition for the market does not appear to be able to solve competition issues linked to winner-take-all outcomes, as the next technological revolution is likely to focus on data that existing firms control to a large extent and that successful new entrants are generally acquired by incumbents. Moreover, Organisation for Economic Co-operation and Development (OECD) research suggests that, in digital-intensive sectors, mark-ups are increasingly higher47 while the decline in business dynamism occurs faster than in other sectors of the economy.48

As highlighted by the Stigler report49, key players in the digital industry remained the same over the last two technology waves, staying dominant through the shift to mobile and the rise of artificial intelligence, without significant impact on market share or profit margins.

Lastly, worrying evidence emerges also from the application of profitability analysis to digital incumbents. High profits substantially and persistently above the cost of capital 50 could signal that the market is not functioning properly, as in the long term, return on investment should equal the cost

of capital. In that regard, the UK’s Competition and Markets Authority (CMA) has found, in the context of the sector enquiry into online platforms and digital advertising51, that the return on capital employed (ROCE) of Google and Facebook has been well above any reasonable estimate of a competitive benchmark for many years. In 2018, the estimated cost of capital for both Google and Facebook was around 9%, compared to actual returns on capital of over 40% for Google and around 50% for Facebook. Even though these results have to be interpreted with caution52, they seem to indicate that digital platforms are not facing the threat of entry and this evidence is consistent with the actual exploitation of market power.

Schumpeter 53 highlighted the prospect of new competition and innovation as incessantly playing a key role in fostering dynamic competition and economic efficiency. The evidence so far described may indicate that this impulse for creative destruction is fading in digital market.

# 2AC

## Dynamism

## Dependency Trap

## Systemic Risk

## AT: T

### 2AC – AT: T-Prohibition

#### C/I – Prohibitions don’t have to cease everything – can be categorical or limited.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098]

Notably, state and federal governments have issued line-of-business restrictions through a variety of legal tools: corporate charters, regulatory regimes, and antitrust law.227 In some cases, these limits prohibited firms from expanding into any distinct market; in others, they prohibited firms from entering only adjacent markets—namely, those markets that involve a successive stage of production or distribution. A categorical prohibition would, for example, ban a movie distributor from entering any nondistributor market, whereas a ban on integration would prohibit it from entering only the movie-production market or the movie-theater market. Since this Article examines the dual role that digital platforms play—as both marketplace operators and merchants in the marketplace—this Part primarily focuses on limits on entry into adjacent markets

## AT: Multilat CP

### 2AC – AT: Multilat CP

#### 7. Shreds certainty – it’s perceived as the US letting other nations dictate the scope of its domestic antitrust laws. That produces an uncertain business environment which chills investment and startup innovation. That’s Khan and

Chopra & Khan ’20 [Rohit; Commissioner @ Federal Trade Commission; and Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Case for “Unfair Methods of Competition” Rulemaking,” *The University of Chicago Law Review* *87*(2), p. 357-380; AS]

“Rulemaking” often evokes the idea of government imposing some inflexible prescription upon the marketplace. This is not what we are suggesting. As former Commissioner Elman rightly noted, rulemaking can also be related to “standards, guidelines, pointers, criteria, or presumptions.”41 Rules come from courts, legislative bodies, and agencies. While they were not promulgated as agency rules, certain elements of the merger guidelines eventually came to serve as rules once courts adopted them.42 The merger guidelines stipulate the analytical framework that the agencies rely on to enforce the merger law. Agency rulemaking could do the same for “unfair methods of competition.”

We see three major benefits to the FTC engaging in rulemaking under “unfair methods of competition,” even if the conduct could be condemned under other aspects of antitrust laws. As we describe above, the current approach generates ambiguity, is unduly burdensome, and suffers from a democratic participation deficit. Rulemaking can benefit the marketplace and the public on all of these fronts.

First, rulemaking would enable the Commission to issue clear rules to give market participants sufficient notice about what the law is, helping ensure that enforcement is predictable.43 The APA requires agencies engaging in rulemaking to provide the public with adequate notice of a proposed rule. The notice must include the substance of the rule, the legal authority under which the agency has proposed the rule, and the date the rule will come into effect.44 An agency must publish the final rule in the Federal Register at least thirty days before the rule becomes effective.45

These procedural requirements promote clear rules and provide clear notice. As the Supreme Court has stated, a “fundamental principle in our legal system is that laws which regulate persons or entities must give fair notice of conduct that is forbidden or required.”46 Clear rules also help deliver consistent enforcement and predictable results. Reducing ambiguity about what the law is will enable market participants to channel their resources and behavior more productively and will allow market entrants and entrepreneurs to compete on more of a level playing field.

#### 9. Counterplan causes delay – stifles innovation.

Khan ’19 [Lina; Chairperson @ Federal Trade Commission, JD @ Yale Law School; “The Separations of Platforms and Commerce,” *Columbia Law Review* 119(4), p. 973-1098; AS]

Moreover, even disputes between well-heeled corporations can take years to resolve. For example, in 2011 Bloomberg filed a complaint with the FCC, alleging that Comcast was improperly grouping Bloomberg’s channel in an unfavorable cluster of channels.679 Since the FCC had conditioned Comcast’s acquisition of NBC on the basis of fair “neighborhooding” of independent news networks, Bloomberg claimed that Comcast was in violation of its commitments.680 Granted that this dispute was adjudicated outside the auspices of section 616 and the agency’s ALJ, the FCC took over two years to reach a final decision.681 Given the importance of timeliness in high-tech markets—where a slight delay can render a remedy obsolete—even a two-year process in digital markets will likely come at the expense of innovation.

## AT: States CP

### 2AC – AT: States CP

#### State enforcement over-deters and generates uncertainty – stifles innovation and competition.

Grosso ’21 [Jacob; JD Candidate @ University of Richmond School of Law; “The Preemption of Collective State Antitrust Enforcement in Telecommunications,” *University of Richmond Law Review* 55(2), p. 615-656; AS]

Preemption would address the effects of the growth of federal regulators in the telecommunications market, particularly CFIUS, as well as the resulting changes to the regulatory landscape. If the states act as another national regulator in telecommunications, then innovation, competition, and the ability of federal enforcers to pursue policy goals will be stifled. To solve this problem, collective state antitrust action should be preempted by federal law in the telecommunications market. States likely remain better plaintiffs than consumers in many situations and therefore should litigate on behalf of their citizens. This litigation should be conducted individually, with federal regulatory enforcement generally left to federal regulators.

States should not be prevented from enforcing antitrust law; instead, states should focus exclusively on violations of their own state laws and on protecting their citizens as individual enforcers, not as a collective body. Federal agencies are the proper regulators of national industries such as telecommunications, while state enforcement prevents federal nonenforcement policies which may benefit social welfare overall.253 With respect to policy goals, CFIUS's interventions in recent years showcase the federal government's focus on national security concerns in the telecommunications market. Agendas balancing broader policy goals-such as national security-with competition are only possible under a more centralized enforcement system and by specialized agencies.254

Specialized agencies are therefore the best regulators of the telecommunications market. 25 5 The requirement that "[a]ntitrust analysis must always be attuned to the particular structure and circumstances of the industry at issue" leads to efficiencies from the use of specialized enforcers. 256 The inelasticity of the market and the significant barriers to entry require oversight by specialized expert regulators to maintain a competitive environment, and interference from other government regulators will only impede the ability of the federal regulators to direct this market. Nonenforcement policies, used when the agencies determine doing so is in the best interests of competition, cannot be enforced without a monopoly on enforcement. 257

Placing control in the hands of more centralized regulators reduces uncertainty for competitors due to the inherent inconsistencies in court proceedings and allows for better market functioning. 258 The inability to pursue nonenforcement agendas and reduce litigation will cause unnecessary false positives. False positives can discourage competition and innovation. 25 9 Too many false positives will cause competitors to restrict their behavior drastically to comply with enforcers at the cost of innovative business practices.26 0 Overenforcement and the resulting false positives reduce competition, inviting harm to both the consumer and the aggregate social welfare.26 1 Reduction in states' ability to conduct collective antitrust litigation will naturally decrease the overall amount of litigation, which provides several benefits to competition and to regulators. These benefits include reduced compliance costs, legal fees, and the redistribution of resources. 26 2 Reduced costs will benefit administrative costs, particularly those resulting from the coordination of state agencies. The result is a leaner, specialized enforcement system; increased market freedom due to clear regulations; and the opportunity for regulators to balance broader policy goals with antitrust.

#### States cannot apply global antitrust remedies – they’re key to preventing the dependency trap caused by dominant platform’s conduct in developing countries.

Funta ’18 [Rastislav; PhD, LLM, Associate Professor of European Union Law in Janko Jesenský Faculty of Law @ Danubius University; “Extraterritorial application of us-antitrust law on global cartels from comparative (EU LAW) perspective,” *The Lawyer Quarterly* 8(3); AS]

The first question seemed to be largely clarified. The text of the law is based on the socalled “effects test”, which is based on the decision of the Supreme Court in United States v. Aluminium Co. of America, 148 F.2d 416 (2d Cir. 1945) and subsequently confirmed by the Supreme Court in Hartford Fire Insurance Co. v. California, 509 U.S. 764, 113 S.Ct. 2891, 125 L.Ed.2d 612 (1993). The differences between the various Circuit Courts are focused on the second question: Is it the applicant’s claim in the concrete procedure which is the result of the domestic impact,17 or satisfies such a claim a potential18 or potential19 plaintiffs? The question referred to the Supreme Court has tended to be as whether the plaintiffs can assert claims under the Sherman Act to compensate for damages arising solely from transactions that took place outside the US market. The question focused on the applicability of the Sherman Act to foreign conduct. The Sherman Act is to be considered if such activities have an effect on the US market (effects test). Unlike European law, the US Sherman Act focuses more on foreclosure practices and attempts to market monopolization20 Described according to Senator John Sherman, Chairman of the US Senate Financial Committee, Sherman’s antitrust law of 1890, has to protect against commercial practices designed to restrict or eliminate competition in the market. Sherman’s law is divided into two sections.21 According to them, it is forbidden to monopolize trade, all mergers and collusion, which would restrict competition within trade. The Sherman Act was the first measure adopted by the US Congress to ban trusts (or monopolies of any kind). Although many US states have previously enacted similar laws, they were limited to domestic trade. On the other hand, Sherman’s law was based on Congress’s constitutional power to regulate interstate trade.

#### 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.

## AT: Regulate CP

### 2AC – R&D CP

#### The CP stifles innovation by crowding out industry R&D – peer firms will cut R&D to manage short-term earnings

Ngo & Stanfield ’20 [Phong Ngo is a professor of Finance @ The Australian National University; Jared Stanfield is a professor @ the University of Oklahoma Price College of Business; “Does Government Spending Crowd Out R&D Investment? Evidence from GovernmentDependent Firms and Their Peers”; Journal of Finance and Quantitative Analysis]

Government spending represents a significant portion of the United States’ gross domestic product (GDP), averaging over 37% between 1970–2017 and now accounts for over 50% of GDP growth (Davidson (2018)). While government spending can plausibly impact firms throughout the economy, its effect will be especially pronounced in government suppliers. The U.S. federal government is the single largest customer in the world with annual spending in excess of half a trillion dollars on goods and services. As a result, many firms in the economy are dependent on the government spending as a major source of sales revenue.1 For example, Booz Allen Hamilton Holding Corporations 2018 annual report states that “Our business, prospects, financial condition, or operating results could be materially harmed… by… budgetary constraints, including Congressionally mandated automatic spending cuts, affecting U.S. government spending generally, or specific agencies in particular, and changes in available funding.”

The last half century has also seen total research and development (R&D) spending in the United States grow significantly, currently amounting to approximately $US500 billion per year. While government spending impacts R&D expenditures through the direct federal funding of small, private new ventures (Howell (2017)), it can also indirectly influence private R&D expenditures of large, publicly traded firms. Specifically, since R&D increases with size and sales (e.g. Klette and Griliches (2000)), if higher government spending results in higher earnings for firms dependent on government spending as a major source of revenue, then government spending may also increase private R&D spending through this sales channel.2 In this paper, we analyze the relation between government spending and private R&D expenditures through this channel.

We take a new approach to studying the impact of government spending on private investment by examining the heterogeneous responses in the R&D expenditures of three distinct types of firms to government spending (discussed in detail in Section III and the Supplementary Material). First, we study government-dependent (GD) firms that rely on government spending as a major source of sales revenue, making them particularly sensitive to changes in federal spending. Second, we consider the nondependent industry peers of the GD firms, or those operating in the same industries as GD firms and producing similar products and services, but specialize in providing their products and services to the private sector. These firms may be indirectly impacted by changes in government spending. Finally, we also consider nonpeer firms that operate in industries with no GD firms. We briefly discuss our predictions regarding these groups in the following and in more detail in Section II.

First, we predict that as a result of their higher profitability, GD firms will increase R&D spending in response to government spending increases (e.g., Brown et al. (2009)). Second, we predict that increases in government spending will lead peers of GD firms to decrease R&D investment, whereas nonpeers will remain unaffected. As opposed to traditional hypothesized mechanisms of public spending reducing private investment (see David, Hall, and Toole (2000) for a comprehensive review), we propose a relative-performance channel as a novel mechanism to explain this response that has been previously overlooked. Briefly, relative performance evaluation provides managers with both explicit (i.e., compensation contracts) and implicit (career or reputation concerns) incentives to avoid declines in performance relative to industry peers (e.g., see Gibbons and Murphy (1990), Holmstrom (1979), (1999), and Zwiebel (1995)). Additionally, research shows that firms vary R&D to meet earning targets (e.g., Bushee (1998), Dechow and Sloan (1991)). Therefore, when an increase in government spending results in an increase in GD firm earnings and profitability (and therefore a decrease in the relative performance of peer firms), we expect managers of peer firms to adjust shortterm earnings up by cutting R&D expenditure.3 In contrast, we do not expect nonpeers to respond to changes in government spending because their performance is not benchmarked against GD firms.

Following the recent literature to identify large customers of operating firms (e.g., Dhaliwal, Judd, and Shaikh (2016), Ellis, Fee, and Thomas (2012), Harford, Schonlau, and Stanfield (2019), and Hertzel, Li, Officer, and Rodgers (2008)), we find evidence consistent with our predictions: following increases in government spending, GD firms increase investment in R&D, whereas their industry-peers contract and nonpeers do not significantly respond. Although we observe a positive impact on GD firm investment in R&D, we also find that, on net, government spending reduces (i.e., “crowds out”) industry-level investment in R&D due to the reduction in R&D of the industry peers of GD firms. We also present analysis suggesting these effects have significant differential value impacts on these firms. Therefore, we present evidence consistent with both sides of the existing literature examining the relation between government spending and private R&D.

In a series of tests motivated by the literature, we find evidence consistent with relative performance evaluation acting as the primary mechanism explaining industry-peer contraction.4 Consistent with our prediction, we show that peer firms experience a relative decline in sales but not earnings. We also find that the R&D reductions for industry peers are concentrated in firms where earnings management is most likely: i) firms with CEOs whose pay is most sensitive to industry performance (i.e., stronger relative performance evaluation); ii) firms with CEOs with greater career concerns (i.e., younger CEOs); iii) firms in more competitive industries (Aggarwal and Samwick (1999)); iv) years when government spending increases, rather than declines; and v) in firms belonging to industries with lower unionization (Bova (2013)). In the Supplementary Material, we do not observe a similar reduction in capital expenditures (which does not impact relative earnings); we obtain evidence that peer firms manage earnings through other discretionary expenses (i.e., advertising and selling, general, and administrative expense (SG&A)) in response to variation in government spending; and we find that the likelihood that peer-firms cut R&D increases only if an increase in government spending is also associated with a decline in the relative performance of peers compared to the prior year (Bushee (1998)).

We explore and rule out several plausible alternative explanations for the negative response of peer-firms (and the positive response of GD firms) to variation in government spending in Section IV.D. Specifically, we do not find that macrolevel considerations (i.e., price/interest rate/tax channel and the counter-cyclicality of government spending), competitive effects or peers responding to a negative shock (i.e., losing government contract bids), a displacement of funding in the presence of positive technology spillovers, political uncertainty, or political contributions are driving our results. We conclude that “crowding out,” in our context, is not driven by these effects, but rather by the incentives of industry-peer managers to match the earnings of GD firms.

We also take several steps to mitigate the potential endogeneity of government spending to private investment. First, we study the value effects of unexpected budget-shocks on GD firms and their peers by utilizing key dates related to the U.S. government’s credit rating downgrade and the Budget Control Act in 2011. We estimate that the cumulative abnormal return to GD firms is between 1.7% and 3.6% across these events, consistent with budget shocks causally impacting GD firms. Furthermore, these events impacted the value of peers that are more likely to manage earnings positively. Together, these tests suggest government spending significantly (and causally) impacts GD and peer firm value. Second, we introduce a variable representing split control in Congress to identify exogenous changes in government spending. Split control of Congress can influence the speed, direction, and magnitude of changes in spending but is plausibly exogenous to differential private investment by government-dependent firms and satisfies a variety of weak instrument tests (discussed in detail in Section V.B and the Supplementary Material). Taken together, these results document evidence that our findings are not driven by the endogeneity of government spending.

Finally, we perform a series of robustness tests to mitigate concerns regarding the comparability of our groups of firms (GD, peers, and nonpeers) and the potential endogeneity of firms choosing to be GD (i.e., “selection” effects) as discussed in Section V.C. Specifically, we perform our analysis using propensity-matched samples, we compare the effects of corporate vs. government customers, we study whether changes in government spending predict government dependence, and we perform our analysis in a subsample of firms that have ever listed the government as an important customer. In all of these tests, we do not find evidence that our results are driven by the selection of firms into government-dependence.

Our paper is related to the literature addressing the question of whether government spending crowds out private R&D investment. The extant literature documents mixed findings, some document significant positive spillovers to private R&D (e.g., Howell (2017), Levy and Terleckyj (1983), and Link (1982)), whereas others report the crowding out of private investment on the average firm or industry (e.g., Carmichael (1981), Wallsten (2000), and Cohen, Coval, and Malloy (2011)).

We document the heterogenous effects of government-spending impacts on firm R&D investment by examining the impact of fiscal policy on three types of firms (GD, peer, and nonpeer firms) and contribute to this literature by showing that in addition to the direct funding effect of small, private new ventures documented by Howell (2017), government spending can indirectly increase the R&D of GD firms through a sales/earnings channel. However, we also document that government spending reduces R&D spending in GD industries due to reductions in R&D spending by peers of GD firms consistent with papers such as Cohen et al. (2011). Finally, we offer a novel, and previously undocumented, mechanism through which government spending can deter private R&D and crowd out industry level investment: peer firms cut R&D expenses to manage short-term earnings when faced with a decline in relative earnings. We therefore provide the first evidence for the role of R&D’s impact on earnings, combined with industrial relative performance evaluation and managerial incentives in understanding the mechanisms behind fiscal crowding out.5 We also contribute to the literature on relative performance evaluation (discussed in Section II) by providing some of the first evidence that relative performance evaluation alters managerial behavior.

## AT: Innovation DA

### 2AC – AT: Innovation DA

#### Innovation low now – VC investment in startups are declining and startup formation is at a thirty-year low. that’s Khan and

Kersten ’21 [Alexander; 4/14/21; Director of the Renewing American Innovation Project @ Center for Strategic and International Studies; Master of Arts in Law and Diplomacy from the Fletcher School of Law and Diplomacy @ Tufts University; “Why Renewing American Innovation? The “Endless Frontier Act” and Biden’s Bid for Maintaining U.S. Global Competitiveness”; https://www.csis.org/analysis/why-renewing-american-innovation-endless-frontier-act-and-bidens-bid-maintaining-us-global; AS]

The China Challenge

China today poses both a technological and security threat to the United States that no country has in modern history. U.S. companies operating under free market rules struggle to compete against state-backed Chinese firms that can ignore a poor quarter while enjoying one of the largest, most-protected markets in the world. With the support of the central government, key Chinese firms are free to innovate and compete in the global market without financial worries while Chinese scientists can focus on research and development instead of seeking grants for their university or research institution. According to Tulane University professor and former Aspen Institute CEO Walter Isaacson in 2019, China has modeled its approach along the lines of U.S. scientist Vannevar Bush’s 1945 report Science: The Endless Frontier, which, besides being the inspiration behind the name of the proposed legislative package, promoted government funding of basic research together with universities and industry—a priority of the Franklin D. Roosevelt administration. As the Chinese government sets long-term strategic goals like Made in China 2025, which was part of China’s 13th Five-Year Plan of 2016-2020, the United States needs to return to its post-World War II values of equating leadership in science and technology with national security and prosperity.

Today, U.S. companies locked in close competition lack the incentives to maintain in-house capabilities for innovation, like they did in the mid-century era of AT&T’s Bell Labs, DuPont’s central R&D unit, Xerox PARC, and others. Heightened competition, shareholder pressures, and new incentives pushed firms to cut these in-house research units back in the 1980s. Since then, the share of applied research in total corporate R&D expenditures fell from 30 percent in 1985 to below 20 percent in 2015—all well below the peak of almost 40 percent in the 1950s. Of course, the Harvard Business Review in 2014 famously suggested that, despite being the source of great inventions throughout history, China today is a “land of rule-bound rote learners” where breakthroughs are rare. Because of this, some argue the Chinese are not great innovators and China’s state-backed system could itself breed complacency and come back to bite it in the near future. However, even by then, experts warn, the United States will have missed the train on many important technologies and will be struggling to catch up.

Despite Silicon Valley and the millennial generation’s supposed penchant for innovative disruption, U.S. total factor productivity has been slowing since the 1970s. Productivity today is the lowest in more than a century. Innovation, historically a clear driver of U.S. productivity, means the creation of ideas and inventions that are translated into practical value and improve the quality of people’s lives directly or via their ability to grow the economy. Whether measured in terms of triadic patents (patents filed in the United States, Europe, and Japan), most available measures of productivity, or even startup company creation, the United States’ trademark innovative spirit has been gradually dampening for decades. And if not for China’s meteoric rise this century, the United States might still be sleepwalking—optimistically but without a serious plan—instead of waking up to the need for a coherent national strategy.

U.S. Complacency, and How We Got There

Noted George Mason University economist Tyler Cowen and other experts have recognized a growing “complacency” in American life as the indicator of a societal shift from the United States’ early dynamism. From the turn of the twentieth century until roughly the moon landing of 1969, the breakneck pace of groundbreaking technologies that directly affected the quality of life and the structure of U.S. society was simply astounding. Yet, since the first moon landing in 1969, only the internet and its application to more and more parts of our lives can claim to have made any meaningful impact—meaning that physically the world of 1969 is much more like that of 2021 than 1969 was of the early twentieth century. This, of course, is not meant to discredit the great advances in medicine and human genomics made in the last few decades, for example, but to show how the rate of society-changing innovations has not maintained the pace that existed from the mid-nineteenth century until roughly 1969.

In the developed world, this slowdown has unfortunately contributed to wage stagnation, the shrinking of the middle class, and greater political polarization domestically. Coinciding with the waning days of the Soviet Union’s power in the 1980s, the U.S. innovation decline was masked at home. Further, the Soviets of that period no longer posed a technological threat to the United States. Japan on the other hand, posed a great technological threat in the 1980s but was and is a staunch U.S. ally, and not a security threat. Unchallenged abroad and riding the dual-edged optimism of the internet boom of the 1990s and the victory over communism, the United States missed the ways in which it was giving up the advantages that made it such a powerhouse in the mid-twentieth century.

Industry experts have also suggested that the United States put its position up for grabs when it began to outsource important production—which President Biden alluded to during the signing of a February 2021 executive order aimed at reducing supply chain bottlenecks. Starting in the 1970s and 1980s, the United States began to outsource production of semiconductors and displays mostly to Taiwan and South Korea, which today account for almost half of all semiconductor manufacturing capacity in the world. Further, adding in mainland China and Japan shows that a whopping three-quarters of all semiconductor manufacturing capacity comes from East Asia—a sharp departure from 1990, when the United States still provided about 50 percent of all global manufacturing capacity. Removing itself from the production process means the United States misses out on important chances for innovating as well as for developing a strong high-tech manufacturing workforce.

#### Competition is better for national champions – best data.

Cavenaile et al. ’21 [Laurent; Department of Management @ University of Toronto Scarborough; Murat Alp Celik; Department of Economics @ University of Toronto; and Xu Tian; Department of Finance @ University of Georgia; “The Dynamic Effects of Antitrust Policy on Growth and Welfare,” *Journal of Monetary Economics* 121, p. 42-59; AS | GCD]

Next, we consider innovation by superstar firms. The decline in the frequency of single firm industries results in higher dynamic competition across superstar firms. When faced with peer competitors with similar productivities, superstars increase their innovation intensity as the escape-competition effect dominates the Schumpeterian creative destruction effect of lower profits. This is particularly true for industries with two superstars. Consequently, we observe a 0.75% increase in superstar innovation with lower HHI thresholds, and a 1.44% increase with a higher obstruction rate.

Combining the dynamic effects of innovation by small firms and superstars, as well as the synergy gains from successful mergers, we calculate that the growth rate of aggregate output increases by 3.54% of its value in the first experiment, and 4.03% in the second experiment. In addition, the increased growth in both experiments is the result of rather modest increases in the aggregate R&D expenditure share at 0.55% and 1.77% of its value. Combined with the more modest increases in allocative efficiency discussed earlier, stronger antitrust enforcement achieved through lowering HHI thresholds is calculated to increase social welfare by 1.98% in consumption-equivalent terms in the long run, whereas the gain is even larger at 2.29% with the more targeted higher obstruction rate experiment. Given the very limited impact on overall M&A activity, these results showcase that higher antitrust enforcement achieved through both methods could yield disproportionately large gains in welfare, since the dynamic effects on superstar innovation (through more intense dynamic competition in innovation among peer superstar firms) is found to be quite substantial despite the low rate of obstruction (4.87% among all merger transactions between superstar firms).

#### Plan results in better innovation:

#### Small firms key – distinct tech, incumbency pressure, and diverse approaches.

Federico ’20 [Giulio et al; European Commission; Fiona Scott Morton; Yale University and NBER; and Carl Shapiro; University of California, Berkeley, and NBER; “Antitrust and innovation: Welcoming and protecting disruption,” *Innovation Policy and the Economy* 20(1), p. 125-190; AS | GCD]

I. Introduction

We write in praise of market disrupters—firms that shake up the status quo, threaten incumbent firms, and sometimes transform entire industries. Through this process, which Joseph Schumpeter famously called “creative destruction,” disruptive firms promote economic growth and bring the benefits of new technologies and new business practices and business models to consumers.

We focus on the impact of antitrust policy—known globally as competition policy—on innovation.1 Competition policy seeks to protect and promote a vigorous competitive process by which new ideas are transformed into realized consumer benefits. In this fundamental way, competition spurs innovation. The productivity and growth literature teach us that innovation is the primary driver of rising standards of living over time, so promoting innovation through effective competition policy is likely to be very consequential for economic growth and welfare.

Disruptive firms drive a significant amount of innovation.2 They do not use the same technology or business model as incumbents. They offer consumers a distinct value proposition, not simply lower prices. By making its offer to customers attractive in a new way, a disruptive firm can destroy a great deal of incumbent profit while creating a large amount of consumer surplus. The resulting churn in products and market shares, as new products enter and old ones exit, and as newer business methods and business models supplant older ones, represents a healthy competitive process. If that competitive process is slowed or biased by mergers or by exclusionary conduct, innovation is lessened and consumers are harmed. This same competitive process promotes the development and diffusion of best practices, including what might be termed reductions in X-inefficiency. The trade and productivity literature both convincingly demonstrate that firms vary significantly in their productivity levels and that stiffer competition reallocates sales to more productive firms. The diffusion of best practices also is promoted if sales are contestable, going to the better-performing firms.

Competition policy seeks to protect the competitive process by which disruptive firms challenge the status quo. Competition policy is agnostic regarding the type of firm or the type of innovation involved. Start-ups that grow rapidly can certainly be disruptive. Uber and Airbnb are prominent recent examples. But large established firms can also be disruptive, especially when they attack adjacent markets. Think of Walmart entering local retail markets, Microsoft Bing challenging Google in search, or Netflix producing its own video content.

In contrast, the role played by successful incumbent firms in their own core markets is deeply conflicted. On the one hand, process innovations that lower costs can be most valuable at the largest firms, and market leaders often invest substantial sums to introduce new generations of products. Examples abound: Intel developing a new generation of technology and building new fabs to manufacture microprocessors; Boeing developing a new generation of large commercial aircraft; and Verizon investing to build its 5G wireless network. In many industries experiencing rapid technological change, the biggest firms are also some of the most impressive innovators, as Schumpeter observed 75 years ago.3 This should not be surprising, given the economies of scale associated with R&D, especially in industries where developing the next-generation product or process requires investments of hundreds of millions of dollars and/or extensive experience with the current technology.4 On the other hand, a successful incumbent firm that is profiting greatly from the status quo has a powerful incentive to preserve those profits, and this can mean slowing down or blocking disruptive threats. Successful incumbents also may find it very difficult organizationally to invest in disruptive technologies.5 Competition valuably increases the diversity of approaches taken to the development of new technology.

We stress in this article that innovation is best promoted when market leaders are allowed to exploit their competitive advantages while also facing pressure to perform coming from both conventional rivals and from disruptive entrants. These labels depend on context: the same firm can be a market leader in one area and a disruptive upstart in another. Market leaders may face competitive pressures to innovate coming from (a) other large firms in the same market, (b) other large firms in adjacent spaces, or (c) smaller, pesky disruptive firms. Casual empiricism indicates that all of these sources of competition are important in different settings. All have historically been protected using competition policy.

The central theme animating our analysis is that a market leader is best motivated to innovate if it fears losing its leadership position to a disruptive rival.6 Even a dominant incumbent will feel pressure to innovate if the bulk of tomorrow’s sales will be won by the firm that is most innovative, be that the incumbent or a disruptive challenger, and if other firms are in a position to leapfrog the current incumbent. Once one properly understands the dynamic nature of the competitive process, it becomes clear that greater rivalry—meaning greater contestability of tomorrow’s sales—leads to more innovation.7 The critical role of competition policy is thus to prevent today’s market leaders from using their market power to disable disruptive threats, either by acquiring wouldbe rivals or by using anticompetitive tactics to exclude them.

#### Killer acquisitions – they wreck innovation.

Lemley and Creary ’21 [Mark and Andrew; Professor of Law @ Stanford and JD MBA Candidate @ Stanford; “EXIT STRATEGY”; 101 B.U. L. REV. 1 (2021)]

III. THE PROBLEM WITH EXIT STRATEGIES

Should it trouble us that the nature of today's startup and VC industries drives startups to sell to incumbent monopolists? In this Part, we argue that the answer is yes.

A. What's Wrong with Incumbents Acquiring Startups?

There are several reasons to be concerned that startups tend to be acquired by incumbents rather than go public or merge with another maverick and that VCs intensify this phenomenon.

First, concentration in the tech industry is a large and growing problem. Others have recognized as much. 273 The normal waves of Schumpeterian competition that disciplined previous network markets seem to have stalled; the companies that dominate the digital economy are all more than fifteen years old and have dominated their market categories for more than a decade. 274 While monopoly alone is not illegal or necessarily problematic, today's tech monopolists have almost certainly held onto and even broadened their monopolies by acquiring firms that in another era would have displaced them. At the very least, these acquisitions have reduced the likelihood of disruptive innovation that would challenge the power of those monopolies. Monopoly can lead to higher prices, though that has not been true for most of today's tech giants. But it can also lead to less consumer-friendly nonprice terms, such as reduced privacy, increased advertising exposure, and less consumer choice and this appears to be happening today.275

Second, incumbent acquisition has contributed to the increasing concentration of technological capacity. Technology is diffusing from leaders to followers more slowly than it used to. Economists have blamed this for a long-term drop in productivity in recent decades and for sustained declines in entrepreneurship over the last decade. 276 Even if today's tech monopolists are good for consumers-and they may be in many ways-the consolidation of technological leadership and resulting loss of technology diffusion is bad for economic growth more generally.

Third, and perhaps most problematic, tech giants often buy up promising startups only to shut them down. Sometimes this is intentional. Economists have documented cases of "killer acquisitions"-companies that buy incipient competitors in order to eliminate the threat they pose. 277 While especially prominent in biotech, the practice is also prominent among big tech firms: Facebook, Google, and Oracle have all bought and shut down competing firms, sometimes in the same day.278 Tim Wu calls this the "Kronos effect"-killing your competitors in their infancy. 279 At other times, firms engage in "acquihires"-buying a startup to get the brainpower it employs, not the products or ideas the startup offers. 280 (Both outcomes often come together: as one tech journalist put it, "[a]nother day, another acqui-hired shutdown." 281 ) But even incumbents that buy startups in good faith often shut them down within a few years. While companies fail all the time, incumbent mergers seem littered with failures. Facebook alone has shut down dozens of once-promising projects after it acquired them, and Google has done the same. 282 Those are not just technologies that no longer compete with the monopolist; they are technologies that we no longer have access to at all because of the exit strategy.

Finally, some might worry about market concentration for its own sake. As New Brandeis scholars remind us, economic concentration often leads to political concentration. 283 And today, tech firms spend more than others to lobby local, state, and federal governments. 284 They and their controlling founders also shape the news that reaches consumers and citizens, corporate executives, and public officials.285 And even supposing their leadership is unimpeachably civic, their structural concentration makes their platforms easier or at least more valuable targets for state and nonstate actors to exploit through disinformation, surveillance, and other campaigns meant to undermine social and political processes. 286 Today's dominant tech platforms aren't solely to blame for political divisions,287 and the lack of alternative exit strategies for VC-backed firms aren't solely to blame for these platforms-but we're not optimistic that current incentives make better alternatives likely to come about. Society tends to benefit when companies compete with incumbents, not cave to them. Not all of these effects apply to all acquisitions. Startups acquired by incumbents fall into three basic categories: companies that compete directly, companies that offer complementary products, and companies that might change the nature of the market altogether. Purposeful killer acquisitions seem most likely of direct competitors and perhaps of companies that threaten the business model altogether. Acquisitions of complements, by contrast, may be more socially beneficial, a prospect we explore in the next Section. Even complementary mergers, however, raise concerns. While an incumbent is unlikely to buy a complement in order to shut it down, complementary acquisitions still increase the size and political power of the incumbent. They may also make eventual direct challenges less likely by expanding the footprint of the incumbent across related markets, making the job of building a competitor that much more complicated.

## AT: Politics DA

### 2AC – AT: Infra/Budget

#### Infra/Budget fails- biden PC not enough to bridge the gap

Lowry 9-27-21

(Rich, https://www.bakersfield.com/opinion/rich-lowry-for-biden-failure-is-very-much-an-option/article\_2cc523e6-1d76-11ec-a542-9f15f6969107.html)

Joe Biden's domestic agenda at the moment is, like his presidency, in peril. It is caught between the Scylla of progressives insisting the bipartisan infrastructure bill can't pass the House before the reconciliation bill passes the Senate and the Charybdis of moderates insisting the bipartisan infrastructure bill must pass the House before anything else happens. It is, to switch metaphors, an old-fashioned Mexican standoff, with the intervention that will lead to all factions holstering their weapons not yet evident. Still, the conventional wisdom is that Democrats will get both bills in the end. They will stare into the abyss, recognize the partywide debacle that would ensue if they pass nothing, and agree, somehow or other, on the infrastructure bill and a reduced reconciliation bill. It's certainly true that, whatever the intervening drama, must-pass spending bills always pass. But the possibility of a complete meltdown shouldn't be underestimated. The reconciliation bill isn't too big to fail, but big enough potentially to fail spectacularly. It has the hallmarks of other signature presidential initiatives that, despite huge investments of presidential political capital, have gone down at the hands of a president's own party. In an unimaginable defeat at the time, Bill Clinton couldn't get his health care bill through Congress, despite a roughly 80-seat House majority and 56 or 57 senators. After his reelection in 2004, George W. Bush's Social Security reform fizzled in a GOP Congress. Out of the gate, Donald Trump suffered an embarrassing defeat on Obamacare repeal in 2017. So, no, victory isn't inevitable, no matter how much Biden needs his bills. It is a well-established axiom that delay, which especially characterized the Clinton health care debate, is a killer. Presidents don't tend to get more popular after an election, and if a delay pushes a fight into a midterm-election year, members of his own party are likelier to conclude they need to go their own way to protect their interests. This is why Sen. Joe Manchin's talk of putting off consideration of the reconciliation bill until 2022 is itself an existential threat to its prospects. It's always a warning sign when a specific, partywide electoral mandate hasn't been built for an agenda. Clinton didn't set out in any detail his ambitions on health care during the 1992 campaign. Bush hardly campaigned on Social Security reform. And Trump had no idea about what would replace Obamacare. Biden did lay out his agenda last year, but he never made it front and center in the campaign. Instead, he presented himself as the anti-Trump who would bring the country together. Obviously, the size of congressional majorities matters. Clinton and Bush couldn't work their will despite healthy numbers, whereas Trump had a very slender majority in the Senate, opening the way for John McCain's famous thumbs down. Biden technically doesn't even have a Senate majority. This gets to what sets him apart from all of his predecessors — the massive disconnect between the scale of the legislation he seeks and the narrow majorities that are supposed to pass it. There's a hunt for villains among progressive commentators as the Biden agenda encounters turbulence. But why wouldn't a president who has an approval rating in the mid-40s, a tie in the Senate and a single-digit majority in the House have difficulties passing the most sweepingly ambitious progressive agenda in decades? The Democratic factions are empowered to make their conflicting demands because the margins are so small. The bill is so huge — with everything stuffed in it to avoid the filibuster — also because the margins are so small. Given the real risks of failure, it would make sense for Democrats to pass the infrastructure bill and pocket that success, then move on to reconciliation, realizing one way or the other that it is going to be slimmed down. Yet that's not the Democrats' mood right now, even though history says that they should be afraid, very afraid.

#### Afghanistan Thumps

Silverman 9-26-21

(Stan, https://www.bizjournals.com/philadelphia/news/2021/09/26/stan-silverman-leadership-lesson-trump-biden.html)

In the days after the fall of Afghanistan, the Biden administration was forced to work with the Taliban, a bitter enemy for 20 years, to ensure Americans could leave the country. The optics of this effort cost Biden significant political capital.

#### Plan popular.

Lande & Vaheesan ’20 [Robert; Professor of Law @ University of Baltimore School of Law and Sandeep; Legal Director @ Open Markets Institute, JD @ Duke; “Preventing the Curse of Bigness Through Conglomerate Merger Legislation,” *Ariz. St. LJ* 52; AS]

B. Growing Political and Public Concern About Corporate Power

Public recognition of, and concern about, corporate political power is growing. An increasing number of politicians and public figures are focused on the political and social—as well as economic—power of large businesses. This concern is not limited to one portion of the political spectrum. A diverse set of voices and organizations are calling for tackling monopoly and oligopoly power in American society.

Prominent liberal and progressive voices have demanded action to curb the economic and political power of large corporations. Many Democrats have made strengthening anti-merger and anti-monopoly law a key pillar of their agenda.80 As mentioned in the introduction, Senator Amy Klobuchar introduced an anti-merger bill that would establish a presumption of illegality involving mergers that combined more than $5 billion in assets.81 This bill would target corporate size directly, although it features a large exemption for pure conglomerate mergers.82

Senator Bernie Sanders weighed in against the AT&T/Time Warner merger and identified the further agglomeration of power as a principal evil of the combination. 83 He stated this consolidation “represents a gross concentration of power that runs counter to the public good.”84 And in early October 2018, Sanders introduced a bill that would break up the largest financial institutions in the United States and establish a cap on size going forward.85 Senator Sanders also promised to combat the excesses of large firms in the agricultural sector, stating that they are devastating to the small farmer and are a direct cause of mass unemployment, lower wages, massive wealth inequality, and a host of social problems. 86 In his October 2019 Corporate Accountability and Democracy plan, presidential candidate Sanders condemned the present system in which “a small group of ultrawealthy CEOs are making the decisions that increasingly determine our economic, environmental and political future.”87

Senator Elizabeth Warren has offered extensive critiques of corporate power, citing undue political influence as one of the evils of corporate bigness.88 In a keynote address at a conference hosted by the Open Markets Institute in December 2017, Senator Warren warned that “[c]oncentrated market power also translates into concentrated political power—the kind of power that can capture our government. And that’s exactly what’s happening, as President Trump and the Republicans in Congress bow to the power and influence of these industrial giants and financial titans.”89 Warren promised that if elected president, she would break up Amazon, Facebook, and Google.90 She published a detailed plan to break up big tech companies, including the creation of a threshold of $25 billion in annual revenue, above which companies would be subject to restrictions and regulations including mandatory divestitures of certain portions of the company. 91 Facebook allegedly removed Warren’s political ads posted on Facebook that called for breaking up Facebook.92

Warren also called for breaking up some of the biggest farming corporations “so that they not only do not have that kind of economic power, so that they’re wiping out competition, so they’re taking all the profits for themselves . . . but also so that they don’t have that kind of political power.”93

These figures are not outliers but are representative of a growing antimonopoly philosophy among Democrats, liberals, and progressives. Others have echoed the concerns expressed by Senators Klobuchar, Sanders, and Warren. (Former) Representative (and current Minnesota Attorney General) Keith Ellison and sitting Representative Ro Khanna established an Antitrust Caucus and called for antitrust enforcers to look beyond just consumer welfare. 94 Alexandria Ocasio-Cortez, the Democratic representative for New York’s 14th Congressional district, has repeatedly voiced concerns about the political might of large financial institutions.95 Senator Cory Booker has lamented the “incredible concentration of economic and political power in this country” 96 and introduced a bill that would establish a moratorium on corporate mergers in agriculture. 97 Former Colorado governor and former presidential candidate John Hickenlooper has called for a major revival in antimonopoly enforcement.98

Indeed, many Democrats have criticized the political power of banks since at least the 2007–08 financial crisis. In early 2009, just six months after the collapse of Lehman Brothers and the start of the worst financial crisis in eighty years, Senator Richard Durbin famously observed that “the banks— hard to believe in a time when we’re facing a banking crisis that many of the banks created—are still the most powerful lobby on Capitol Hill. And they frankly own the place.”99

Among academics and commentators, Joseph Stiglitz and Paul Krugman have repeatedly sounded the alarm about the pervasive market power problem. Stiglitz has opined that “America has a monopoly problem—and it’s huge” and cited the political power of large corporations as subverting democracy. 100 Krugman has similarly recognized the corrosive political power of large corporations. 101 Former Secretary of Labor, Harvard professor, and political commentator Robert Reich applauded Elizabeth Warren’s announced intention to break up big tech and predicted that breaking them up would allow for more privacy, decentralization of information, and more innovation. 102 Barry Lynn, director of the Open Markets Institute think tank, has sounded the alarm that tech giants like Google and Facebook are a threat to core democratic institutions.103 Zephyr Teachout, a progressive law professor, promised that if elected Attorney General of New York she would explore breaking up Google and Facebook using New York state antitrust laws.104

Conservatives in the United States are generally supportive of, and deferential toward, big business interests. Conservative thinkers have indeed played a major role in weakening the antitrust laws and allowing consolidation and monopolization across the economy.105 In the name of “free markets,” conservative politicians and commentators typically favor policies that support large corporations and place few restrictions on them.106

Nonetheless, more and more conservative voices are starting to raise concerns about corporate power. At present, many of the attacks reflect anger at certain companies, more than corporate power in general. Much of the conservative criticism appears driven by the perceived politics of their executives and employees more than a distrust of large corporations and their power in general. For example, Google is viewed as supportive of the Democratic Party and some liberal causes and it has drawn significant criticism from the right. 107 Whatever the underlying motivation though, skepticism of large corporations, or at least a subset of them, is a growing strand of thought on the right.

At least on the surface, the Trump administration reflects this rising antimonopoly tendency among conservatives. President Trump has repeatedly attacked certain powerful corporations.108 He has criticized the power of Amazon and its founder and chief executive officer, Jeff Bezos. 109 He has also condemned vertical integration in telecommunications—specifically calling out the completed merger between Comcast and NBC Universal and the now-completed merger between AT&T and Time Warner—for threatening to “destroy democracy.”110 His former chief strategist and right-wing icon, Steve Bannon, called for public utility regulation of tech platforms like Facebook and Google.111 Former Attorney General Jeff Sessions called for remedying the perceived liberal bias of these same tech platforms.112

Others on the right have sounded similar fears about corporate power. Senator Ted Cruz, who has been a major recipient of campaign contributions from large corporations,113 has endorsed using the antitrust laws against the power of tech platforms. 114 Senator (and former Representative) Marsha Blackburn has criticized platforms like Google and YouTube for failing to practice viewpoint neutrality and called them out for apparent bias against individuals and organizations expressing conservative opinions. 115 Representative Jim Jordan (R-OH) expressed similar concerns and insinuated that stronger governmental measures should be applied to curb the power of giant social media companies.116 Senator Josh Hawley (R-MO) previously served as Missouri’s attorney general and, during his tenure, opened an antitrust investigation into Google.117

Some conservative media outlets have in recent years been vocal critics of corporate power. Breitbart, the hard-right news outlet formerly run by Steve Bannon, has championed antitrust enforcement against large corporations.118 The American Conservative, a nativist right outlet that supports economic populism, has become a consistent critic of corporate power and supporter of renewed antitrust enforcement.119 Tucker Carlson, a commentator on Fox News, has endorsed public checks on Facebook and Google.120

Conservative talk radio icon Rush Limbaugh described what he saw as a pernicious aspect to corporate ownership of media.121 He stated that large, non-media corporations or their CEOs, for example Jeff Bezos purchasing The Washington Post, acquire media to shape policy and thereby increase their power. 122 Even anti-government conspiracy theorist Alex Jones has called on the Trump administration to break up big technology companies because the supposedly left-leaning Silicon Valley titans are using their massive power to stifle conservative viewpoints.123

With rising awareness of, and opposition to, corporate power, an antimerger law that directly targeted corporate size could attract significant popular and political support. Senator Klobuchar’s bill has already introduced size-based limits on consolidation into the political debate.124 Many liberals and progressives appear ready to embrace this idea.125 On the right, support for such a possibility is much less certain.126 Yet, a growing tide of criticism from conservative figures suggests at least one faction on the right may be open to preventing corporate growth through extremely large mergers and acquisitions.127

#### Winners win – legislative blitz key to success

Waldman 20

(Paul, <https://www.washingtonpost.com/opinions/2020/12/02/joe-biden-has-move-fast/>, 12-2)

For every day of his presidency, Joe Biden will be restrained and bedeviled by Republican power. Republicans will probably retain control of the Senate, and even if they don’t, they will do everything they can to sabotage Biden’s agenda. They will obstruct and delay, whether it’s on legislation, appointments or anything else, to make sure Biden has as little as possible to show for his time in office. Unfortunately, Biden is naturally inclined to respond in just the way Republicans are counting on. He’s a compromiser, a dealmaker — a man who wants to believe that there are bipartisan solutions to be found. That’s not to say that Biden is naive about what he faces, just that he will always be vulnerable to some of the same mistakes that President Barack Obama made early in his tenure, mistakes that come from thinking Republicans just might be operating in good faith and with the proper persuasion they can be dealt with. But a realization of the full implications of our current polarization may just prove liberating for the new administration. There are at least some encouraging signs that Biden understands the situation; here’s a report from Politico on how his transition is thinking about personnel: Concerned about Republicans slow-walking confirmation hearings for Cabinet appointees and hollowed-out federal agencies, Biden and his aides are eager to place mid- to lower-level officials across the federal government, particularly in national security roles, to ensure his administration can begin to enact his agenda immediately, according to three people familiar with the situation. Slow-walking will absolutely be the Republican strategy, on both appointments and legislation. They won’t come out and say they’re going to stonewall every appointee and refuse to allow any legislation to pass; instead they’ll say that they just want to make sure Biden doesn’t stock his administration with radical leftists and propose far-out socialist laws. Send us the nominees and the bills, and we’ll consider them. It’ll just take some time. Weeks will then stretch into months, and the Biden agenda will languish. They’ve done it before — Obama himself describes how they endlessly dragged out negotiations on the Affordable Care Act by claiming they might support it — and they’ll do it again. That’s the Republican plan. The first step to getting around it is to understand that the public won’t blame gridlock on the ones who are causing it. They’ll just see a bunch of bickering in Washington with nothing getting done, and Biden will be the one who takes the blame. Once you realize that the public is neither aware of nor particularly concerned about process questions, you can stop worrying about whether Republicans will squawk at this appointment or that executive order — because they’ll squawk no matter what you do. If it’s a good idea and you think the results will be good, then just do it. As quickly and comprehensively as possible. As David Roberts of Vox observes: In 2009, Obama and his aides made the mistake of thinking that their major initiatives had to be rolled out one at a time in sequence, because he had a finite store of “political capital” that had to be spent carefully. But political capital is not something that exists apart from any particular issue; it isn’t a special sauce that has to be poured on a policy in order to make it palatable. And with the parties as polarized and unified as they are, political capital has become all but meaningless. There may have been a time when a popular president possessed so much capital that a senator from the opposition party would feel compelled to support him on part of that president’s agenda, but that time is long gone. There is no account Biden can draw on to turn Republican “no” votes into “yes.” So setting up a series of high-profile policy battles may be the opposite of what Biden should do. The unfortunate fact is that he may not have the opportunity to do much in the way of big legislation on health care or climate change or anything else, and if he has only executive power to work with, it makes it all the more urgent to move quickly. Which means getting staff in place immediately and then unleashing them. The Revolving Door Project argues that Biden should give as much authority as possible to the agencies to let them dismantle their particular corners of the Trump legacy on their own, because the task “simply will not happen if approached sequentially or micromanaged” by a White House staff with limited bandwidth. That means moving on every policy area all at once. There’s nothing to be gained by putting off any part of Biden’s agenda. Whatever he can do given the limits of his power, he should do as soon as possible, in a flood of policymaking. Even if Democrats win both Georgia races and control the Senate, Biden should acknowledge that he likely has two years until the 2022 midterm elections to pass whatever legislation he can. Not only will Democrats probably lose one or both houses in the inevitable backlash (as happens to most presidents in their first midterm), the only possible chance at forestalling that result is to get results, as many as possible, that he can show the voters. Republicans will complain that Biden is being partisan, uncompromising, taking a “my way or the highway” approach. It will be a strategy to convince everyone of the lie that Biden and Democrats might be able to find some way of winning them over, when in fact they’ll be implementing a strategy of total opposition. If Biden follows them on that fruitless quest, he’ll be running in circles while crucial time passes and nothing gets done. The only option for him is to decide not to care about Republican whining and do what he got elected to do with all haste. The alternative is failure.

#### Even extreme warming won’t cause extinction

Dr. Toby Ord 20, Senior Research Fellow in Philosophy at Oxford University, DPhil in Philosophy from the University of Oxford, The Precipice: Existential Risk and the Future of Humanity, Hachette Books, Kindle Edition, p. 110-112

But the purpose of this chapter is finding and assessing threats that pose a direct existential risk to humanity. Even at such extreme levels of warming, it is difficult to see exactly how climate change could do so. Major effects of climate change include reduced agricultural yields, sea level rises, water scarcity, increased tropical diseases, ocean acidification and the collapse of the Gulf Stream. While extremely important when assessing the overall risks of climate change, none of these threaten extinction or irrevocable collapse.

Crops are very sensitive to reductions in temperature (due to frosts), but less sensitive to increases. By all appearances we would still have food to support civilization.85 Even if sea levels rose hundreds of meters (over centuries), most of the Earth’s land area would remain. Similarly, while some areas might conceivably become uninhabitable due to water scarcity, other areas will have increased rainfall. More areas may become susceptible to tropical diseases, but we need only look to the tropics to see civilization flourish despite this. The main effect of a collapse of the system of Atlantic Ocean currents that includes the Gulf Stream is a 2°C cooling of Europe—something that poses no permanent threat to global civilization.

From an existential risk perspective, a more serious concern is that the high temperatures (and the rapidity of their change) might cause a large loss of biodiversity and subsequent ecosystem collapse. While the pathway is not entirely clear, a large enough collapse of ecosystems across the globe could perhaps threaten human extinction. The idea that climate change could cause widespread extinctions has some good theoretical support.86 Yet the evidence is mixed. For when we look at many of the past cases of extremely high global temperatures or extremely rapid warming we don’t see a corresponding loss of biodiversity.87

[FOOTNOTE]

We don’t see such biodiversity loss in the 12°C warmer climate of the early Eocene, nor the rapid global change of the PETM, nor in rapid regional changes of climate. Willis et al. (2010) state: “We argue that although the underlying mechanisms responsible for these past changes in climate were very different (i.e. natural processes rather than anthropogenic), the rates and magnitude of climate change are similar to those predicted for the future and therefore potentially relevant to understanding future biotic response. What emerges from these past records is evidence for rapid community turnover, migrations, development of novel ecosystems and thresholds from one stable ecosystem state to another, but there is very little evidence for broad-scale extinctions due to a warming world.” There are similar conclusions in Botkin et al. (2007), Dawson et al. (2011), Hof et al. (2011) and Willis & MacDonald (2011). The best evidence of warming causing extinction may be from the end-Permian mass extinction, which may have been associated with large-scale warming (see note 91 to this chapter).

[END FOOTNOTE]

So the most important known effect of climate change from the perspective of direct existential risk is probably the most obvious: heat stress. We need an environment cooler than our body temperature to be able to rid ourselves of waste heat and stay alive. More precisely, we need to be able to lose heat by sweating, which depends on the humidity as well as the temperature.

A landmark paper by Steven Sherwood and Matthew Huber showed that with sufficient warming there would be parts of the world whose temperature and humidity combine to exceed the level where humans could survive without air conditioning.88 With 12°C of warming, a very large land area—where more than half of all people currently live and where much of our food is grown—would exceed this level at some point during a typical year. Sherwood and Huber suggest that such areas would be uninhabitable. This may not quite be true (particularly if air conditioning is possible during the hottest months), but their habitability is at least in question.

However, substantial regions would also remain below this threshold. Even with an extreme 20°C of warming there would be many coastal areas (and some elevated regions) that would have no days above the temperature/humidity threshold.89 So there would remain large areas in which humanity and civilization could continue. A world with 20°C of warming would be an unparalleled human and environmental tragedy, forcing mass migration and perhaps starvation too. This is reason enough to do our utmost to prevent anything like that from ever happening. However, our present task is identifying existential risks to humanity and it is hard to see how any realistic level of heat stress could pose such a risk. So the runaway and moist greenhouse effects remain the only known mechanisms through which climate change could directly cause our extinction or irrevocable collapse.

This doesn’t rule out unknown mechanisms. We are considering large changes to the Earth that may even be unprecedented in size or speed. It wouldn’t be astonishing if that directly led to our permanent ruin. The best argument against such unknown mechanisms is probably that the PETM did not lead to a mass extinction, despite temperatures rapidly rising about 5°C, to reach a level 14°C above pre-industrial temperatures.90 But this is tempered by the imprecision of paleoclimate data, the sparsity of the fossil record, the smaller size of mammals at the time (making them more heat-tolerant), and a reluctance to rely on a single example. Most importantly, anthropogenic warming could be over a hundred times faster than warming during the PETM, and rapid warming has been suggested as a contributing factor in the end-Permian mass extinction, in which 96 percent of species went extinct.91 In the end, we can say little more than that direct existential risk from climate change appears very small, but cannot yet be ruled out.

# 1AR

## Innovation DA

### 1AR – UQ – Innovation Low

#### Tech edge eroding across domains – try or die for startups.

Darby & Sewall ’21 [Christopher; CEO @ In-Q-Tel; and Sarah; DPhil @ Oxford, Former Professor @ Harvard's Kennedy School of Government Executive Vice President for Policy @ In-Q-Tel, Former US Undersecretary of State for Civilian Security, Democracy, and Human Rights; “The Innovation Wars: America's Eroding Technological Advantage,” *Foreign Affairs* 100(2), p. 142-153; AS]

Since the early days of the Cold War, the United States has led the world in technology. Over the course of the so-called American century, the country conquered space, spearheaded the Internet, and brought the world the iPhone. In recent years, however, China has undertaken an impressive effort to claim the mantle of technological leadership, investing hundreds of billions of dollars in robotics, artificial intelligence, microelectronics, green energy, and much more. Washington has tended to view Beijing ’ s massive technology investments primarily in military terms, but defense capabilities are merely one aspect of great-power competition today—little more than table stakes. Beijing is playing a more sophisticated game, using technological innovation as a way of advancing its goals without having to resort to war. Chinese companies are selling 5G wireless infrastructure around the world, harnessing synthetic biology to bolster food supplies, and racing to build smaller and faster microchips, all in a bid to grow China’s power.

In the face of China ’ s technological drive, U.S. policymakers have called for greater government action to protect the United States ’ lead. Much of the conventional wisdom is sensible: boost R & D spending, ease visa restrictions and develop more domestic talent, and build new partnerships with industry at home and with friends and allies abroad. But the real problem for the United States is much deeper: a flawed understanding of which technologies matter and of how to foster their development. As national security assumes new dimensions and great-power competition moves into different domains, the government’ s thinking and policies have not kept pace. Nor is the private sector on its own likely to meet every technological need that bears on the country ’ s security.

In such an environment, Washington needs to broaden its horizons and support a wider range of technologies. It needs to back not only those technologies that have obvious military applications, such as hypersonic flight, quantum computing, and artificial intelligence, but also those traditionally thought of as civilian in nature, such as microelectronics and biotechnology. Washington also needs to help vital nonmilitary technologies make the transition to commercial success, stepping in with financing where the private sector will not.

AMERICA’S INNOVATION CHALLENGE

In the early decades of the Cold War, the United States spent billions of dollars dramatically expanding its scientific infrastructure.The Atomic Energy Commission, formed in 1946, assumed responsibility for the wartime labs that had pioneered nuclear weapons, such as the Oak Ridge National Laboratory, the headquarters of the Manhattan Project, and went on to fund academic research centers, such as the Lawrence Livermore National Laboratory.The Department of Defense, founded in 1947, was given its own massive research budget, as was the National Science Foundation, established in 1950. After the Soviets launched the Sputnik satellite, in 1957,Washington created the National Aeronautics and Space Administration, or NASA, to win the space race, as well as what would become the Defense Advanced Research Projects Agency, which was tasked with preventing a future technological surprise. By 1964, research and development accounted for 17 percent of all discretionary federal spending.

Partnering closely with academia and companies, the government funded a large variety of basic research—that is, research without a specific end use in mind.The goal was to build a technological foundation, defined primarily as conventional and nuclear defense capabilities, to ensure the country ’ s security.The research proved astonishingly successful. Government investment spawned cutting-edge capabilities that undergirded the United States ’ military superiority, from supersonic jets to nuclear-powered submarines to guided missiles.The private sector, for its part, got to capitalize on the underlying intellectual property, turning capabilities into products and products into companies. GPS-enabled technologies, airbags, lithium batteries, touchscreens, voice recognition—all got their start thanks to government investment.

Yet over time, the government lost its lead in innovation. In 1964, the U.S. government was spending 1.86 percent of GDP on R & D, but by 1994, that share had fallen to 0.83 percent. During that same period, U.S. corporate R & D investment as a percentage of GDP nearly doubled. The numbers tell only half the story. Whereas much of the government’ s R & D investment was aimed at finding new, game-changing discoveries, corporate R & D was mostly devoted to incremental innovation. The formula for growing revenue, the private sector realized, was to expand on existing products, adding functionality or making something faster, smaller, or more energy efficient. Companies focused on nearer-term technologies with commercial promise, rather than broad areas of inquiry that might take decades to bear fruit.

Increasingly, the most innovative R & D was taking place not in the labs of large corporations but at nimbler, privately funded startups, where venture capital investors were willing to tolerate more risk. Modern venture capital firms—partnerships that invest in early-stage companies—first arose in the 1970s, leading to early successes such as Apple and Microsoft, but it wasn’t until the dot-com bubble of the 1990s that this style of investment really took off. If the first phase of R & D outsourcing was from government labs to corporate America, this was the second phase: away from big businesses and toward small startups. Large companies began to spend less on internal R & D and more on what they called “ corporate development, ” or acquiring smaller, venture-backed companies with promising technologies.

The rise of venture capitalism created a great deal of wealth, but it didn’t necessarily further U.S. interests. Venture capital firms were judged by their ability to generate outsize returns within a ten-year window. That made them less interested in things such as microelectronics, a capital-intensive sector where profitability arrives in decades more so than years, and more interested in software companies, which need less capital to get going.The problem is that the companies receiving the most venture capital funding have been less likely to pursue national security priorities. When the American venture capital firm Accel hit the jackpot by investing early in Rovio Entertainment, the Finnish video game company behind the mobile app Angry Birds, it may have been a triumph for the firm, but in no way did it further U.S. interests.

Meanwhile, government funding of research continued its decline relative both to GDP and to R & D spending in the private sector. The Department of Defense retained the single biggest pot of federal research funding, but there was less money overall, and it became more dispersed across various agencies and departments, each pursuing its own priorities in the absence of a national strategy. As the best researchers were lured to the private sector, the government’ s in-house scientific expertise atrophied. Once close relationships between private companies and Washington also suffered, as the federal government was no longer a major customer for many of the most innovative firms. U.S. agencies were rarely the first to buy advanced technology, and smaller startups generally lacked the lobbyists and lawyers needed to sell it to them anyway.

Globalization also drove a wedge between corporations and the government. The American market came to look less dominant in an international context, with the huge Chinese consumer market exerting a particularly powerful pull. Corporations now had to think of how their actions might look to customers outside the United States. Apple, for example, famously refused to unlock iPhones for the FBI, a decision that probably enhanced its brand internationally.

Further complicating matters, innovation itself was upending the traditional understanding of national security technology. More and more, technology was becoming “dual use, ” meaning that both the civilian and the military sectors relied on it. That created new vulnerabilities, such as concerns about the security of microelectronic supply chains and telecommunications networks. Yet even though civilian technologies were increasingly relevant for national security, the U.S. government wasn’t responsible for them. The private sector was, and it was innovating at a rapid clip with which the government could barely keep pace. Taken together, all these trends have led to a concerning state of affairs: the interests of the private sector and the government are further apart than ever.

THE CHINESE JUGGERNAUT

The changes in American innovation would matter less if the world had remained unipolar. Instead, they occurred alongside the rise of a geopolitical rival. Over the past two decades, China has evolved from a country that largely steals and imitates technology to one that now also improves and even pioneers it. This is no accident; it is the result of the state’s deliberate, long-term focus. China has invested massively in R & D, with its share of global technology spending growing from under five percent in 2000 to over 23 percent in 2020. If current trends continue, China is expected to overtake the United States in such spending by 2025.

Central to China’s drive has been a strategy of “military-civil fusion,” a coordinated effort to ensure cooperation between the private sector and the defense industry. At the national, provincial, and local levels, the state backs the efforts of military organizations, state-owned enterprises, and private companies and entrepreneurs. Support might come in the form of research grants, shared data, government-backed loans, or training programs. It might even be as simple as the provision of land or office space; the government is creating whole new cities dedicated solely to innovation.

China’s investment in 5G technology shows how the process works in practice. Equipment for 5G makes up the backbone of a country’s cellular network infrastructure, and the Chinese company Huawei has emerged as a world leader in engineering and selling it—offering high-quality products at a lower price than its Finnish and South Korean competitors. The company has been buoyed by massive state support—by The Wall Street Journal’ s count, some $75 billion in tax breaks, grants, loans, and discounts on land. Huawei has also benefited from China’s Belt and Road Initiative, which provides generous loans to countries and Chinese companies to finance infrastructure construction.

Massive state investments in artificial intelligence have also paid off. Chinese researchers now publish more scientific papers in that field than American ones do. Part of this success is the result of funding, but something else plays a big role: access to enormous amounts of data. Beijing has fueled the rise of powerhouse companies that sweep up endless information about their users. These include Alibaba, an e-commerce giant; Tencent, which developed the all-purpose WeChat app; Baidu, which began as a search engine but now offers a range of online products; DJI, which dominates the consumer drone market; and SenseTime, which provides facial recognition technology for China’s video surveillance network and is said to be the world’s most valuable artificial intelligence company. As a matter of law, these companies are required to cooperate with the state for intelligence purposes, a broad mandate that is almost certainly used to force companies to share data for many other reasons.

That information increasingly involves people living outside China. Chinese companies have woven a global web of data-gathering apps that collect foreigners’ private information about their finances, their search history, their location, and more. Those who make a mobile payment through a Chinese app, for example, could have their personal data routed through Shanghai and added to China’s growing trove of knowledge about foreign nationals. Such information no doubt makes it easier for the Chinese government to track, say, an indebted Western bureaucrat who could be convinced to spy for Beijing or a Tibetan activist who has taken refuge abroad.

China’s hunger for data extends to some of the most personal information imaginable: our own DNA. Since the COVID-19 pandemic began, BGI— a Chinese genome-sequencing company that began as a government funded research group—has broken ground on some 50 new laboratories abroad designed to help governments test for the virus. China has legitimate reasons to build these labs, but it also has an ugly record of forcibly collecting DNA data from Tibetans and Uighurs as part of its efforts to monitor these minorities. Given that BGI runs China ’ s national library of genomics data, it is conceivable that through BGI testing, foreigners ’ biological data might end up in that repository.

Indeed, China has shown great interest in biotechnology, even if it has yet to catch up to the United States. Combined with massive computing power and artificial intelligence, innovations in biotechnology could help solve some of humanity ’ s most vexing challenges, from disease and famine to energy production and climate change. Researchers have mastered the gene-editing tool CRISPR, allowing them to grow wheat that resists disease, and have managed to encode video in the DNA of bacteria, raising the possibility of a new, cost-effective method of data storage. Specialists in synthetic biology have invented a new way of producing nylon—with genetically engineered microorganisms instead of petrochemicals.The economic implications of the coming biotechnology revolution are staggering: the McKinsey Global Institute has estimated the value of biotechnology ’ s many potential applications at up to $4 trillion over the next ten to 20 years.

Like all powerful technologies, however, biotechnology has a dark side. It is not inconceivable, for example, that some malicious actor could create a biological weapon that targeted a specific ethnic group. On controversial questions—such as how much manipulation of the human genome is acceptable—countries will accept different degrees of risk in the name of progress and take different ethical positions.The country that leads biotechnology ’ s development will be the one that most profoundly shapes the norms and standards around its use. And there is reason to worry if that country is China.In 2018, the Chinese scientist He Jiankui genetically engineered the DNA of twin babies, prompting an international uproar. Beijing portrayed him as a rogue researcher and punished him. Yet the Chinese government’ s disdain for human rights, coupled with its quest for technological supremacy, suggests that it could embrace a lax, even dangerous approach to bioethics.

THINKING BIGGER

Washington has monitored China’s technological progress through a military lens, worrying about how it contributes to Chinese defense capabilities. But the challenge is much broader. China’s push for technological supremacy is not simply aimed at gaining a battlefield advantage; Beijing is changing the battlefield itself. Although commercial technologies such as 5G, artificial intelligence, quantum computing, and biotechnology will undoubtedly have military applications, China envisions a world of great-power competition in which no shots need to be fired. Technological supremacy promises the ability to dominate the civilian infrastructure on which others depend, providing enormous influence. That is a major motivation behind Beijing’s support for high-tech civilian infrastructure exports. The countries buying Chinese systems may think they are merely receiving electric grids, health-care technology, or online payment systems, but in reality, they may also be placing critical national infrastructure and citizens ’ data in Beijing ’ s hands. Such exports are China’s Trojan horse.

Despite the changing nature of geopolitical competition, the United States still tends to equate security with traditional defense capabilities. Consider microelectronics. They are critical components not only for a range of commercial products but also for virtually every major defense system, from aircraft to warships. Because they will power advances in artificial intelligence, they will also shape the United States ’future economic competitiveness. Yet investment in microelectronics has fallen through the cracks. Neither the private sector nor the government is adequately funding innovation—the former due to the large capital requirements and long time horizons involved and the latter because it has focused more on securing current supplies than on innovating. Although China has had a hard time catching up to the United States in this area, it is only a matter of time before it moves up the microelectronics value chain.

#### incentive to innovate.

Nate Nead 21, CEO & Managing Member of Nead, LLC, "Is Technological Progress Slowing Down?" Read Write, 02/01/2021, https://readwrite.com/2021/02/01/is-technological-progress-slowing-down/.

There’s a compelling case to be made that while technological progress is still moving forward, it’s slowing down. And if that’s true, we need to be prepared for the consequences of such a shift in momentum.

The Low-Hanging Fruit

Our first clue that tech innovation is slowing down is a change to the traditional model of tech development. In many ways, technology is all about solving problems; every new tech advancement is a solution for some long-standing issue. It makes sense that our current wave of tech advancement resembles an exponential curve because new technologies make it faster and easier to solve other, often unrelated problems.

For example, the development of the internet was revolutionary for technological development overall. People now can review massive databases of information, communicate with other like-minded professionals, share ideas, and even publish their ideas to a broader audience. These capabilities have led to new ideas and new technologies that otherwise could never have been possible.

But this trajectory is limited. In the course of tech development, we often explore new territory very quickly – but only for a limited period of time. Think of it this way. As early human beings began exploring new territory, they found themselves surrounded by an abundance of game animals, trees, and fish. But as they hunted, harvested lumber, and fished, many of those resources began to dry up. In other words, they’d taken all the low-hanging fruit, and were forced to come up with new ideas. They had to explore new territory, invent new agricultural methods, and even find new sources of nourishment.

Our current burst of technological progress could be almost exclusively focused on low-hanging fruit. We’re solving the easiest problems first, and we’re solving them in quick succession. But the hard problems – like general intelligence-level AI, efficient battery storage, and even finding a cure for cancer – show little progress even over the course of decades.

Any futurist will tell you that all of humanity’s problems can be solved eventually. But we have to understand that our pace of innovation tends to slow down as we master all the “easy” problems and start looking at the “hard” ones.

Digital Innovation vs. Chemical Innovation

We also need to understand that most of the tech progress we’ve seen in the past 30 or 40 years has been limited to the digital world. These technologies have been astounding, accelerated by novel high-growth startups, but they’ve almost been exclusively focused on digital communication efficiency. The internet, software engineering, and AI have all taken amazing strides forward. But on the level of chemistry and physics, we’ve advanced very little.

We’re still incredibly reliant on non-renewable resources to fuel our consumption. We haven’t discovered any groundbreaking new elements, molecules, or chemical processes. And our understanding of the universe at the base level of physics hasn’t changed much, if at all, since the 1980s. We’re still struggling to reconcile major physics ideas that were first introduced nearly 100 years ago.

So what? Digital innovation may be so incredibly fast-paced that it can be the conduit through which we solve all other problems, right?

That may not be the case. For the majority of the digital age, we’ve depended on the momentum of Moore’s law. Moore’s law is an informal observation that the number of transistors that we can fit on a dense integrated circuit tends to double every two years. In other words, our computing power can double every two years, leading to major breakthroughs in a number of different technologies.

However, it appears that the age of Moore’s law may be nearing its end. There’s an absolute physical limit to the amount of space on a transistor chip. With exponential growth since the 1960s, we’ve gone from integrated circuits with 10 transistors to ICs with something like 10 billion transistors. How much further can we really go without breaking the laws of physics?

We may be able to push things even further, but to do so, we’ll need to invest in high-end chipmaking equipment and innovate entirely new manufacturing methods. Doing so will sharply increase the cost of chip production, ultimately negating the cost-effectiveness benefits.

Of course, there’s a solid counterargument here. It holds that digital innovation may continue at the same rate of exponential growth even if we’re unable to maintain the consistency of Moore’s law; even if the number of transistors on a chip remains more or less stagnant, we can find new ways to use the chips we already have.

Consumer Products and Perceptions

We see an endless conveyor belt of new gadgets and new consumer-facing technologies emerging on a constant basis. But how innovative are all these products, really?

Apple introduced the iPhone, a game-changing new type of technology, back in 2007. It combined several existing technologies into one, comprehensive unit, and changed the way we think about mobile tech forever. In the past 14 years, how much innovation have we truly seen in this space? We’ve seen a flock of competitors coming out with smartphone options of their own. And of course, we’ve seen Apple unveil a new model of iPhone nearly every year.

But these new, “innovative” smartphones only make marginal improvements to the original formula. Their cameras are sharper. Their processing power is beefier. Their storage capacity and battery life are more robust. But they can hardly be considered new technology, at least not at the same groundbreaking level of their predecessor.

#### Reject anecdotal evidence---empirics.

Jason Crawford 21, Tech startup savant, "Technological stagnation: Why I came around," Roots of Progress, 01/23/2021, https://rootsofprogress.org/technological-stagnation.

“We wanted flying cars, instead we got 140 characters,” says Peter Thiel’s Founders Fund, expressing a sort of jaded disappointment with technological progress. (The fact that the 140 characters have become 280, a 100% increase, does not seem to have impressed him.)

Thiel, along with economists such as Tyler Cowen (The Great Stagnation) and Robert Gordon (The Rise and Fall of American Growth), promotes a “stagnation hypothesis”: that there has been a significant slowdown in scientific, technological, and economic progress in recent decades—say, for a round number, since about 1970, or the last ~50 years.

When I first heard the stagnation hypothesis, I was skeptical. The arguments weren’t convincing to me. But as I studied the history of progress (and looked at the numbers), I slowly came around, and now I’m fairly convinced. So convinced, in fact, that I now seem to be more pessimistic about ending stagnation than some of its original proponents.

In this essay I’ll try to capture both why I was originally skeptical, and also why I changed my mind. If you have heard some of the same arguments that I did, and are skeptical for the same reasons, maybe my framing of the issue will help.

Stagnation is relative

To get one misconception out of the way first: “stagnation” does not mean zero progress. No one is claiming that. There wasn’t zero progress even before the Industrial Revolution (or the civilizations of Europe and Asia would have looked no different in 1700 than they did in the days of nomadic hunter-gatherers, tens of thousands of years ago).

Stagnation just means slower progress. And not even slower than that pre-industrial era, but slower than, roughly, the late 1800s to mid-1900s, when growth rates are said to have peaked.

Because of this, we can’t resolve the issue by pointing to isolated advances. The microwave, the air conditioner, the electronic pacemaker, a new cancer drug—these are great, but they don’t disprove stagnation.

Stagnation is relative, and so to evaluate the hypothesis we must find some way to compare magnitudes. This is difficult.

Only 140 characters?

“We wanted flying cars, instead we got a supercomputer in everyone’s pocket and a global communications network to connect everyone on the planet to each other and to the whole of the world’s knowledge, art, philosophy and culture.” When you put it that way, it doesn’t sound so bad.

Indeed, the digital revolution has been absolutely amazing. It’s up there with electricity, the internal combustion engine, or mass manufacturing: one of the great, fundamental, transformative technologies of the industrial age. (Although admittedly it’s hard to see the effect of computers in the productivity statistics, and I don’t know why.)

But we don’t need to downplay the magnitude of the digital revolution to see stagnation; conversely, proving its importance will not defeat the stagnation hypothesis. Again, stagnation is relative, and we must find some way to compare the current period to those that came before.

Argumentum ad living room

Eric Weinstein proposes a test: “Go into a room and subtract off all of the screens. How do you know you’re not in 1973, but for issues of design?”

This too I found unconvincing. It felt like a weak thought experiment that relied too much on intuition, revealing one’s own priors more than anything else. And why should we necessarily expect progress to be visible directly from the home or office? Maybe it is happening in specialized environments that the layman wouldn’t have much intuition about: in the factory, the power plant, the agricultural field, the hospital, the oil rig, the cargo ship, the research lab.

No progress except for all the progress

There’s also that sleight of hand: “subtract the screens”. A starker form of this argument is: “except for computers and the Internet, our economy has been relatively stagnant.” Well, sure: if you carve out all the progress, what remains is stagnation.

Would we even expect progress to be evenly distributed across all domains? Any one technology follows an S-curve: a slow start, followed by rapid expansion, then a leveling off in maturity. It’s not a sign of stagnation that after the world became electrified, electrical power technology wasn’t a high-growth area like it had been in the early 1900s. That’s not how progress works. Instead, we are constantly turning our attention to new frontiers. If that’s the case, you can’t carve out the frontiers and then say, “well, except for the frontiers, we’re stagnating”.

Bit bigotry?

In an interview with Cowen, Thiel says stagnation is “in the world of atoms, not bits”:

I think we’ve had a lot of innovation in computers, information technology, Internet, mobile Internet in the world of bits. Not so much in the world of atoms, supersonic travel, space travel, new forms of energy, new forms of medicine, new medical devices, etc.

But again, why should we expect it to be different? Maybe bits are just the current frontier. And what’s the matter with bits, anyway? Are they less important than atoms? Progress in any field is still progress.

The quantitative case

So, we need more than isolated anecdotes, or appeals to intuition. A more rigorous case for stagnation can be made quantitatively. A paper by Cowen and Ben Southwood quotes Gordon: “U.S. economic growth slowed by more than half from 3.2 percent per year during 1970-2006 to only 1.4 percent during 2006-2016.” Or look at this chart from the same paper:

[Chart omitted]

Gordon’s own book points out that growth in output per hour has slowed from an average annual rate of 2.82% in the period 1920-1970, to 1.62% in 1970-2014. He also analyzes TFP (total factor productivity, a residual calculated by subtracting out increases in capital and labor from GDP growth; what remains is assumed to represent productivity growth from technology). Annual TFP growth was 1.89% from 1920-1970, but less than 1% in every decade since. (More detail in my review of Gordon’s book.)

Analyzing growth quantitatively is hard, and these conclusions are disputed. GDP is problematic (and these authors acknowledge this). In particular, it does not capture consumer surplus: since you don’t pay for articles on Wikipedia, searches on Google, or entertainment on YouTube, a shift to these services away from paid ones actually shrinks GDP, but it represents progress and consumer benefit.

Gordon, however, points out that GDP has never captured consumer surplus, and there has been plenty of surplus in the past. So if you want to argue that unmeasured surplus is the cause of an apparent (but not a real) decline in growth rates, then you have to argue that GDP has been systematically increasingly mismeasured over time.

So far, I’ve only heard one only argument that even hints in this direction: the shift from manufacturing to services. If services are more mismeasured than manufactured products, then in logic at least this could account for an illusory slowdown. But I’ve never seen this argument fully developed.

In any case, the quantitative argument is not what convinced me of the stagnation hypothesis nearly as much as the qualitative one.

Sustaining multiple fronts

I remember the first time I thought there might really be something to the stagnation hypothesis: it was when I started mapping out a timeline of major inventions in each main area of industry.

At a high level, I think of technology/industry in six major categories:

* Manufacturing & construction
* Agriculture
* Energy
* Transportation
* Information
* Medicine

Almost every significant advance or technology can be classified in one of these buckets (with a few exceptions, such as finance and perhaps retail).

The first phase of the industrial era, sometimes called “the first Industrial Revolution”, from the 1700s through the mid-1800s, consisted mainly of two fundamental advances: mechanization, and the steam engine. The factory system evolved in part out of the former, and the locomotive was based on the latter. Together, these revolutionized manufacturing, energy, and transportation, and began to transform agriculture as well.

The “second Industrial Revolution”, from the mid-1800s to the mid-1900s, is characterized by a greater influence of science: mainly chemistry, electromagnetism, and microbiology. Applied chemistry gave us better materials, from Bessemer steel to plastic, and synthetic fertilizers and pesticides. It also gave us processes to refine petroleum, enabling the oil boom; this led to the internal combustion engine, and the vehicles based on it—cars, planes, and oil-burning ships—that still dominate transportation today. Physics gave us the electrical industry, including generators, motors, and the light bulb; and electronic communications, from the telegraph and telephone through radio and television. And biology gave us the germ theory, which dramatically reduced infectious disease mortality rates through improvements in sanitation, new vaccines, and towards the end of this period, antibiotics. So every single one of the six major categories was completely transformed.

Since then, the “third Industrial Revolution”, starting in the mid-1900s, has mostly seen fundamental advances in a single area: electronic computing and communications. If you date it from 1970, there has really been nothing comparable in manufacturing, agriculture, energy, transportation, or medicine—again, not that these areas have seen zero progress, simply that they’ve seen less-than-revolutionary progress. Computers have completely transformed all of information processing and communications, while there have been no new types of materials, vehicles, fuels, engines, etc. The closest candidates I can see are containerization in shipping, which revolutionized cargo but did nothing for passenger travel; and genetic engineering, which has given us a few big wins but hasn’t reached nearly its full potential yet.

The digital revolution has had echoes, derivative effects, in the other areas, of course: computers now help to control machines in all of those areas, and to plan and optimize processes. But those secondary effects existed in previous eras, too, along with primary effects. In the third Industrial Revolution we only have primary effects in one area.

So, making a very rough count of revolutionary technologies, there were:

* 3 in IR1: mechanization, steam power, the locomotive
* 5 in IR2: oil + internal combustion, electric power, electronic communications, industrial chemistry, germ theory
* 1 in IR3 (so far): computing + digital communications

It’s not that bits don’t matter, or that the computer revolution isn’t transformative. It’s that in previous eras we saw breakthroughs across the board. It’s that we went from five simultaneous technology revolutions to one.

The missing revolutions

The picture becomes starker when we look at the technologies that were promised, but never arrived or haven’t come to fruition yet; or those that were launched, but aborted or stunted. If manufacturing, agriculture, etc. weren’t transformed, then how could they have been?

Energy: The most obvious stunted technology is nuclear power. In the 1950s, everyone expected a nuclear future. Today, nuclear supplies less than 20% of US electricity and only about 8% of its total energy (and about half those figures in the world at large). Arguably, we should have had nuclear homes, cars and batteries by now.

Transportation: In 1969, Apollo 11 landed on the Moon and Concorde took its first supersonic test flight. But they were not followed by a thriving space transportation industry or broadly available supersonic passenger travel. The last Apollo mission flew in 1972, a mere three years later. Concorde was only ever available as a luxury for the elite, was never highly profitable, and was shut down in 2003, after less than thirty years in service. Meanwhile, passenger travel speeds are unchanged over 50 years (actually slightly reduced). And of course, flying cars are still the stuff of science fiction. Self-driving cars may be just around the corner, but haven’t arrived yet.

Medicine: Cancer and heart disease are still the top causes of death. Solving even one of these, the way we have mostly solved infectious disease and vitamin deficiencies, would have counted as a major breakthrough. Genetic engineering, again, has shown a few excellent early results, but hasn’t yet transformed medicine.

Manufacturing: In materials, carbon nanotubes and other nanomaterials are still mostly a research project, and we still have no material to build a space elevator or a space pier. As for processes, atomically precise manufacturing is even more science-fiction than flying cars.

If we had gotten even a few of the above, the last 50 years would seem a lot less stagnant.

One to zero

This year, the computer turns 75 years old, and the microprocessor turns 50. Digital technology is due to level off in its maturity phase.

### 1AR – No Link – Separations Evolve/Rulemaking Good

#### FTC expertise prevents deterrence of pro-competitive conduct.

First & Fox ’20 [Harry; Professor of Trade Regulation @ NYU; and Eleanor; Professor of Law @ NYU; “We Need Rules to Rein in Big Tech”; NYU Law and Economic Research Paper Series, Working Paper No. 20-46; AS]

Big Tech argues that rule-making is a wrong tack because antitrust violations are complicated and rule-making is blunt. They argue that rules are likely to reach too far; they may prohibit conduct that is pro-competitive, efficient, and innovative. We do not worry. Thanks to the Congressional hearings and hearings by the FTC, we have a good deal of information and a good start. The FTC has strong expertise and we are confident that the Commissioners and staff will listen carefully at rule-making hearings and produce rules that are sound, not overly broad, and sufficiently flexible.

### 1AR – Link Turn – Small Firms Key

#### Even inefficient small firms are better.

Federico et al. ’20 [Giulio; European Commission; Fiona Scott Morton; Yale University and NBER; and Carl Shapiro; University of California, Berkeley, and NBER; “Antitrust and innovation: Welcoming and protecting disruption,” *Innovation Policy and the Economy* 20(1), p. 125-190; AS | GCD]

B. Defense of Dominant Position

Before discussing specific business practices, it is instructive to consider the antitrust treatment of dominant firms in innovative markets more generally. One of the most basic, underlying policy trade-offs is developed in Segal and Whinston (2007). They point out that stricter antitrust policy will increase the profits of an entrant at the expense of the incumbent. Segal and Whinston ask how shifting profits in this manner affects innovation. Their key point is that today’s successful entrant can grow to be tomorrow’s dominant incumbent. In their basic model, that is inevitable, as today’s entrant leapfrogs the incumbent, swapping places and becomes tomorrow’s incumbent. In that model, Segal and Whinston carry out the counterfactual we describe above by altering only the ability to exclude the entrant. They show that stricter antitrust enforcement promotes innovation “precisely when it raises the incremental expected discounted profits over an innovation’s lifetime” (1707). Similarly, Gans (2011) argues that a “static” analysis can often give the right answer regarding innovation.

There are a variety of types of conduct that a dominant firm can use to exclude a rival that threatens its market power. These include tying (as in the US Microsoft case), exclusive dealing, loyalty rebates, and mostfavored nation (MFN) provisions.58 In platform markets, conduct aimed at hindering multihoming on one side of the market may be a particularly effective exclusionary strategy. Multihoming is a strategy that encourages innovation competition because it raises contestability: consumers operating on more than one platform can more easily shift share to a more innovative product. Therefore, policies by a dominant firm that discourage multihoming on one side of the market can have an adverse effect on innovation akin to traditional exclusive dealing arrangements. For example, imagine what would happen if Uber prohibited its drivers from driving for another platform. Because Uber is larger than Lyft, that rule would likely cause most drivers to “single home” (i.e., to drive exclusively) for Uber. That would lower the number of drivers available on Lyft and might well increase wait times on Lyft, causing Lyft to be less attractive to consumers. In the short term, contestability would fall, as an innovation on the Lyft platform would be less visible to consumers, because more of them would single-home on Uber. In addition, if Lyft were to exit some areas, Uber would feel less competitive pressure on price and on innovation in those markets.

Exclusion of a disruptive entrant inherently harms the competitive process, even if that disruptive entrant is (currently) less efficient than the dominant firm. Indeed, that pattern tends to be the norm in industries subject to significant economies of scale (e.g., due to network effects and/or learning by doing). Disrupters that are less efficient at the outset than the established dominant firm can still pose a grave competitive threat to the incumbent, because they have countervailing characteristics that appeal to consumers, or their efficiencies will improve as they gain experience and scale. Regardless of an entrant’s current level of efficiency, the competitive process requires they not be squashed by conduct that does not constitute competition on merit, which can include conduct that would not make economic sense if not for its exclusionary impact on competitors.

Some of the hardest and most important questions in this area relate to business conduct alleged to exclude nascent competitors. Because the nascent competitor’s success can be highly uncertain, for its exclusion to have a large effect on expected consumer welfare, the value of the increased competition in the event of its success must be large. This is most likely to be the case when the incumbent has substantial and durable market power. If consumers have limited options, then even a small chance of the arrival of an effective second choice can be very valuable to them. This observation suggests the use of a sliding scale to assess the impact of challenged business practices on competition: the greater and more durable the incumbent’s market power is, the lower the chance of success by the entrant required for that entrant to warrant protection from exclusionary conduct. This principle is essentially the same to the one we developed in connection with mergers involving uncertain pipeline products and potential challengers to a dominant firm.

#### Best economic research goes aff.

Horton ’21 [Thomas; Professor of Law and Heidepriem Trial Advocacy Fellow @ University of South Dakota Knudson School of Law; “Innovation and Antitrust: An Evolutionary and Historical Perspective,” *Concurrences: Libor Amicorum for Prof. Herbert Hovenkamp of U. Penn School of Law*; AS]

2. Antitrust critics of Schumpeter

Schumpeter’s thesis that economic concentration fosters innovation because monopolists and dominant firms have the requisite resources to invest in innovation and hedge against failed efforts has not gained universal economic or legal support. Decades after Schumpeter first propounded his thesis, Nobel Prize – winning economist Kenneth Arrow disputed Schumpeter’s thesis, arguing that monopolists actually have severely reduced incentives to innovate because they have less to gain due to reduced competition.71 The famous “Schumpeter v. Arrow debates” have generated an extensive array of outstanding economics and legal literature arguing each side’s merits.72 The outcome of this debate “has important consequences for antitrust policy” because if Arrow is correct, then “antitrust has a much bigger role to play.”73

Following Arrow, an increasing number of economics and legal scholars have sided with Arrow over Schumpeter.74 In 1990, for example, economist Michael Porter argued that “the capacity of an industry to innovate and upgrade” is tied directly to highly localized and diverse competitive rivals that exert constant competitive “pressure and challenge.”75 As a result, Professor Porter recommends that we “enforce strong domestic antitrust policies,” and “welcome domestic rivalry.”76

Similar to Professor Porter, economics professors Walter Adams and James Brock conducted in-depth studies of historical innovation in numerous industries, including the automotive, computer, and pharmaceutical industries. They concluded that “for innovation efficiency… the evidence has not been kind to the idolaters and apologists of bigness.”77 Professors Brock and Adams additionally pointed to several landmark antitrust legal decisions supporting their thesis that “market power and industry dominance compound this clash between organizational size and innovation.”78 Professor Brock later additionally pointed out that Schumpeter himself “projected the trajectory of modern capitalism as ineluctably trending toward bureaucratized routine.”79 Schumpeter feared that this could result in “the perfectly bureaucratized giant industrial unit [which] not only ousts the small or medium-sized firm and ‘expropriates’ its owners, but in the end it also ousts the entrepreneur…”80 Professor Brock thus concludes that Schumpeter’s modern-day adherents who criticize aggressive antitrust policies from the right “may have fundamentally misread [both] Darwin and Schumpeter.”81

A number of legal and business scholars have similarly attacked Schumpeter’s thesis that increased concentration enables and buttresses innovation. Professor Marina Lao, for example, argues that “economic theory does not clearly show that market concentration increases innovation, or that consistently resolving [antitrust] ambiguities in favor of dominant firms would enhance (rather than reduce) net industry innovation.”82 Professor Lao contends that in new technology markets, “protecting competition may be inseparable from protecting competitors in these markets.”83 Business Professor Gregory Day, citing to 60 years of merger analysis, similarly posits that “based upon these findings, the major conclusion is that antitrust’s most powerful means of promoting innovation and scientific progress is by preserving the number of firms competing in a market.”84 Numerous other recent commentators have presented similar arguments.85 In the words of John Mauldin of Mauldin Economics: “without competition, you end up with bloated monopolies that may be highly profitable for the owners, but don’t serve the greater cause of economic growth.”86

Along such lines, the European Commission in 2019 released a report entitled Competition Policy for the Digital Era. 87 Seeking to “explore how competition policy should evolve to continue to promote pro-consumer innovation in the digital age,” the authors concluded that, in today’s digital world, incumbents frequently have “a significant competitive advantage.”88 As a result, they recommend “a heightened degree of control of acquisitions of small start-ups by dominant platforms and/or ecosystems…”89 Highlighting “the promotion of innovation as a major goal of competition law,” the Report further observes “that erring to the disadvantage of innovation is likely to be particularly costly in the longer run.”90 The report concludes in part that where the European Commission finds that, “barriers to entry are high and the position of dominance is entrenched,” the Commission should be less concerned with “the appropriability of profits and more concerned with behavior that fortifies or expands positions of power and that decreases both possibilities and incentives for disruptive and complementary innovation.”91 On July 8, 2019, the American Antitrust Institute took similar positions, warning the Justice Department’s Antitrust Division that “consolidation in the market for cloud infrastructure features the rapid acquisition of smaller, potential, or nascent rivals.”92

Coming from a similar, but somewhat different angle, Professors J. Gregory Sidak and David J. Teece have presented what they call a “neo-Schumpeterian” framework for antitrust “that favors dynamic competition over static competition,” and that calls for putting “less weight on market share and concentration in the assessment of market power and more weight on assessing potential competition and enterprise-level capabilities.”93 They call on antitrust regulators “to embrace dynamic competition” for innovation by embracing the recent findings from evolutionary economics, the behavioral theory of the firm, and corporate strategy “to mitigate the harmful unintended consequences of static analysis.”94 Sidak and Teece quickly discard Schumpeter’s proposition that “large firms with monopoly power are necessary to support innovation.”95 Instead, they fully embrace Schumpeter’s earlier (in 1911) embrace “of the virtues of competition fueled by entrepreneurs and small enterprises.”96 They believe that “the basic framework employed in discussions about innovation technology policy, and competitive policy is often remarkably naïve, highly incomplete, and burdened by a myopic focus on market structure as the key determinant.”97 Implicitly following evolutionary theory, Sidak and Teece appropriately observe that “diversity among firms is a fundamental and permanent characteristic of environments undergoing technical change.”98 They point to how “German firms achieved global superiority in dyestuffs in 1914, not because they had superior strategies and organizations, but because large numbers of new entrants and exits gave the German industry more room to experiment with different firm strategies and structures.”99 Ultimately, they conclude:

Indicators of dynamic competition include heterogeneous firms engaging in experimentation and innovation. They develop and introduce new products and processes, and they rework and adjust internal processes. Rivalrous behavior is the norm. An evolutionary approach underscores the importance of maintaining diversity in the economic system. Competition policy authorities as well as other agencies must be concerned with protecting economic diversity and meaningful variety in organizational forms.100

#### Price distortion matters more for long term innovation than scale, customer access and complementary tech effects combined.

Lemley and Creary ’21 [Mark and Andrew; Professor of Law @ Stanford and JD MBA Candidate @ Stanford; “EXIT STRATEGY”; 101 B.U. L. REV. 1 (2021)]

But perhaps we should be happy about, or at least fine with, sales of startups to incumbents. There are at least three reasons why that might be true about any particular merger, and other reasons we might want to put up with anticompetitive consequences in order to encourage investment in startups. First, some technologies might work well only at scale. Some artificial intelligence ("AL") inventions may require a sufficiently large database to train on, for instance. Those inventions might work better in the hands of a company like Google that already has access to most of the text and images in the world than in the hands of a company without such a comprehensive training dataset. 288

Second, the incumbent might get the innovation into the hands of more people, simply because it has more customers. 289 Entry may be inefficient on this view because the entrant will have to prove the value of the innovation to consumers and often require them to switch away from products they already know and like. 290 "[E]xpected consumer welfare can be higher under commercialization by sale [from a small innovator to an incumbent] despite the risk of increased market power." 29 1

Third, the market leaders may be best positioned to put complementary technologies to work. Their complementary assets may be more synergistic, their cash on hand greater and more immediately deployed, their engineers more talented, and their business know-how more complete-all resulting in their being able to bring proposed products to life better and faster than anyone else. 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. 292 Further, incumbent acquisitions prevent potential competitors from combining to form a company that can credibly threaten entry at scale. 293 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.

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. 294 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. 295 And incumbents don't need to innovate to stay alive if they can buy any entrant that looks like a threat.296

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.297 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 Al 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.298

Competition, in short, is an externality to an incumbent-startup merger transaction. Consumers benefit from the possibility of competition-both in terms of choice and potentially lower prices and because competition may drive more innovation. But the merging firms don't capture those benefits, and so they naturally ignore them in favor of maximizing the private benefits they get by cementing a monopoly and selling the startup for a price that reflects that monopoly profit. That doesn't mean that there are no benefits to such a merger. But companies have an incentive to engage in those mergers even when they aren't in the public interest.