Paper Reading Notes

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Contents

1 Trade

1.1 Buera and Oberfield (2020)

- Innovation and diffusion involving the combination of new ideas with insights from other industries.
- both gains from trade and the fraction of variation of TFP growth accounted for by changes in trade more than double relative to a model without diffusion.

1.2 Chen et al. (2022)

- Asymetric transport costs from different shipping time back and forth predicts location patterns in models with models Dixit-Stiglitz preferences.
- Armington (1969) assumption: each country produces a different good and consumers would like to consume at least some of each country's goods. No mention of comparative advantage, but combined with CES characterizes trade flows between countries.
- Dixit-Stiglitz preference: CES function
- Dixit-Stiglitz price index: bilateral prices times bilateral iceberg shipping costs. The index can be interpreted as consumer or inward market access

1.3 Amiti et al. (2020)

- US-China tariff announcements lower investment growth rate of listed US companies by 1.9% by the end of 2020
- policy-induced stock-market declines imply lower returns to capital, which lowers investment rates
- use stock market data to exactly decompose aggregate returns into those caused by common and differential effects
- q theory of investment to understand how trade shocks affect investment in a model where capital adjustment is costly

1.4 Akcigit et al. (2018a)

1.5 Fernandes et al. (2023)

1.6 Martin et al. (2023)

1.7 Demidova and Rodríguez-Clare (2009)

- Welfare: productivity, terms of trade, variety, curvature (heteorogenity across varieties)
- consumption subsidy, export tax, import tariff allows small economy to deal with two distortions and reach first-best allocation
- export subsidy generates increase in productivity, but negative on other three, decrease welfare
- import tariff improves small economy's welfare

1.8   Demidova (2017)

- Monopolistic competition with heterogenous firms, endogenous wages, non-separable, non-homothetic quadratic preferences generating variable markups
- optimal level of the revenue generating import tariff is strictly positive
- reductions in cost-shifting trade barriers are welfare-improving
- in both cases, variable markups result in negative pro-competitive effects, reducing gains from trade

1.9   Costinot et al. (2020)

- Large firms tend to export
- country maximizing domestic welfare, self-selection of heterogenous firms into exports calls for import subsidies on the least profitable foreign firms
- there is no rationale for export subsidies or taxes on the least profitable domestic firms

1.10   Atkeson and Burstein (2008)

1.11   Allen (2014)

- A perfect competition trade model embedding a process whereby heterogeneous producers engage in a costly sequential search process to determine where to sell their product.
- introducing information frictions explains roughly half the observed regional price dispersion, and improves the out-of-sample predictive power of the model

1.12   Steinwender (2018)

- Transatlantic telegraph in 1866 lowers average and volatility of the transatlantic price difference of cotton, and increases those of trade flows.
- Efficiency gains 8% of export value
- A partial equilibrium model in which exporters and storage use the latest news about a foreign market to forecast expected prices.
- Newly collected data set on cotton prices, trade and information flows from historical newspapers.

1.13   Suesse (2018)

- Relationship between prospective secessions on economic integration and growth.
- A game theory model rationalizes that regional elites have an incentive to restrict domestic trade once secession from the Soviet Union became possible.

2   Industrial Policy

2.1   Aghion et al. (2015)

- Industrial policies allocated to competitive sectors or that foster competition in a sector increase productivity growth.

2.2 Juhász et al. (2023)

2.3 Mazzucato and Rodrik (2023)

- Table of Taxonomy of conditionalities in the case studies
  - Type of firm behavior targeted: access, directionality, profit sharing, reinvestment
  - Fixed versus negotiable/ iterative conditions
  - Risks/ rewards sharing mechanism
  - Measurable performance criteria and monitoring and evaluation
- Embeddedness, autonomy and the development state matrix

2.4 Rodrik (2018)

2.5 Aiginger and Rodrik (2020)

- Chronique of industrial policy definition since 1981

2.6 McMillan et al. (2017)

- Two theories explaining growth: 1) **dual-economy.** draws distinction between agriculture as traditional and industry as modern sectors of economy. Different economic logics are at work within so cannot be lumped together. Accumulation innovation and productivity growth take place in the modern sector, the traditional sector remains technologically backward and stagnant. Labor and other resources migration rate to modern sector decides growth rate. Lewis 1954, Ranis and Fei 1961.
  2) **neoclassical growth model.** presumes different economic activity are structurally similar enough to aggregate into a representative sector. growth depends on the incentives to save, accumulate physical and human capital, and innovate by developing new products and processes. Solow 1956, Grossman and Helpman 1991, Aghion and Howitt 1992.
- two challenge: structural transformation and fundamentals. **Former**, ensure resources flow rapidly to high productivity. **Latter**, on broad and long-run growth two driving forces: quality of institutions(governance, law, biz environment) or the level of human capital(education, skills, training). Acemoglu Johnson Robinson 2001, Glaeser et al 2004.
- Results
  - Brazil and Botswana: structural change important in launching into middle-income but tiny role thereafter
  - Vietnam and Ghana: structural change significant contribution
  - India, Nigeria Zambia: structural change different way. less rapid decline in the employment share of low-productivity agriculture, exacerbated by the lack of labor-intensive manufacturing for export.
- Typology of growth patterns: structural transformation $\times$ Investment in fundamentals
- total labor productivity:$P_t = \sum\limits_{i=1}^{n} \theta_{i,t} P_{i,t}$.

  Change in total labor productivity $\Delta P_t = \sum\limits_{i=1}^{n} \theta_{i,t-k} \Delta P_{i,t} + \sum\limits_{i=1}^{n} \Delta P_{i,t-k} + \sum\limits_{i=1}^{n} \Delta \theta_{i,t} \Delta P_{i,t}$

- productivity change as sum of with-in sector change and structural change

$$\Delta P_t = \sum_{i=1}^{n} \theta_{i,t-k} \Delta P_{i,t} + \sum_{i=1}^{n} P_{i,t} \Delta \theta_{i,t}$$

3 Innovation

3.1 Aghion et al. (2001)

3.2 Prato (2022)

- Meeting rate

3.3 Bahar and Rapoport (2018)

- Proxy for knowledge diffusion: cross-country productivity spillovers leading to new exports
- 10% increase in immigration from exporters is associated with a 2% increase in the host country exporting in next decade likelihood, especially stronger for highly-skilled migrants.

3.4 Hornung (2014)

- Firm-level productivity data on Prussian manufactories in 1802 from the Register of factories in the prussian state by the Royal Prussian Privy Filing Department
- Huguenot immigration to Brandenburg-Prussia data. Rôle général des Français refugiez dans les États de la Majesté le Roy de Prusse
- population censuses for Prussian towns in 1730. Schmoller 1922
- higher share of high-skilled immigrants means higher level of local manufactory output and more technology employed

3.5 Bai et al. (2023)

3.6 Adão et al. (2020)

3.7 Liu and Ma (2021)

3.8 Kogan et al. (2017)

- Technological innovation accounts for significant medium-run fluctuations in aggregate economic growth adn TFP.
- patent-level estimates of private economic value are positively related to the scientific value of these patents
- Extended data: `https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-G`

3.9 Aghion et al. (2005)

- Competition discourages laggard firms from innovating and encourages neck-and-neck firms. This generates and inverted-U, together with competition on equilibrium industry structure
- average tech distance btw leaders and followers increases with competition
- the inverted-U is steeper when industries are more neck-and-neck

3.10 König et al. (2016)

- Firms endogenously choose between in-house R&D and imitation other firm's tech subject to limits of absorptive capacities to improve productivity based on profit maximization motive
- closer to technological frontier face fewer imitation opportunities, more in-house
- BGE features persistent productivity differences even when starting from identical firms

4 Search and Unemployment

4.1 Mortensen and Pissarides (1994)

4.2 Shimer (2005)

4.3 Hornstein et al. (2011)

4.4 Lenoir et al. (2022)

- Search friction of new customers distort the allocation activities across heterogeneous producers in a Ricardian model of trade.
- Markets with high estimated frictions display less dispersion in sales btw high and low productivity firms
- Increase in the level of search frictions pushes out the least productive exporters while increases export sales at the top of the productivity distribution

5 Heterogenous Agents

5.1 Aiyagari (1994)

5.2 Krusell and Anthony A. Smith (1998)

6 Firm Dynamics

6.1 Hopenhayn (1992)

6.2 Kochen (2023)

6.3 Arellano et al. (2012)

6.4 Cooley and Quadrini (2001)

- Introducing financial-market frictions in a basic model of industry dynamics with persistent shocks
- the combination of persistent shocks and financial frictions can account for the simultaneous dependence of firm dynamics on size (once we control for age) and on age (once we control for size).

6.5 Jovanovic (1982)

- This is the seminal paper to incorporate uncertainty and learning into entrepreneurship and firm dynamics.

6.6 Klette and Kortum (2004)

6.7 Melitz (2003)

7 Uncertainty

7.1 Arellano et al. (2019)

8 Empirical

8.1 Du et al. (2012)

- Using a manufacturing firm-level panel for 1998 through 2007, we find zero or weak positive horizontal externalities
- foreign direct investment (FDI) has generated positive productivity spillovers to domestic firms via backward linkages (the contacts between foreign affiliates and their local suppliers in downstream sectors) as well as forward linkages (between foreign suppliers and their local buyers in the upstream sectors).

8.2 Oberfield and Raval (2021)

- Aggregate capital-labor elasticity reflects substitution within plants and reallocation across plants;
- aggregate elasticity for the U.S. manufacturing sector in 0.5-0.7, declined slightly since 1970.

8.3 Zhang and Wang (2023)

- Employers in higher social trust societies are more attentive to applicants' potential, focusing more on their foundational skills than readiness like advanced skills
- bilateral trust measures
- 60 million job postings from 28 EU countries from 2018 to 2021 provided by Lightcast, formerly known as Burning Glass Technologies
- multinational corps from Orbis global database matching based on employer name, industry and location
- ESCO is a multilingual classification that identifies and categorize skills and occupations relevant to the EU labor market
- social trust measured by nationally representative surveys European Values Study (EVS)

8.4 de Souza et al. (2022)

- DiD + trade model with input-output connections where sanctioning countries maximize income and minimize Russia's income

- small willingness to pay: 20% uniform tariff against all Russian products
- embargo on mining and energy and 50% on others is most cost-efficient

8.5 Diao et al. (2021)

- The poor employment performance of large firms is related to use of capital-intensive techniques associated with global trends in technology.
- larger firms that exhibit superior productivity performance do not expand employment much
- small firms that absorb employment do not experience any productivity growth.
- Relatively large firms in the manufacturing sectors of Tanzania and Ethiopia are significantly more capital-intensive than what would be expected on the basis of the countries' income levels or relative factor endowments
- Reasons: 1, advanced economies develop labour saving technology; 2, globalization and the spread of global value chains has had a homogenizing effect on technology adoption, and the imperative of competing with production in richer countries at similar quality level makes it difficult to undertake large shifts in techniques
- New panels of manufacturing firms: Tanzania 2008∼ 16, Ethiopia 1996∼ 2017

8.6 Laplane and Mazzucato (2020)

- Policies that explicitly take into consideration the risk-taking entrepreneurial role of the state, can positively affect reward distributions and favor more equitable public| private partnerships.
- Sharing rewards enables a more portfolio mindset, where the upside is used to cover the downside, and more stable funding to serve citizens' needs. It also signals the value and legitimacy of the state's role.
- Table of existing policy instruments for financing innovation that allow for profit-Sharing
- Table of the legal underpinning of the distribution of rewards in public|private partnerships parasitic versus symbiotic ecosystems

8.7 Rodrik (2016)

- Developing countries only converge to rich country income levels conditional on country-specific disadvantages like institutions or poor geography being overcome.
- Matrix of structural change and investment in fundamentals
- much of recent performance in Africa due to advantageous external context and making up of lost ground
- structural change and industrialization operating at less than full power
- should there be a miracle, it should be agriculture or service led than traditional ones.

8.8 Aghion et al. (2018)

- inventor collect 8% of total private return
- entrepreneurs get over 44%

- blue-collar get 26%
- the rest goes to white-collar workers
- entrepreneurs have negative returns prior to patent application but subsequently become highly positive
- Finland data

8.9   Akcigit et al. (2018b)

- Higher taxes negatively impact the quantity and the location of innovation, but not average innovation quality.
- state-level elasticities to taxes are large and consistent with the aggregation of the individual level responses of innovation produced and cross-state mobility
- corporate taxes have special effect on corporate inventor's innovation production and mobility
- personal income tax affects quantity of innovation and mobility of inventors.
- panel of patent inventors since 1920
- historical state-level corporate tax database with corp tax rates and tax base information
- existing: state-level personal income taxes

8.10   Munch and Schaur (2018)

- Export promotion increases sales, value-added, employment, and value-added per worker.
- For small firms, summing expenditures on export promotion, subsidies, and tax distortions, the gain in value-added is roughly three times higher than the direct costs of export promotion.

9   Migration

9.1   Docquier et al. (2015)

- Complete liberalization of cross-border migration increase world GDP by 11.5-12.5% in benchmark model, and 7.0-17.9% in robustness analyses.

9.2   Parsons and Vézina (2018)

- The exodus of Vietnamese Boat People to US evidence that migrant networks promote trade by reducing trade costs because they have knowledge of their home country's language, regulations, market opportunities and informal institutions. Migrants mostly facilitate bilateral trade with developing countries.
- Doubling migrants leads to 45% to 138% increase in state exports.
- First evidence of positive link between migration and trade with a natural experiment.

9.3   BURCHARDI et al. (2019)

- Doubling the number of residents with ancestry from a given foreign country relative to the mean increases the probability that at least one local firm engages in FDI with that

country by 4 percentage points.

- This effect is primarily driven by a reduction in information frictions, and not by better contract enforcement, taste similarities, or a convergence in factor endowments.

9.4 COHEN et al. (2017)

- Firms are significantly more likely to trade with countries that have a large resident population near their firm headquarters, and that these connected trades are their most valuable international trades
- Firms are also more likely to acquire target firms, and report increased segment sales, in connected countries

9.5 Burchardi and Hassan (2013)

- Personal relationships for non-economic reasons can be an important determinant of regional economic growth.
- HHs in West Germany with East ties experience rise in incomes and increases returns to entrepreneurial activity, share of HHs as entrepreneurs, and likelihood of West German firm investing East regionally.

10 Tax

10.1 Zucman (2014)

- 20% of US corporate profits now booked in tax havens. Over 15 years, effective corporate tax rate of US companies declined from 30 to 20p, 2/3 of the decline attributable to increased profit-shifting to low-tax jurisdictions.

11 AI

11.1 Economic Essence

As a technology:

- As LLM that generates contents (Felten et al. (2023),Eloundou et al. (2023)) Automation technique other than robots: more influence on higher skill demand. Causing cross generation inequality (Katz and Murphy (1992), Sachs and Kotlikoff (2012), Hémous and Olsen (2022), Acemoglu and Restrepo (2018)) and drop in labor share of income (Mookherjee and Ray (2022), Shimizu and Momoda (2023)) by augmenting capital (Zhang (2023)). In capital-skill complementarity (Ohanian et al. (2023))
- Reversely, patent data shows lower skill wage rise encourages and higher discourages automation innovation. (Hémous et al. (2019))
- General purpose technology: inherent potential for technical improvements, pervasiveness and innovational complementarities (Bresnahan and Trajtenberg (1995), Agrawal et al. (2019), Agrawal et al. (2023), Goldfarb et al. (2023), Bresnahan (2023), Eloundou et al. (2023))
- More widely speaking, the Schumpeterian idea of creative destruction (Acemoglu (1998), Acemoglu (2002), Aghion et al. (2018),)

11.2 Productivity

- Empirical
  GenAI can improve productivity, especially for those under-skilled tasks, 14% by Brynjolfsson et al. (2023) (Damioli et al. (2021)). 0.8sd decrease in time taken and 0.4sd raise in output quality in college level writing tasks (Noy and Zhang (2023)). It also doubles the speed of software engineers coding speed (Kalliamvakou (2022)). But does not change the direction of technical progress in the applications of ICT (Bresnahan (2021))

- Model
  Gries and Naudé (2020) build an endogenous growth model with task approach and hetero HH, finds that 1, AI decrease labor income share 2, with high elasticity of substitution, AI reduce aggregate demand and slow down GDP growth. Berg et al. (2018) presents a model takes robot capital substitutable with human labor, and only capitalists and skilled workers save. They show in various scenarios automation good for growth and bad for equality (real per capita income rises 30-240% in long run). Lu (2021)'s three sector endo growth model shows growth increase in transitional dynamics, but not necessarily beneficial to HH in short and long run.

11.3 Labor

- Empirical
  Eloundou et al. (2023) finds that 80% of US workforce have 10% tasks affected, and 19% see 50%. Higher-income, higher education, lower experience jobs more exposed. 15% workers faster with LLM, and 47%-56% with LLM-embedded tools. Chen et al. (2023) apply their work on China labor market. This weakens job creation stimulus (Ebeke and Eklou (2023)). On the other hand, AI reduces the skill premium as long as it is more substitutable for high-skill workers than low-skill workers are for high-skill workers. (Bloom et al. (2023)) but increase those with AI-skill (11% Alekseeva et al. (2021)). In line with a rich body of literature on the impact of automation as polarization (Autor et al. (2003), Autor et al. (2006), Van Reenen (2011), Brynjolfsson et al. (2023)) and high-tech across generations (Adão et al. (2020)). Korinek (2023) suggests economists can be 10-20% more productive in ideation, writing, background research, data analysis, coding, and mathematical derivations (among other specific impacts research Felten et al. (2023), et al. (2022), Mollick and Mollick (2022))

- Model
  Acemoglu and Restrepo (2018) endogenizes, in a task-based model, capital accumulation, direction of research toward automation and creation of new tasks and argues that if long-run rental rate of capital relative to wage is sufficiently low, all tasks will be automized, otherwise there exists a stable BGP. Intuition is that automation reduces labor cost, discouraging future automation. Inequality increases during transitions driven by faster automation and the introduction of new tasks. (see also Acemoglu and Autor (2011), Basso and Jimeno (2021), Afonso et al. (2023))

11.4 Inequality

- Empirical
  Within cohort: Acemoglu and Restrepo (2022). Cross generation: Adão et al. (2020). Globalization: reverse the gains of developing countries by saving labor and resource, giving rise to winner-takes-all dynamics. Tech-skill mismatch in labor cause TFP differences across

countries (Acemoglu and Zilibotti (2001), Zeira (2006), Korinek and Stiglitz (2021))

- Model
  Inequality increase in the US labor market reflects the automation and computerization of routine tasks, favoring high-skill workers (Autor et al. (2003)) and by raising returns to wealth (Moll et al. (2022)). Recent innovations caused occupational composition and training favorable for younger and against older (Adão et al. (2020), Prettner and Strulik (2020)). Cong et al. (2021)'s endogenous growth model shows that less developed economies with low growth at the dawn of data economy may face a new form of poverty trap that potentially warrants interventions.

12 Data

12.1 Macro

- Groningen Growth and Development Centre: indicators of growth and development `https://www.rug.nl/ggdc/`

12.2 Medical

- Medical Expenditure Panel Survey `https://meps.ahrq.gov/mepsweb/`
- FDA Orange book `https://www.fda.gov/drugs/drug-approvals-and-databases/approved-drug-product`

12.3 Trade

- GlobalTradeAlert `https://www.globaltradealert.org/`
- Cboe Trade Alerts `https://www.cboe.com/services/analytics/tradealert/institutions/`
- UN Comtrade: product level bilateral trade data `https://comtradeplus.un.org/TradeFlow`
- Global Antidumping database by Bown, Chad P. `https://www.chadpbown.com/global-antidumping-databas`
- OECD's Inter-Country Input-Output (ICIO) tables that maps flows of production, consumption, investment within countries and flows of international trade in goods and services btw countries, by economic activity and by country `https://www.oecd.org/sti/ind/inter-country-input-output-tables.htm`
- Feenstra et al. (2002) `https://papers.ssrn.com/sol3/papers.cfm?abstract_id=362069`
- Copenhagen Polis Centre of ancient greek cities and people `https://polis.stanford.edu/`

12.4 Legal

- LobbyView `https://www.lobbyview.org/`
- QuantGov `https://www.quantgov.org/`

12.5 Innovation

- Orgiin IP Solutions `https://origiin.com/`
- PATENTS-ICRIOS DATABASE `https://icrios.unibocconi.eu/resources/databases/patents-icrios-database`
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12.6 Firm

- FactSet Supply Chain Relationships `https://wrds-www.wharton.upenn.edu/pages/about/data-vendors/factset/`
- Cortellis `https://access.clarivate.com/login?app=cortellis`
- Westlaw Edge `https://legal.thomsonreuters.com/en/products/westlaw-edge`
- MIDAS `https://www.iqvia.com/solutions/commercialization/brand-strategy-and-management/market-measurement/midas`

- Namsor `https://namsor.app/`
- GGDC 10 Sector database
- expanded africa sector database
- UNIDO's Indstat2

12.7   Transport

- TUD19: multi-city traffic dataset `https://utd19.ethz.ch/`; `https://github.com/ambuehll/UTD19`
- Ship tracking data Kpler `https://www.kpler.com/product/maritime/ship-tracking`

12.8   Migration

- Gallup Global Research`https://www.gallup.com/analytics/318875/global-research.aspx`
- Gallup Country Data Set `https://www.gallup.com/services/177797/country-data-set-details.aspx`
- Bilateral migration data `https://elibrary.worldbank.org/doi/epdf/10.1596/1813-9450-6863`

12.9   Others

- GeoDist on bilateral relationships such as common coloniser, colony-coloniser, common language, religion. `http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele_item.asp?id=6`

Bibliography

Acemoglu, D. (1998). Why do new technologies complement skills? directed technical change and wage inequality. *The Quarterly Journal of Economics*, 113(4):1055–1089.

Acemoglu, D. (2002). Directed Technical Change. *The Review of Economic Studies*, 69(4):781–809.

Acemoglu, D. and Autor, D. (2011). Chapter 12 - skills, tasks and technologies: Implications for employment and earnings. volume 4 of *Handbook of Labor Economics*, pages 1043–1171. Elsevier.

Acemoglu, D. and Restrepo, P. (2018). The race between man and machine: Implications of technology for growth, factor shares, and employment. *American Economic Review*, 108(6):1488–1542.

Acemoglu, D. and Restrepo, P. (2022). Tasks, automation, and the rise in u.s. wage inequality. *Econometrica*, 90(5):1973–2016.

Acemoglu, D. and Zilibotti, F. (2001). Productivity differences. *The Quarterly Journal of Economics*, 116(2):563–606.

Adão, R., Beraja, M., and Pandalai-Nayar, N. (2020). Technological transitions with skill heterogeneity across generations. Working Paper 26625, National Bureau of Economic Research.

Afonso, O., Sequeira, T., and Almeida, D. (2023). Technological knowledge and wages: from skill premium to wage polarization. *Journal of Economics*, 140(2):93–119.

Aghion, P., Akcigit, U., Hyytinen, A., and Toivanen, O. (2018). On the returns to invention within firms: Evidence from finland. *AEA Papers and Proceedings*, 108:208–12.

Aghion, P., Bloom, N., Blundell, R., Griffith, R., and Howitt, P. (2005). Competition and Innovation: an Inverted-U Relationship*. *The Quarterly Journal of Economics*, 120(2):701–728.

Aghion, P., Cai, J., Dewatripont, M., Du, L., Harrison, A., and Legros, P. (2015). Industrial policy and competition. *American Economic Journal: Macroeconomics*, 7(4):1–32.

Aghion, P., Harris, C., Howitt, P., and Vickers, J. (2001). Competition, imitation and growth with step-by-step innovation. *The Review of Economic Studies*, 68(3):467–492.

Agrawal, A., Gans, J., and Goldfarb, A., editors (2019). *The Economics of Artificial Intelligence: An Agenda*. University of Chicago Press.

Agrawal, A., Gans, J. S., and Goldfarb, A. (2023). Artificial intelligence adoption and system-wide change. *Journal of Economics & Management Strategy*, pages 1–11.

Aiginger, K. and Rodrik, D. (2020). Rebirth of industrial policy and an agenda for the twenty-first century. *Journal of Industry, Competition and Trade*, 20:189–207.

Aiyagari, S. R. (1994). Uninsured idiosyncratic risk and aggregate saving. *The Quarterly Journal of Economics*, 109(3):659–684.

Akcigit, U., Ates, S. T., and Impullitti, G. (2018a). Innovation and trade policy in a globalized world. Working Paper 24543, National Bureau of Economic Research.

Akcigit, U., Grigsby, J., Nicholas, T., and Stantcheva, S. (2018b). Taxation and innovation in the 20th century. Working Paper 24982, National Bureau of Economic Research.

Alekseeva, L., Azar, J., Giné, M., Samila, S., and Taska, B. (2021). The demand for ai skills in the labor market. *Labour Economics*, 71(C):S0927537121000373.

Allen, T. (2014). Information frictions in trade. *Econometrica*, 82(6):2041–2083.

Amiti, M., Kong, S. H., and Weinstein, D. (2020). The effect of the u.s.-china trade war on u.s. investment. Working Paper 27114, National Bureau of Economic Research.

Arellano, C., Bai, Y., and Kehoe, P. J. (2019). Financial frictions and fluctuations in volatility. *Journal of Political Economy*, 127(5):2049–2103.

Arellano, C., Bai, Y., and Zhang, J. (2012). Firm dynamics and financial development. *Journal of Monetary Economics*, 59(6):533–549.

Atkeson, A. and Burstein, A. (2008). Pricing-to-market, trade costs, and international relative prices. *American Economic Review*, 98(5):1998–2031.

Autor, D. H., Katz, L. F., and Kearney, M. S. (2006). The polarization of the u.s. labor market. *American Economic Review*, 96(2):189–194.

Autor, D. H., Levy, F., and Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration*. *The Quarterly Journal of Economics*, 118(4):1279–1333.

Bahar, D. and Rapoport, H. (2018). Migration, knowledge diffusion and the comparative advantage of nations. *The Economic Journal*, 128(612):F273–F305.

Bai, Y., Jin, K., and Lu, D. (2023). Technological rivalry and optimal dynamic policy in an open economy. Working Paper 31703, National Bureau of Economic Research.

Basso, H. and Jimeno, J. F. (2021). From secular stagnation to robocalypse? implications of demographic and technological changes. *Journal of Monetary Economics*, 117(C):833–847.

Berg, A., Buffie, E. F., and Zanna, L.-F. (2018). Should we fear the robot revolution? (the correct answer is yes). *Journal of Monetary Economics*, 97:117–148.

Bloom, D. E., Prettner, K., Saadaoui, J., and Veruete, M. (2023). Artificial intelligence and the skill premium. Papers, arXiv.org.

Bresnahan, T. (2021). *Artificial Intelligence Technologies and Aggregate Growth Prospects*, pages 132–170.

Bresnahan, T. (2023). What innovation paths for ai to become a gpt? *Journal of Economics & Management Strategy*, n/a(n/a):1–12.

Bresnahan, T. F. and Trajtenberg, M. (1995). General purpose technologies 'engines of growth'? *Journal of Econometrics*, 65(1):83–108.

Brynjolfsson, E., Li, D., and Raymond, L. (2023). Generative ai at work.

Buera, F. J. and Oberfield, E. (2020). The global diffusion of ideas. *Econometrica*, 88(1):83–114.

BURCHARDI, K. B., CHANEY, T., and HASSAN, T. A. (2019). Migrants, ancestors, and foreign investments. *The Review of Economic Studies*, 86(4 (309)):pp. 1448–1486.

Burchardi, K. B. and Hassan, T. A. (2013). The economic impact of social ties: Evidence from german reunification. *The Quarterly Journal of Economics*, 128(3):1219–1271.

Chen, Q., Ge, J., Xie, H., Xu, X., and Yang, Y. (2023). Large language models at work in china's labor market. Papers, arXiv.org.

Chen, Y., Ioannides, Y. M., and Rauch, F. (2022). Asymmetric trading costs and ancient greek cities. Technical Report DP17204, CEPR.

COHEN, L., GURUN, U. G., and MALLOY, C. (2017). Resident networks and corporate connections: Evidence from world war ii internment camps. *The Journal of Finance*, 72(1):207–248.

Cong, L. W., Xie, D., and Zhang, L. (2021). Knowledge accumulation, privacy, and growth in a data economy. *Management Science*, 67(10):6480–6492.

Cooley, T. F. and Quadrini, V. (2001). Financial markets and firm dynamics. *American Economic Review*, 91(5):1286–1310.

Costinot, A., Rodríguez-Clare, A., and Werning, I. (2020). Micro to macro: Optimal trade policy with firm heterogeneity. *Econometrica*, 88(6):2739–2776.

Damioli, G., Van Roy, V., and Vertesy, D. (2021). The impact of artificial intelligence on labor productivity. *Eurasian Business Review*, 11(1):1–25.

de Souza, G., Hu, N., Li, H., and Mei, Y. (2022). (trade) war and peace: How to impose international trade sanctions. Technical report, SSRN. Available at SSRN: `https://ssrn.com/abstract=4153921` or `http://dx.doi.org/10.2139/ssrn.4153921`.

Demidova, S. (2017). Trade policies, firm heterogeneity, and variable markups. *Journal of International Economics*, 108:260–273.

Demidova, S. and Rodríguez-Clare, A. (2009). Trade policy under firm-level heterogeneity in a small economy. *Journal of International Economics*, 78(1):100–112.

Diao, X., Ellis, M., McMillan, M. S., and Rodrik, D. (2021). Africa's manufacturing puzzle: Evidence from tanzanian and ethiopian firms. Working Paper 28344, National Bureau of Economic Research.

Docquier, F., Machado, J., and Sekkat, K. (2015). Efficiency gains from liberalizing labor mobility. *The Scandinavian Journal of Economics*, 117(2):303–346.

Du, L., Harrison, A., and Jefferson, G. H. (2012). Testing for horizontal and vertical foreign investment spillovers in china, 1998–2007. *Journal of Asian Economics*, 23(3):234–243.

Ebeke, C. H. and Eklou, K. (2023). Automation and the employment elasticity of fiscal policy. *Journal of Macroeconomics*, 75(C):S0164070423000022.

Eloundou, T., Manning, S., Mishkin, P., and Rock, D. (2023). Gpts are gpts: An early look at the labor market impact potential of large language models.

et al., R. B. (2022). On the opportunities and risks of foundation models.

Feenstra, R. C., Romalis, J., and Schott, P. K. (2002). U.s. imports, exports, and tariff data, 1989-2001. Technical Report w9387, National Bureau of Economic Research.

Felten, E. W., Raj, M., and Seamans, R. (2023). How will language modelers like chatgpt affect occupations and industries? Technical report. Available at SSRN: `https://ssrn.com/abstract=4375268` or `http://dx.doi.org/10.2139/ssrn.4375268`.

Fernandes, A. M., Klenow, P. J., Meleshchuk, S., Pierola, M. D., and Rodríguez-Clare, A. (2023). The intensive margin in trade: How big and how important? *American economic journal. Macroeconomics*, 15(3):320–354.

Goldfarb, A., Taska, B., and Teodoridis, F. (2023). Could machine learning be a general purpose technology? a comparison of emerging technologies using data from online job postings. *Research Policy*, 52(1):104653.

Gries, T. and Naudé, W. (2020). Artificial intelligence, income distribution and economic growth.

Hopenhayn, H. A. (1992). Entry, exit, and firm dynamics in long run equilibrium. *Econometrica*, 60(5):1127–1150.

Hornstein, A., Krusell, P., and Violante, G. L. (2011). Frictional wage dispersion in search models: A quantitative assessment. *The American Economic Review*, 101(7):2873–2898.

Hornung, E. (2014). Immigration and the diffusion of technology: The huguenot diaspora in prussia. *The American Economic Review*, 104(1):84–122.

Hémous, D., Dechezleprêtre, A., Olsen, M., and Zanella, C. (2019). Automating labor: Evidence from firm-level patent data. CEPR Discussion Papers 14249, C.E.P.R. Discussion Papers.

Hémous, D. and Olsen, M. (2022). The rise of the machines: Automation, horizontal innovation, and income inequality. *American Economic Journal: Macroeconomics*, 14(1):179–223.

Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*, 50(3):649–670.

Juhász, R., Lane, N. J., and Rodrik, D. (2023). The new economics of industrial policy. Working Paper 31538, National Bureau of Economic Research.

Kalliamvakou (2022). Research: Quantifying github copilot's impact on developer productivity and happiness. `https://github.blog/2022-09-07-research-quantifying-github-copilots-impact-on-developer-productivity-and-happiness/`.

Katz, L. F. and Murphy, K. M. (1992). Changes in relative wages, 1963-1987: Supply and demand factors. *The Quarterly Journal of Economics*, 107(1):35–78.

Klette, T. and Kortum, S. (2004). Innovating firms and aggregate innovation. *Journal of Political Economy*, 112(5):986–1018.

Kochen, F. (2023). Finance over the life cycle of firms. Job market paper, CEMFI.

Kogan, L., Papanikolaou, D., Seru, A., and Stoffman, N. (2017). Technological Innovation, Resource Allocation, and Growth*. *The Quarterly Journal of Economics*, 132(2):665–712.

Korinek, A. (2023). Generative ai for economic research: Use cases and implications for economists. *Journal of Economic Literature*, 61(4):1281–1317.

Korinek, A. and Stiglitz, J. E. (2021). Artificial intelligence, globalization, and strategies for economic development. Working Paper 28453, National Bureau of Economic Research.

Krusell, P. and Anthony A. Smith, J. (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of Political Economy*, 106(5):867–896.

König, M. D., Lorenz, J., and Zilibotti, F. (2016). Innovation vs. imitation and the evolution of productivity distributions. *Theoretical Economics*, 11(3):1053–1102.

Laplane, A. and Mazzucato, M. (2020). Socializing the risks and rewards of public investments: Economic, policy, and legal issues. *Research Policy*, 49:100008. Articles initially published in Research Policy: X issue 2.

Lenoir, C., Martin, J., and Mejean, I. (2022). Search Frictions in International Goods Markets. *Journal of the European Economic Association*, 21(1):326–366.

Liu, E. and Ma, S. (2021). Innovation networks and r&d allocation. Working Paper 29607, National Bureau of Economic Research.

Lu, C.-H. (2021). The impact of artificial intelligence on economic growth and welfare. *Journal of Macroeconomics*, 69(C):S0164070421000458.

Martin, J., Mejean, I., and Parenti, M. (2023). Relationship Stickiness, International Trade, and Economic Uncertainty. *The Review of Economics and Statistics*, pages 1–45.

Mazzucato, M. and Rodrik, D. (2023). Industrial policy with conditionalities: A taxonomy and sample cases.

September 2023.

McMillan, M., Rodrik, D., and Sepulveda, C. (2017). Structural change, fundamentals and growth: A framework and case studies. Working Paper 23378, National Bureau of Economic Research.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6):1695–1725.

Moll, B., Rachel, L., and Restrepo, P. (2022). Uneven growth: Automation's impact on income and wealth inequality. *Econometrica*, 90(6):2645–2683.

Mollick, E. R. and Mollick, L. (2022). New modes of learning enabled by ai chatbots: Three methods and assignments. Technical report, SSRN. Available at SSRN: `https://ssrn.com/abstract=4300783` or `http://dx.doi.org/10.2139/ssrn.4300783`.

Mookherjee, D. and Ray, D. (2022). Growth, automation and the long-run share of labor. *Review of Economic Dynamics*, 46:1–26.

Mortensen, D. T. and Pissarides, C. A. (1994). Job creation and job destruction in the theory of unemployment. *The Review of Economic Studies*, 61(3):397–415.

Munch, J. and Schaur, G. (2018). The effect of export promotion on firm-level performance. *American Economic Journal: Economic Policy*, 10(1):357–387.

Noy, S. and Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. Technical report, SSRN. Available at SSRN: `https://ssrn.com/abstract=4375283` or `http://dx.doi.org/10.2139/ssrn.4375283`.

Oberfield, E. and Raval, D. (2021). Micro data and macro technology. *Econometrica*, 89(2):703–732.

Ohanian, L., Orak, M., and Shen, S. (2023). Revisiting capital-skill complementarity, inequality, and labor share. *Review of Economic Dynamics*, 51:479–505.

Parsons, C. and Vézina, P.-L. (2018). Migrant networks and trade: The vietnamese boat people as a natural experiment. *The Economic Journal*, 128(612):F210–F234.

Prato, M. (2022). The global race for talent: Brain drain, knowledge transfer, and growth. Ssrn working paper, SSRN.

Prettner, K. and Strulik, H. (2020). Innovation, automation, and inequality: Policy challenges in the race against the machine. *Journal of Monetary Economics*, 116(C):249–265.

Rodrik, D. (2016). An african growth miracle? *Journal of African Economies Advance Access*. Revised version of the paper written for the Center for Global Development, Richard H. Sabot Lecture, on April 24, 2014.

Rodrik, D. (2018). What do trade agreements really do? *Journal of Economic Perspectives*, 23(2):73–90.

Sachs, J. D. and Kotlikoff, L. J. (2012). Smart Machines and Long-Term Misery. NBER Working Papers 18629, National Bureau of Economic Research, Inc.

Shimer, R. (2005). The cyclical behavior of equilibrium unemployment and vacancies. *American Economic Review*, 95(1):25–49.

Shimizu, R. and Momoda, S. (2023). Does automation technology increase wage? *Journal of Macroeconomics*, 77(C):S0164070423000411.

Steinwender, C. (2018). Real effects of information frictions: When the states and the kingdom became united. *The American Economic Review*, 108(3):657–696.

Suesse, M. (2018). Breaking the unbreakable union: Nationalism, disintegration and the soviet economic collapse. *The Economic Journal*, 128(615):2933–2967.

Van Reenen, J. (2011). Wage inequality, technology and trade: 21st century evidence. *Labour Economics*, 18(6):730–741. European Association of Labour Economists, 3rd World Conference EALE/SOLE, London UK, 17-19 June2010.

Zeira, J. (2006). Machines as engines of growth. DEGIT Conference Papers c011_059, DEGIT.

Zhang, L. and Wang, S. (2023). Trusting talent: Cross-country differences in hiring. Working Paper.

Zhang, P. (2023). Endogenous capital-augmenting r&d, intersectoral labor reallocation, and the movement of the labor share. *Journal of Economics*, 140(1):1–36.

Zucman, G. (2014). Taxing across borders: Tracking personal wealth and corporate profits. *Journal of Economic Perspectives*, 28(4):121–48.