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Is the Global Economy Deglobalizing? If So, Why? And What Is Next?

ABSTRACT Data on global trade as well as capital and labor flows indicate a slowdown, but not reversal, of globalization since the 2008–2009 financial crisis. Yet profound changes in the policy environment and public sentiment in the largest economies over the past five years suggest the beginning of a new era. Increasing anxiety about the labor market effects of import competition from low-wage countries, especially China, laid the groundwork but was not the catalyst for the reversal in attitudes toward globalization. Similarly, the COVID-19 pandemic provided novel arguments against free trade based on global supply chain resilience, but neither the pandemic nor short-run policy response had enduring effects on trade flows. We demonstrate that global trade was remarkably resilient during the pandemic and that supply shortages would likely have been more severe in the absence of international trade. After a temporary decline in 2020, global trade in goods and services increased sharply in 2021. Russia's invasion of Ukraine raised new concerns about national security and the exposure of supply chains to geopolitical risk. This was followed by demands to diversify away from "non-friendly" countries and toward the employment of trade policy, export restrictions in particular, to halt China's technological development. The future of globalization is highly uncertain at this point, but these new policies will likely slow global growth, innovation, and poverty reduction even if they benefit certain industries in certain countries. Regarding resilience, the main goal of recent trade policy changes, measures of trade volatility or concentration can be helpful, but resilience will be elusive as long as we lack benchmarks against which policy performance can be measured.

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At a December 2022 opening of a semiconductor chip plant in Phoenix, Arizona, Morris Chang, founder of Taiwan Semiconductor Manufacturing Company, stated "globalization is almost dead and free trade is almost dead . . . I don't think they will be back" (Ting-Fang 2022, par. 5). Such claims are not new. For the past decade economists have been debating the future of globalization, pointing out that since the financial crisis of 2008–2009, world trade has been growing more slowly than GDP—a reversal of an earlier trend observed during the two decades that marked the era of so-called hyper-globalization (1989–2009). Using data up to the onset of the COVID-19 pandemic, Goldberg (2019) and Antràs (2020) argued that there was little systematic evidence to support the view that the world economy had entered an era of deglobalization. However, the past three years have seen dramatic changes in trade policy and geopolitical environments that call for a reevaluation of this view.

No matter how one feels about globalization these days, there is wide consensus that it has had substantial effects on global growth, poverty reduction, and inequality (both across and within countries)—not to mention its political, societal, and cultural consequences.[1] It is no surprise that the possibility of its reversal has become a central question in policy and public discourse. This paper has three aims: (1) to critically assess existing evidence regarding the deglobalization hypothesis, (2) to analyze the causes of a potential deglobalization trend, and (3) to assess, speculatively at this point, the consequences of potential deglobalization. It is accordingly organized in three sections, each reflecting these aims.

Traditional metrics of globalization (trade, capital flows, immigration) still show no sign of trend reversal—if anything, they suggest that trade has rebounded after the COVID-19 pandemic. However, the policy environment and public sentiment toward globalization have fundamentally changed, especially in the largest economies. To the extent that policy and public opinion help shape economic outcomes, there are therefore good reasons to believe that we have entered a new era. Regarding the causes of this trend, there seem to be three phases in the deglobalization sentiment.

The first phase starts around 2015 with concerns about the impact of import competition from low-wage countries, especially China, on the labor market, and the impact of refugee flows, primarily in Europe. Such concerns

1. See Irwin (2019) and Chari, Henry, and Reyes (2021) for a review of the evidence on the relationship between trade and growth and a reevaluation of the critical assessment of Rodríguez and Rodrik (2000).

make the general public receptive to protectionist policies. This phase is marked by Brexit and the United States and China increasing tariffs on one another, the economic effects of which were meaningful but still not substantial enough to reverse decades-old globalization trends.

The second phase plays out during the COVID-19 pandemic when new arguments against trade emerge: temporary shortages of personal protective equipment and other items are attributed to the fragility of global supply chains. Demands for greater resilience through greater dependence on domestic production provide a novel justification for reshoring economic activity. We argue that the evidence does not support these claims and that, if anything, trade increased economies' resilience during the COVID-19 pandemic. While the demands for resilience did not have any direct implications for policy or trade during this period, and trade actually grew fast following the pandemic, the extensive coverage of the topic in the press further contributed to the notion that globalization had harmful effects to the domestic economy and prepared the ground for the third phase.

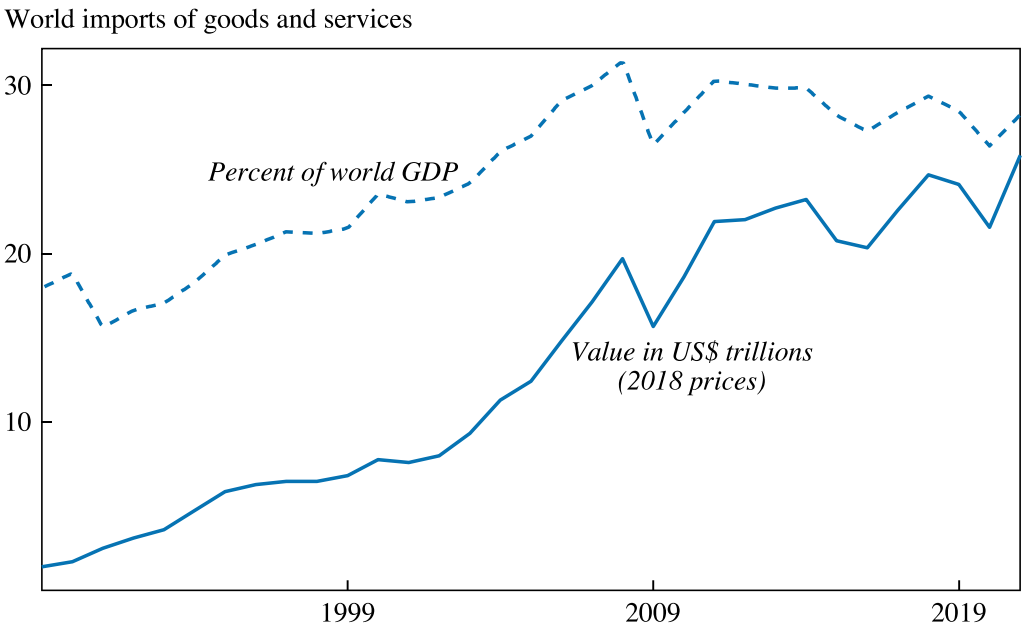
The third phase begins with the Russian invasion of Ukraine in February 2022 and provides the perhaps strongest argument to date for rethinking globalization: concerns about national security. The reliance of Europe on Russia for energy exposes the fragility of a global supply system based on hyper-specialization. New demands for "decoupling" emerge, not just from Russia, but from any country that is not our friend, and a new term enters the international trade vocabulary: "friendshoring." The talk is followed by strong policy actions by the United States that include sweeping export restrictions in the semiconductor sector targeting China (McKinnon and Fitch 2022; Ellerbeck 2023). These developments can plausibly be considered the markers of a new era.

Given that these trends are only a few months old, any assessment of their consequences is inevitably highly speculative. With this caveat in mind, we offer some concluding thoughts and very preliminary evidence on possible effects of deglobalization on efficiency, inflation, global and within-country inequality, resilience, and peace.

I. Is the World Economy Deglobalizing?

While we do not formally define globalization, we employ three different approaches to capturing trends toward or away from it. First, we examine trends in some key variables (such as world exports and imports, capital flows, and immigration) that have been traditionally viewed as appropriate metrics of globalization. Second, we assess the trade policy environment.

Figure 1. Trade Is Growing, but Has Declined as a Percentage of World GDP since the Global Financial Crisis



Sources: COMTRADE; World Trade Organization; and World Bank.

Note: Nominal value of goods imports is from COMTRADE, and nominal value of services trade is from the World Trade Organization, both reported in US dollars. The sum of nominal trade values is divided by world GDP in US dollars at market exchange rates (NY.GDP.MKTP.CD GDP in the World Bank Development Indicators). Nominal trade values are converted to 2018 prices using the GDP deflator (NY.GDP.DEFL.ZS) for the United States.

Finally, we consider how public discourse has changed in recent years by analyzing the occurrence of certain terms in news articles.

I.A. Trends in Standard Metrics of Globalization

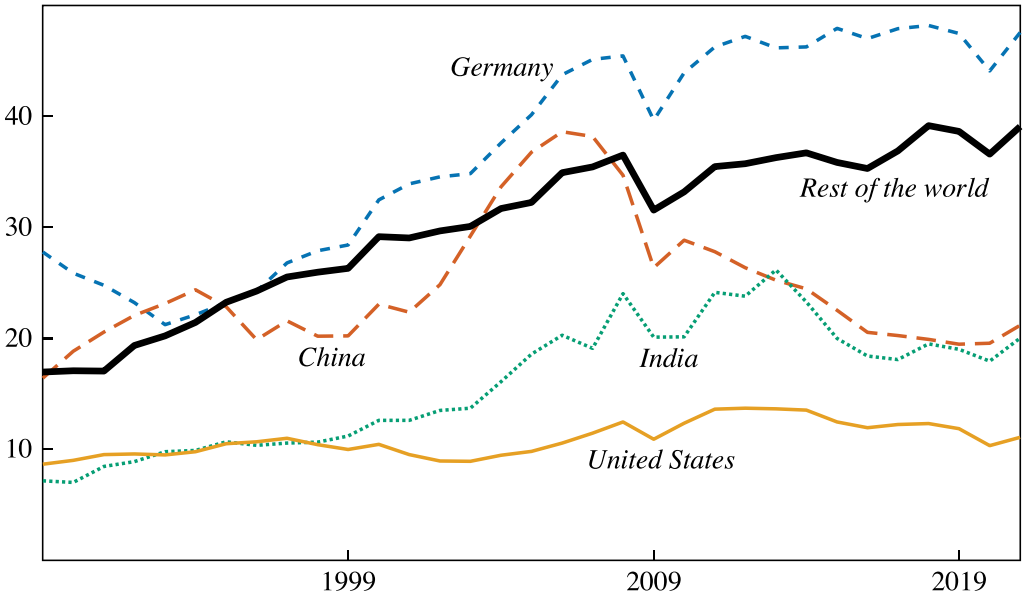
A popular measure of globalization is international trade in goods and services. World imports have grown rapidly in the last three decades, including post-2009, as shown in figure 1. Notably, world imports increased sharply in 2021 after a temporary decline in 2020 due to COVID-19, showing trade's longer-term resilience to the pandemic. Yet, when measured as share of GDP, imports have slightly declined since the global financial crisis. This is the aforementioned trend that has led to concerns that the world has started deglobalizing post-2009. Because the decline is too small to justify the term "deglobalization," "slowbalization" has been used instead as a more appropriate characterization of this trend.

The mirror of world imports are world exports, which generate an almost identical picture. Panel A of figure 2 reports trends in exports since 1989

Figure 2. Countries Have Diverse Experiences with Globalization

Panel A: Exports of goods and services

Percent of country's GDP



Panel B: Intermediate goods imports

Percent of country's GDP

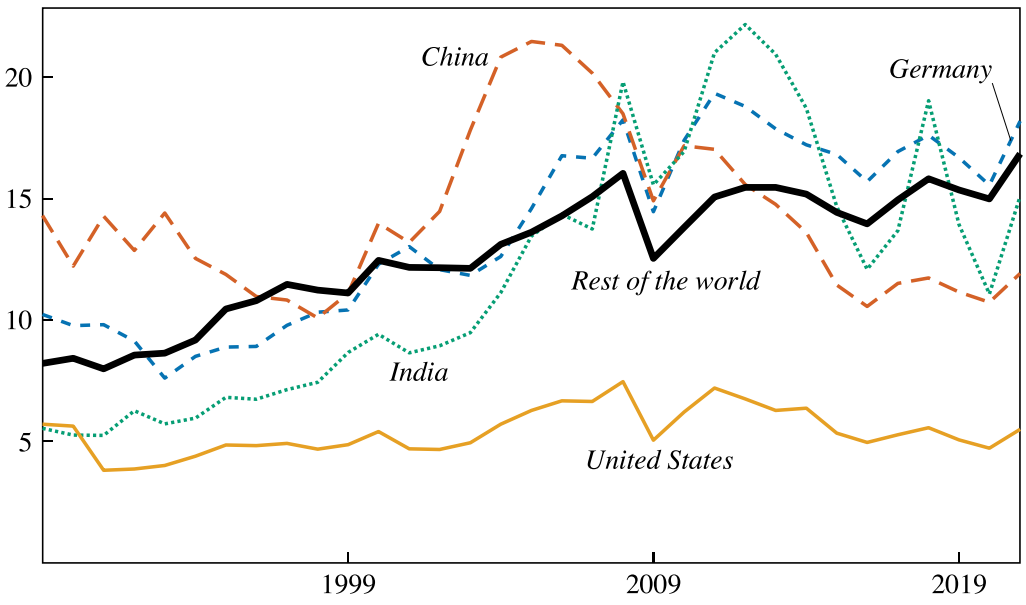


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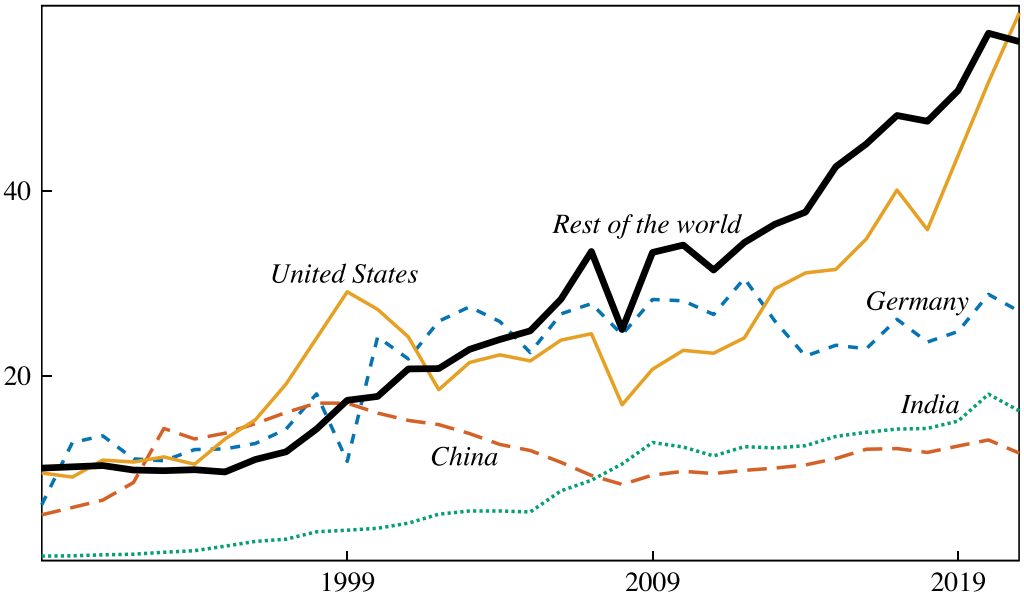
Figure 2. Countries Have Diverse Experiences with Globalization (*Continued*)

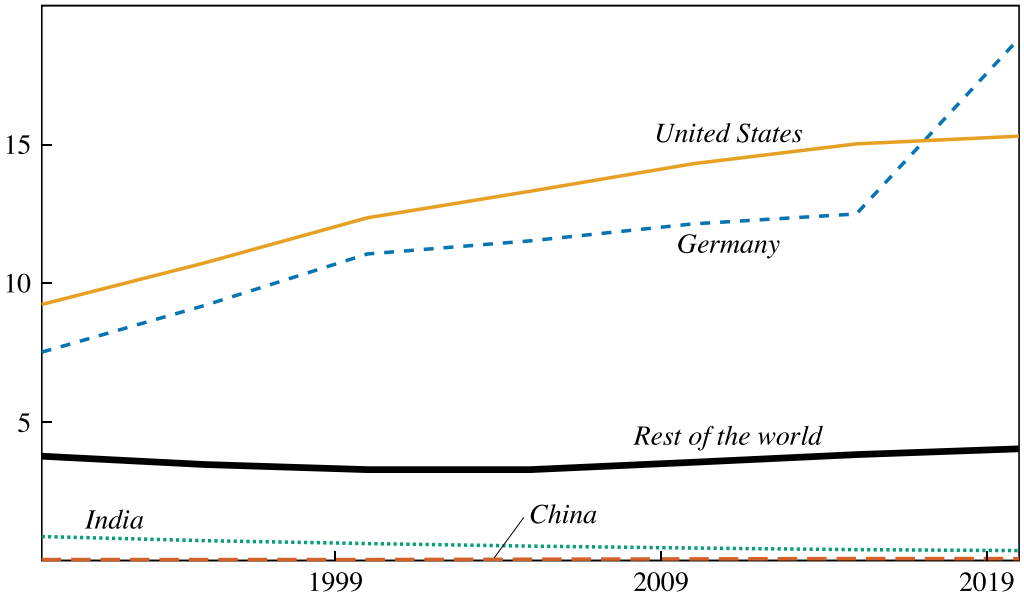
Panel C: Stock of inward foreign direct investment

Percent of country's GDP



Panel D: Stock of inward migrants

Percent of country's population



Sources: COMTRADE; United Nations Conference on Trade and Development (UNCTAD); United Nations Global Migration Database; and World Bank.

Note: Intermediate goods in panel B are classified according to the Broad Economic Categories (BEC4) of the Standard International Trade Classification system. The stock of foreign direct investment in panel C includes equity investments with foreign ownership greater than 10 percent and reinvested profits accruing to that ownership. The stock of inward migrants in panel D includes all foreign-born residents of a country.

for four large economies and the rest of the world. Examining these trends at the individual country level highlights how amid global trends, national integration with the global economy is changing. China and India appear to be less reliant on the global economy. Exports as a share of GDP have declined in both countries, from peaks during the 2000s in the case of China and the 2010s in the case of India, leveling off at about 20 percent of GDP in both economies. On the other hand, Germany's exports have been increasing since the 1990s, except for brief interruptions during the global financial crisis and COVID-19 pandemic, so that exports now account for almost 50 percent of GDP. In the United States, exports have held steady at about 10 percent of GDP. In the rest of the world, exports are about 35 percent of GDP, indicating greater reliance on the global economy for demand than China, India, or the United States.

These figures highlight diverse experiences with globalization. Globalization has allowed the United States to enjoy the consumption of foreign goods, borrowing to purchase the exports of the rest of the world. China and India have exploited this demand to fuel their own growth from a low income. They now rely less on the global economy and instead on their own populations, which are richer and can support domestic demand. Germany, which is nearly as rich as the United States, shows low wages are not a prerequisite for export success.

The imports of intermediate goods and services as a share of countries' GDP are shown in panel B of figure 2. Such imports are essential inputs into exports, especially for countries participating in global value chains (GVCs), where different stages of production processes are located across different countries. The World Bank (2020) estimates that GVCs account for 50 percent of global trade but that their growth has plateaued. Intermediate goods imports are a declining share of GDP in China and India, as both countries now produce more inputs domestically. These two economies are becoming less reliant on the global economy for inputs. Though it is less stark, there is also a downward trend in intermediate imports in Germany and the United States. In the rest of the world, the trend is instead slightly upward. Overall, the trends in the trade data suggest a slowdown of global trade, but this is hardly surprising given the extraordinarily fast trade growth during the two decades of hyper-globalization (1989–2009).[2]

Measures of globalization in factor markets provide a different perspective. The stock of inward foreign direct investment (FDI) in panel C of figure 2 measures the globalization of capital markets. In the United States

2. For a more detailed discussion of this point, see Goldberg (2019) and Antràs (2020).

and the rest of the world the stock of inward FDI accounts is valued at nearly 60 percent of GDP and shows no major downward trend. In Germany, inward FDI as a share of GDP in the last two decades grew until the global financial crisis but has not yet recovered from that peak. China experienced a boom in FDI in the 1990s that preceded the boom in exports in the 2000s. In India, the rise in exports and increase in FDI from the mid-2000s onward go hand in hand. Figure A1 in the online appendix shows positive trends are similar when counting the sum of debt and equity foreign investment, using the series of Coppola and others (2021), which also incorporates foreign investment through tax havens. In panel C of figure 2, the level of inward foreign investment is greater in China and Germany relative to the level in figure A1 in the online appendix, reflecting greater reliance on debt financing in these economies. The series in figure A1 includes debt in addition to foreign direct investment, which includes only purchases of equity shares.

The stock of inward migrants in panel D of figure 2 measures the globalization of labor markets. Germany and the United States have absorbed migrants as an increasing share of their population, with Germany recently surpassing the United States as it absorbed a surge of refugees in the 2010s. China and India are home to far fewer migrants as a share of their population, and this trend appears flat.

There are two main takeaways from figure 2. First, it is clear that the growth of trade as a percentage of GDP has stalled since the financial crisis, and even declined in some cases. However, trends in capital and labor markets tell a different story. Taken together, these trends suggest that it is premature to talk of deglobalization—the slowdown of global trade seems a natural development following its earlier fast growth and reflects partly the growth of the domestic markets of two large, formerly low-income countries, China and India. Second, deglobalization trends are highly heterogeneous across countries. While the United States and China—the world's two largest economies, which by virtue of their economic size drive aggregate trends—seem to be gradually decreasing their reliance on global markets, this is not true for the rest of the world.

I.B. Policy Environment

While the data do not yet show strong signs of deglobalization, the trade policy environment has changed drastically in the past five years, especially in the United States. This is important as trade and other measures of globalization may respond with a lag to changing policies.

Since the end of World War II, global trade barriers had been gradually falling, while a proliferation of bilateral and regional trade agreements allowed many countries to become more integrated in world markets. Several developing countries reduced their tariffs unilaterally and joined the World Trade Organization (WTO), which allowed them to enjoy many of the benefits of multilateralism. The United States and other advanced economies played a leading role in the reduction of trade barriers and the design of the world trading system.

The picture changed dramatically in 2018, when the United States announced a first set of tariff increases targeting several countries, but especially China. Eventually these tariff increases led to a tariff war between the United States and China, the world's two largest economies in 2018 and 2019. The United States also imposed tariff increases on steel and aluminum imports from nearly all countries. Despite the change in the US administration, most of these tariffs remain in place to date. The United States continues to argue within the dispute resolution process that these tariffs are required for national security, though it has also declined to elaborate the mechanism through which discriminatory tariffs improve its national security. In December 2022, in response to challenges brought by China, Norway, Switzerland, and Türkiye, a WTO dispute settlement panel found that the tariffs indeed violated WTO rules. Article 21 of the General Agreement on Tariffs and Trade allows WTO members to discriminate against one another for national security reasons "in time of war or other emergency in international relations" (21.b.3) but the panel concluded that the year 2018 did not constitute such a time.

Additionally, the US practice of exercising its veto power to block the appointment of new judges in the WTO's Appellate Body as the terms of existing judges ended has rendered the WTO's dispute settlement system defunct. US dissatisfaction with the way trade disputes between countries are resolved within the international rules-based system had been simmering for years, but it was not until the end of 2019, when the terms of the last two judges expired, that the crisis reached its peak, paralyzing the dispute settlement process, effectively ending twenty-three years of WTO trial-like enforcement, the keystone of international efforts to prevent trade protectionism. The Appellate Body now lacks a quorum to hear appeals, so that the United States, for instance, could not even appeal this recent ruling if it wanted to. One interpretation of US actions is that they are less about dissatisfaction with the WTO system for resolving disputes than about dissatisfaction with outcomes that are not in the United States' favor.

While other countries could take this approach, some nonetheless still find the spirit of WTO dispute resolution useful, with, for instance, the EU and Türkiye recently opting to use arbitration in the absence of the Appellate Body to resolve a dispute over rules requiring local content in pharmaceuticals purchased by Türkiye's national health scheme.[3] The EU challenged these rules and won in arbitration, an alternative mechanism available in the WTO charter to appeal disputes. Although Türkiye lost, with the arbitrator finding WTO rules require it to end a "buy Turkish" rule for pharmaceuticals, Türkiye was willing to go through arbitration.

More recently, there has been a clear shift in the US approach to trade away from liberalization and multilateralism toward industrial policy and discriminatory policies vis-à-vis China in the name of supply chain resilience and national security. This shift was first apparent in the speech that Ambassador Katherine Tai, the US Trade Representative, gave at the Roosevelt Institute's Progressive Industrial Policy Conference on October 7, 2022.[4] It became even more salient a week later, when the White House released its *National Security Strategy*, which poignantly begins with the words: "The world is changing" (White House 2022, 6). The report came a few days after the announcement of sweeping export restrictions on the semiconductor industry aimed at stopping China from advancing technologically. According to the report, the restrictions were justified in the name of national security, specifically, the military-civilian fusion as practiced by China, and the increasing significance of dual-use goods, that is, goods that are designed for commercial applications but that have military applications.

These actions signal a clear break from former US trade policy and the possible beginning of a new era. So does the CHIPS and Science Act which provides multibillion-dollar support for the development of the domestic semiconductor industry, several discriminatory provisions in the Inflation Reduction Act toward countries that are not members of the United States-Mexico-Canada Agreement, and the United States distancing from new trade agreements, such as the Comprehensive and Progressive Agreement

3. World Trade Organization, "Turkey: Certain Measures concerning the Production, Importation, and Marketing of Pharmaceutical Products," https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds583_e.htm.

4. Office of the United States Trade Representative, "Remarks by Ambassador Katherine Tai at the Roosevelt Institute's Progressive Industrial Policy Conference," https://ustr.gov/about-us/policy-offices/press-office/speeches-and-remarks/2022/october/remarks-ambassador-katherine-tai-roosevelt-institutes-progressive-industrial-policy-conference#:~:text=We%20believe%20industrial%20policy%20and,opening%2C%20liberalization%2C%20and%20efficiency.

for Trans-Pacific Partnership (CPTPP). The United States did in May 2022 propose a new economic agreement with the largest economies in Asia and Oceania except for China, called Indo-Pacific Economic Framework for Prosperity (IPEF). This agreement is envisioned to include commitments to standards for digital trade, decarbonization, labor standards, and tax enforcement, but there has been no mention of US market access, which has been the traditional focus of trade agreements, and which is also highly valued by trade partners.[5]

Meanwhile, several other countries are going in the opposite direction, at least when it comes to economic agreements. The recent signing of the Regional Comprehensive Economic Partnership between the ten member states of the Association of Southeast Asian Nations that went into effect on January 1, 2022, the expanding membership of the CPTPP as more countries request to join, and the launching of the African Continental Free Trade Area which aims to boost intra-African trade, are examples of a trend toward more regional or—in the case of the CPTPP—plurilateral integration. Along the same lines, Fajgelbaum and others (2022) show that while the trade war between the United States and China reduced trade in the targeted product categories between these two countries, it boosted trade between other countries and the rest of the world in these products. The countries that exhibited the largest export growth to the rest of the world were countries with expansive trade agreements. So the trade conflict between the world's two largest economies did not simply cause reallocation of global trade flows, it also generated new trade opportunities for other countries. Therefore, it seems that outside the United States the picture is more nuanced, with many countries striving to take advantage of the new opportunities potentially created by the reversal of US policy.

Note, however, that one of the most assertive recent moves of the United States, the export restrictions in the semiconductor sector targeting China, requires the cooperation of other countries to succeed. Because most of the semiconductor chip manufacturing takes place in countries other than the United States—using, however, to a large extent US software and US machinery—the new export controls require third-country chip manufacturers to obtain export licenses from the United States in order to export their products to China. The United States implemented this policy change

5. The CPTPP did include commitments on digital trade, environment, and labor which the United States had lobbied for before it exited the agreement. From this perspective the IPEF could be a way for the United States to achieve some of the goals it had pursued in the CPTPP negotiations, but without making commitments of further market access.

unilaterally, putting allies in a difficult position as they faced a choice between going along with the export restrictions or—if they wished to continue exporting to China—forgoing access to US technology. This use by the United States of economic interdependence to force other countries to go along with its policies has been called "weaponizing interdependence."[6] It suggests that no matter what other countries' preferences and intentions are, ultimately it is the priorities of the largest economy of the world that may shape the future of the global economic system. Seen in this light, the United States turning inward may have important implications for the future of globalization.

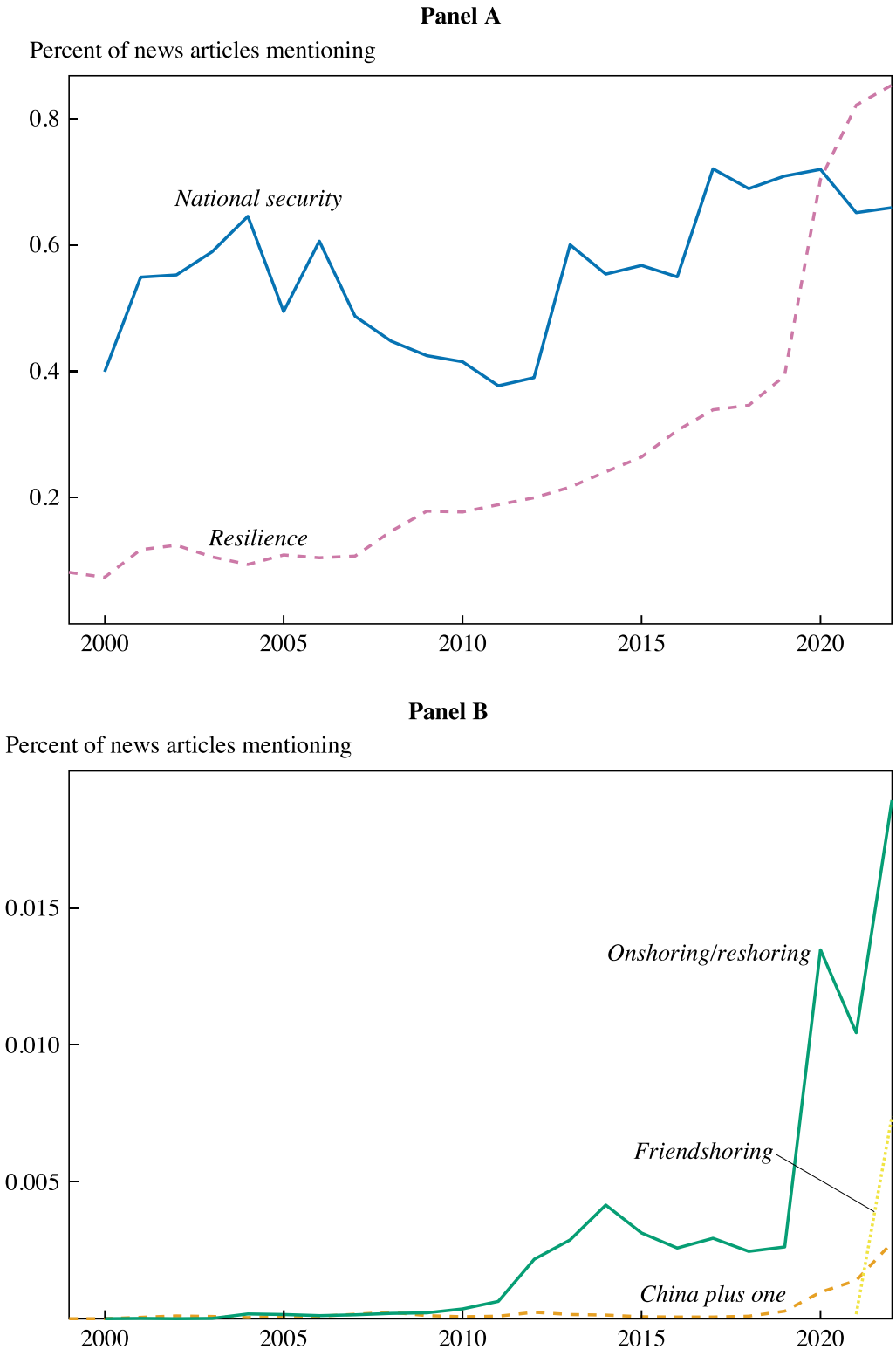
I.C. Public Discourse

Just as economic variables respond with a lag to policy, policy responds with a lag to public sentiment and attitudes. Therefore, we now turn to an investigation of such attitudes regarding trade and globalization. Data from the PEW global attitudes surveys show that the public still views trade as beneficial to the economy.[7] However, news articles suggest more nuanced attitudes marked by increasing skepticism about participation in the global economy.

Panel A of figure 3 shows that mentions of the term "resilience" have been increasing since the global financial crisis, with an acceleration during the COVID-19 pandemic. This could reflect an increasing awareness that global supply chains expose countries and companies to risk but need not cast doubt on the underlying trade. Doubts may instead be reflected in the increasing use of the phrase "national security." Surprisingly, today this phrase occurs in a greater percentage of news articles than immediately after September 11, 2001, and after the Arab Spring and the NATO intervention in Libya in 2011. It is difficult to pinpoint the proximate cause of the increasing salience of national security in 2013 and again in 2017. The beginning of the nationalist Donald Trump administration is one hypothesis for the latter, and though mentions of national security dropped sharply after the election of Joe Biden in 2021, it is still used nearly twice as much as in 2000. Panel B of figure 3 shows the emergence of other less common jargon. The words "onshoring" and "reshoring" emerged into frequent use in 2010. This suggests that skepticism of globalization predated the Trump administration, during which use of the terms skyrocketed.

6. The phrase was coined by Farrell and Newman (2019).
7. See Dorn and Levell (2021, 32, fig. 8).

Figure 3. Trends in Documents Mentioning "Resilience," "National Security," "Onshoring" or "Reshoring," "Friendshoring," "China Plus One"



Source: Factiva.

Not all discourse has been nationalist. After 2017, the phrase "China Plus One" also began to emerge in the business press, a recognition of China's important role in global supply chains and the need to diversify to at least one alternative supplier. In 2021, US Secretary of Commerce Gina Raimondo introduced the concept of friendshoring.[8] The term is now associated with policy aimed at moving US value chains away from China. Yet, compared to onshoring or reshoring, it also suggests a more moderate view of globalization, that it should continue and may deepen, but only with a subset of countries who are friends.[9]

I.D. Summary

Trends in goods and services trade, both for the global economy and for major economies, suggest a slowdown (though not reversal) of globalization. But FDI and migrant flows suggest the opposite. Overall, to date, there is no hard evidence in the data that we have entered a new era. There are, however, profound changes in the policy environment, at least in the United States, as well as in general attitudes toward trade with other countries that may be the harbinger of—if not deglobalization—a new kind of globalization. Prominent among these are the concern about national security, the demand to diversify away from China, and the belief that trade should only be promoted if it is between friends. These issues are distinct from the more traditional concern about the impact of globalization on low-skill workers in advanced economies, which has traditionally been the reason for advocating reshoring. Their origins seem rooted more in (geo) politics than economics. Accordingly, we may be entering an era where the future of trade and globalization is shaped top-down by politically motivated governments rather than by market forces.

II. Causes

II.A. What Caused Hyper-Globalization?

The factors that have contributed to the hyper-globalization of the 1990s and 2000s have been extensively analyzed in the literature. The World

8. US Department of State, "Telephonic Press Briefing with U.S. Secretary of Commerce Gina M. Raimondo," November 18, 2021, https://www.state.gov/telephonic-press-briefing-with-u-s-secretary-of-commerce-gina-m-raimondo/.

9. This stance is also reflected in US Secretary of the Treasury Janet Yellen's (2022) piece on resilient trade.

Bank's 2020 *World Development Report* on global value chains (GVCs) provides a succinct summary of the main drivers, which involve a combination of technology and policy. Major technological advances after World War II led to dramatic declines in transportation and communication costs that enabled the fragmentation of the production process, so that different stages of production could be outsourced to different countries to take advantage of international cost differences. This process led to the emergence and growth of GVCs and to unprecedented growth in gross trade as intermediate goods and services crossed borders many times before final products reached their intended destinations. But technology alone would not have achieved this growth had it not been for a set of policies that created the right environment for trade and GVCs to flourish: sharp reductions in tariff and nontariff barriers, often within the context of unilateral trade liberalizations by developing countries; bilateral and regional trade agreements that liberalized trade for the member countries; and last but not least, the expansion of the WTO to include several developing countries, including China.[10] Multilateralism played an important role during this period by reducing uncertainty. When goods and services are traded across the entire globe, regional agreements do not suffice; only multilateralism can offer the degree of stability and predictability required for global trade to flourish.[11] At the same time, the ideological shift toward neoliberalism, fueled by the fall of communism in Eastern Europe and the former Soviet Union, provided a supporting intellectual backdrop for the changes that were taking place, encouraging the entry of several countries in Eastern Europe, Central Asia, and East Asia into the global trading system.

Against this background, it is natural to ask what has changed since that time, causing a possible reversal of earlier trends. Not surprisingly, the main drivers are the same factors that led to the hyper-globalization of the past: technology and policy.

II.B. What Is Causing a Possible Reversal?

TECHNOLOGY There are two reasons one might suspect that the slowdown of trade (as percentage of GDP) since the financial crisis could be technologically driven.

10. See Irwin (2022) for an overview of the trade reform wave of 1985–1995, the years leading up to the era of hyper-globalization.

11. For a more detailed discussion, see Goldberg and Pavcnik (2016), Goldberg (2019), and Goldberg and Larson (2023).

The first reason is that the fragmentation of production underlying the expansion of GVCs and trade would eventually reach its technological limit. In fact, some have viewed the decline of trade in intermediates (evident in figure 2) as evidence that the fragmentation of production has run its course. However, as Goldberg (2019) argues, this evidence is far from conclusive. Apart from the fact that the decline in intermediates trade is too small to support such a conjecture, the *value* of trade in intermediates is influenced by several factors, including commodity prices. An alternative measure of fragmentation that is more closely associated with GVC trade, the share of parts and components in *volume* terms in manufacturing trade, has increased at a moderate pace since the 1990s and has not shown any signs of reversal since the global crisis (Goldberg 2019). Accordingly, the evidence on this point is mixed.

The second argument is that recent technological advances, for example, automation and 3D fabrication, now favor reshoring of economic activity as the production process relies less on low-skill labor than in the past. However, this argument does not withstand scrutiny for three reasons.

First, as the World Bank's (2020) report showed, recent technological advances also create additional scope for trade. Indeed, the evidence to date suggests that those sectors most affected by automation (e.g., the automobile industry) expanded intermediate product imports, especially from developing countries, as the scale of production increased.

Second, as Antràs (2020) has argued, the presence of sunk costs in foreign investments implies that reshoring is not symmetrical to offshoring; even if the incentives to produce abroad may not be as strong today as they were in the 1990s, GVCs will not abandon their activities in other countries given the large sunk costs they have incurred in the past.

Finally, it is conceivable that the advances in modern technology, especially in information and communication technology, lead us in the opposite direction, fostering another wave of globalization, this time driven by trade in services.[12] The increase in remote work and internet-based services and commerce during COVID-19 has contributed to this trend. However, trade in services requires further global integration and regulatory

12. This view is advanced in Baldwin (2019), for instance. Trade in services has indeed grown quickly in recent years, and there is certainly scope for further growth in the future. However, it is important to distinguish between level and direction in this context—in terms of level, there is limited trade in services (compared to goods) at present, even within highly integrated areas such as the European Union. We note also that measuring trade in services poses formidable challenges, so that trends in the data should be interpreted with caution.

convergence across countries, for which there is no appetite now.[13] Which brings us to policy.

POLICY Given that there is no compelling evidence to date that the trend against globalization is technologically driven, policy emerges as the primary explanation. In fact, that set of policies, discussed in section I.B, suggest that the policy environment has changed dramatically since the 1990s and 2000s. But this leads to another question: If deglobalization trends are driven by policy, what explains the change in policy?

Policy in all countries, but especially in democracies, responds to public sentiment. As discussed in the first section, the sentiment vis-à-vis globalization has been gradually changing in the United States since the mid-2010s. There are several reasons responsible for this change that are explored in the next section.

II.C. Phases of Backlash and Causes

There are roughly three phases in the backlash against globalization. The first phase starts in the mid-2010s, when politicians both at the extreme right and extreme left blamed international trade, in particular NAFTA and increasing import penetration by China, for the decline in manufacturing employment and stagnation of real wages in the United States. The sentiment that globalization had become a liability for the domestic labor market was not confined to the United States, as evidenced by Brexit in the United Kingdom and the strong anti-immigration movement in several other European countries. The second phase coincides with the unfolding of the COVID-19 pandemic (2020–2022), which led to additional concerns about trade related to the resilience of global supply chains. The third phase began with the Russian invasion of Ukraine in February 2022 and is centered on yet another concern: national security. The factors contributing to the anti-globalization sentiment in each phase are accordingly specific to each phase.

FINANCIAL CRISIS Given that the financial crisis marks the onset of the trade growth slowdown, it is tempting to attribute the sentiment against

13. For a detailed discussion, see, for instance, Mattoo (2018). The provision of many services requires licensing, but licensing requirements are not harmonized across countries. Even business services, such as banking and insurance, that can be purchased from firms in other countries, often raise delicate regulatory issues, especially regarding the handling of data and privacy. The challenge for policy is to strike a balance between the legitimate use of domestic regulation to protect consumers and its protectionist abuse. Trade policy alone is not enough to make progress in these areas; one also needs regulatory cooperation and coordination.

global markets to the crisis. Indeed, people in different countries were exposed to risks not of their own making that were "imported" from the United States. However, there are several reasons arguing against the hypothesis that the financial crisis was the origin of the anti-globalization sentiment. First, there is the timing. International trade declined sharply during 2008–2009 but recovered immediately afterward. It is not until 2015–2016 that strong arguments against trade and globalization emerge. Of course, one could argue that it took time for people's frustration to build up, but five to six years seems an implausibly long lag. Second, several countries, most importantly China and some in the developing world, fared well during the crisis in terms of growth and poverty reduction, so that the pain felt was by no means universal. For the United States and Europe, Bonomi, Gennaioli, and Tabellini (2021) provide an interesting explanation of why the financial crisis did not lead to a fundamental change in attitudes (including those toward globalization).[14] They argue that it is not economic shocks per se that lead to changes in social attitudes but the interaction of economic shocks with a preexisting divide along cultural lines. The financial crisis may have caused economic hardship, but this hardship was not concentrated in low-education, socially conservative groups that had a preexisting aversion to globalism. However, this was not the case with the next possible cause of the backlash.

IMPORT COMPETITION FROM LOW-WAGE COUNTRIES, ESPECIALLY CHINA As noted earlier, starting in the mid-2010s, several US politicians blamed increasing inequality in the United States, declining manufacturing employment, and stagnation of real wages on imports from low-wage countries, especially from China—the so-called China Shock or China Syndrome. While there is little evidence to support the view that such imports had a major effect on aggregate trends and outcomes in the United States, there is ample evidence by now that they had a large impact on local communities that were disproportionately affected by import competition.[15] These communities fit the profile in Bonomi, Gennaioli, and Tabellini (2021): they consisted of low-income, low-education, socially conservative households who, faced with a major economic shock, became polarized and increasingly economically conservative, rejecting redistribution as well as globalization.

14. This point is also made by Guido Tabellini in his Presidential Address to the Econometric Society in 2022; https://www.youtube.com/watch?v=i6Cp1MIv-Rg&t=2s.

15. See Dorn and Levell (2021) for a discussion of the evidence for the United States and several European countries.

While the change in attitudes was initially confined to these communities, it garnered momentum over time, with trade and globalization becoming major issues in the 2016 electoral campaign. Eventually, this led to the US-China trade war of 2018–2019, a major departure from the earlier trade liberalization policies practiced by the United States. However, even as the trade war was unfolding, it seemed unlikely that this was a permanent change of policy; rather, the policy toward trade and China seemed specific to the choices of a particular administration at the time. Many commentators expected the trade restrictive policies to be reversed once a new administration came to power. This expectation did not materialize, indicating that the change in attitudes toward globalization was more permanent.

CLIMATE CHANGE AND CARBON TAXES With the emergence of climate change as a major challenge facing the world today, globalization has come under fire as a potential contributor to high emissions. The multiple crisscrossing of goods across borders as they are traded within GVCs implies additional packaging and fuel for transportation. Countries have different environmental standards, which may create incentives for pollution havens (though to date there is no evidence supporting this hypothesis).[16] Last but not least, trade is associated with growth, and growth (at least to date) means more pollution. Policies to cope with climate change, including carbon border adjustment taxes, have the potential to lead to a new world order as they will change relative prices with potential implications for countries' competitiveness and comparative advantage. However, the war in Ukraine and the associated energy crisis have put such adjustments on hold. Hence, while climate change could be a major force for rethinking transnational relationships in the future, it has not played this role to date.

COVID-19 AND DEMANDS FOR RESILIENCE Since the onset of the pandemic, a rather novel concern regarding trade has emerged: the resilience of global value or supply chains. Short-run supply shortages of various items, from paper towels and toilet paper to personal protective equipment and ventilators in March 2020 were attributed to the disruption of the normal functioning of GVCs due to COVID-19. Such concerns became even more pronounced toward the end of 2020 and in early 2021, when problems with shipping, delays at ports, and shortages of critical products such as baby formula were featured daily in the press. A chain with multiple links, some of which may be located in different countries, is as strong as the weakest link, some

16. See Shapiro and Walker (2018).

argued. Any time a link in a foreign country breaks due to a local shock, the global supply chain suffers. As a result, the idea that a natural way to increase the resilience of supply chains was to relocate as many links as possible to the domestic economy, that is, to reshore supply chains, gained traction during that time.

This was not the first time that vulnerability of GVCs to local shocks became a cause for concern. Boehm, Flaaen, and Pandalai-Nayar (2019) and Carvalho and others (2021) studied the 2011 earthquake in Japan and showed how this country-specific shock propagated through supply networks to affect firms located in other countries. Barrot and Sauvagnat (2016) studied firm-level idiosyncratic shocks due to natural disasters and found that such shocks affected not only the companies nearby within the region but also their customers who reported declines in sales growth in the medium run. However, neither the Japanese earthquake nor natural disasters led to the sustained criticism of GVCs and denouncing of globalization observed during the pandemic. This is surprising, especially in light of the fact that the COVID-19 shock was not country-specific, but global, weakening the case for reshoring. A natural question then is whether the resilience argument reflects genuine worry as opposed to presenting a novel and convenient excuse for pursuing old-style protectionism motivated by the aforementioned concerns regarding the labor market effects of trade and their potential contribution to domestic inequality.

To address this question, it is necessary to have a well-defined notion of resilience. A useful starting point is the definition provided by Markus Brunnermeier in his recent book, *The Resilient Society*. According to Brunnermeier, resilient means to "bend but not break" in response to a shock (2021, 2). A comparison between the oak and the reed is illuminating. The oak is robust and can withstand many shocks. But if the shock is strong enough, the oak may break. In contrast, the reed is not robust, but it is resilient. Even a light breeze makes it sway back and forth, but when hit with a big storm, it bends, it does not break, and proves therefore more resilient than the oak.

Illuminating as this comparison may be, it still begs the question of how one would operationalize the concept of resilience in economics. A strict interpretation of the "bend but not break" criterion would imply that an economic entity—be it a firm, an industry, an economic relationship, or an entire economy—would be resilient if it survived an economic shock and not resilient if it ceased to exist. A less strict interpretation might be taken to imply that even entities that survive a shock are not resilient if it takes

them a long time to completely recover. But this in turn begs the question of how long is a long time? It is becoming apparent that the concept of resilience raises several questions that remain unanswered in economics to date. Importantly, we lack a well-defined benchmark of resilience by which responses to economic shocks can be judged.

This state of affairs notwithstanding, one can make progress by making explicit some key factors that need to be considered when judging responses to economic shocks. The following outlines relevant considerations:

- Nature and magnitude of shock:
  - Supply, demand, or both[17]
  - Sector-specific, country-specific, or both
  - Idiosyncratic or systemic
- Time horizon (short, medium, or long-run)
  - Dependent on sector (e.g., food, medicines, where time is of the essence)
  - Dependent on (possibly non-homothetic) preferences (e.g., consumers in rich countries without well-developed public transportation may consider a car a necessity)
- Level of aggregation
  - Economy
  - Industry
  - Firm
  - Household

To see why these factors matter, consider first the response to a demand-side shock, for example, a decline in aggregate demand due to rising unemployment or due to health concerns. Whether or not the supply chain is national or global, or well diversified, will matter little for resilience in this case. Now consider the response to a supply shock, for example, a natural disaster or a disease. If the shock is specific to a particular location or country, then diversification of the supply chain to include multiple locations will make it more resilient. On the other hand, if supply shocks are correlated across locations (as is the case with a pandemic, for example), then diversification will do little to increase the supply chain's resilience. Along the same lines, if a supply shock originates in the domestic economy, then reshoring of supply chains will make them less resilient to such a shock. Of course, the opposite would be true if the shock originated abroad. The magnitude of the shock and

17. In practice, it may be hard to separate supply and demand shocks. Guerrieri and others (2020) show how a shock that starts as a supply shock can become a demand shock (COVID-19 is a good example).

relevant time horizon also matter greatly for resilience. For example, the 2011 earthquake in Japan caused severe disruptions in the global automobile industry that lasted for several months after the earthquake. But beyond the automobile industry, the global economy was not much affected, and even the automobile industry eventually recovered. Based on the criterion of "bend but not break," the global economy proved incredibly resilient to this shock.

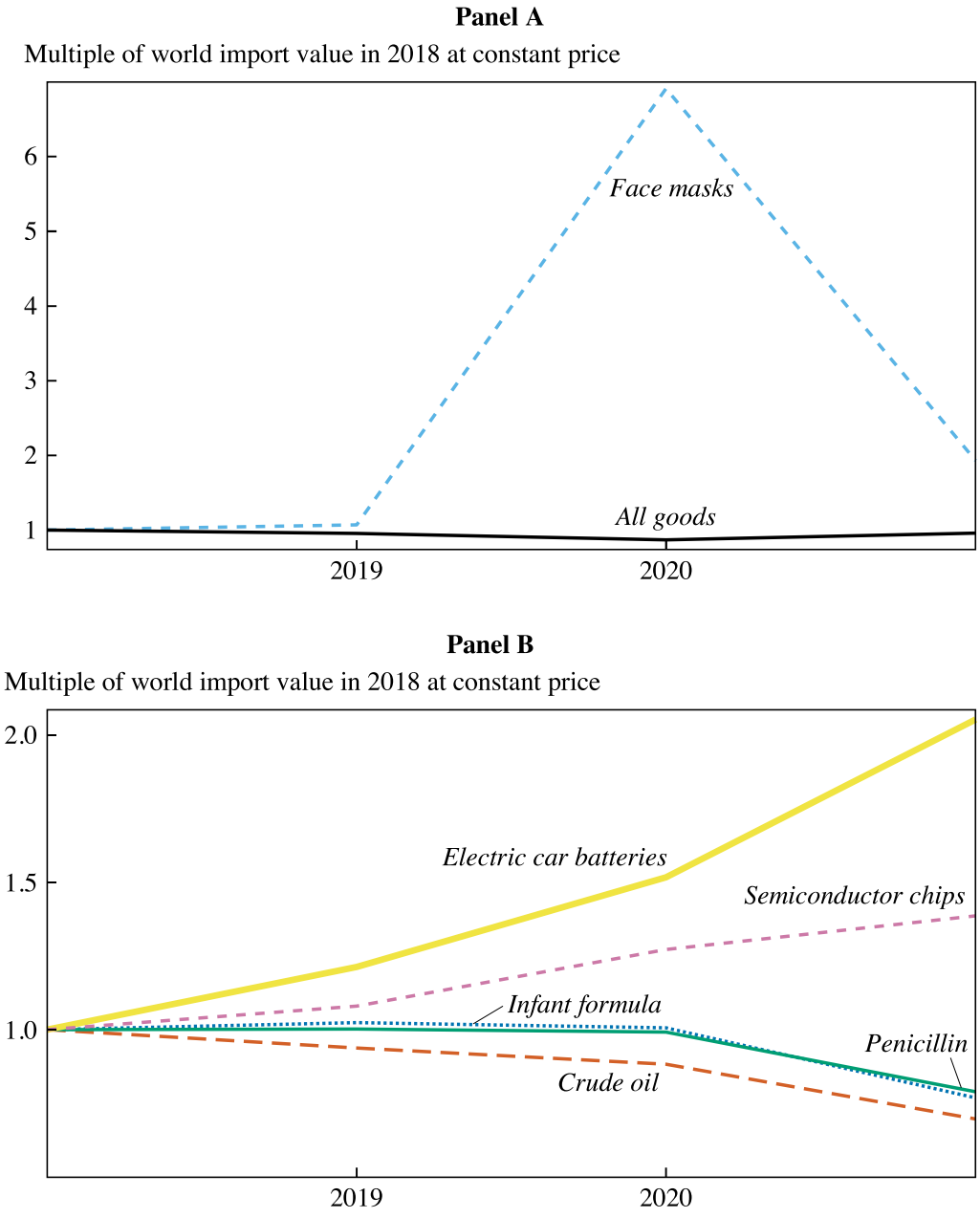
Returning to the COVID-19 pandemic, it is plausibly the largest shock the global economy has faced since World War II. It represented both a demand and a supply shock, as unemployment rose and income dropped sharply during lockdowns, while at the same time, production and commerce ceased in many countries. It affected all sectors of the economy, but some more than others (e.g., hospitality services versus finance or technology). It affected most countries on the globe, but not at the same time, as the infection waves were not synchronized across countries in different continents. In some sectors, such as food and medical products, delivery delays and shortages are critical (i.e., life threatening), while in others, such as autos or semiconductor chips, they are simply inconvenient.

How would one judge the resilience of GVCs and the global economy against this background? While, as noted earlier, we lack an agreed-upon benchmark against which resilience can be measured, we can look at how global trade, both in aggregate terms and in some key products, evolved during the pandemic years, keeping in mind that the pandemic is not completely over yet.

Figure 4 shows world trade flows since 2018 up to 2021, when the most recent COMTRADE data are available. Values are reported as a multiple of the 2018 world import value in constant prices. There was a negligible drop in all goods trade during the pandemic in 2020, and a full recovery in 2021, as seen already in figure 1. Imports of face masks, shown in panel A of figure 4, exhibit an interesting pattern: these imports increased sharply in 2020 reflecting the increasing use of face masks from China and Korea to meet the surge in domestic demand. Not only did international trade not let down the economy in this case, without imports domestic demand for face masks would not have been met by domestic producers. Growth in use of imports to supply electric car batteries and semiconductor chips grew in real terms during the pandemic, with imports of batteries accelerating. Use of imports to supply penicillin, infant formula, and crude oil has declined slightly as of 2021, but supply is not broken.

Khanna, Morales, and Pandalai-Nayar (2022) highlight two additional measures of resilience that can be measured in firm-to-firm transactions: (1) whether it is easy for firms to find new suppliers; and (2) whether firms

Figure 4. During COVID-19 Import Usage Was Bent Not Broken



Sources: COMTRADE and Bureau of Labor Statistics.

Note: World imports of goods are identified with six-digit Harmonized System (HS) codes: face masks (630790), penicillin not packaged for retail (300410), infant formula (190110), crude oil (270900), electric car batteries (850760), and semiconductor chips (854231). Nominal values from COMTRADE are converted to 2018 prices using import price indexes from the Bureau of Labor Statistics. Some indexes match nominal values exactly at the four-digit HS code: crude oil (EIUIP2709), penicillin (EIUIP3004), and semiconductor chips (EIUIP8542). Where such matches are not available in 2018, goods are matched to price indexes at higher levels of aggregation: face masks are matched to instruments and appliances used in medical, surgical, dental, or veterinary sciences (EIUIP9018); electric car batteries are matched to vehicles other than railway or tramway rolling stock, and parts and accessories thereof (EIUIP87); and infant formula is matched to food, beverage, and tobacco preparations (EIUIPIV). Values for all goods are deflated by the US GDP deflator as in figure 1.

maintain links with suppliers. The first measure is summarized, for each firm j and time period t by:

$$Entry\ Rate_{j,t} = \frac{N\ of\ supp.\ to\ j\ in\ t, who\ don't\ supp.\ in\ t-1}{\left[\left(N\ of\ supp.\ to\ j\ in\ t-1\right)+\left(N\ of\ supp.\ to\ j\ in\ t\right)\right]/2},$$

which measures the percentage of suppliers who are new in the current period. A market is resilient if the entry rate does not decrease after a shock. The second measure is summarized by:

$$Separation\ Rate_{j,t} = \frac{N\ of\ supp.\ to\ j\ in\ t-1, who\ don't\ supp.\ in\ t}{\left[\left(N\ of\ supp.\ to\ j\ in\ t-1\right)+\left(N\ of\ supp.\ to\ j\ in\ t\right)\right]/2},$$

which measures the percentage of suppliers from the last period that no longer supply in the current period. A market is resilient if the separation rate does not increase after a shock. A net separation rate may also be measured as:

$$Net\ Separation\ Rate_{j,t} = Separation\ Rate_{j,t} - Entry\ Rate_{j,t},$$

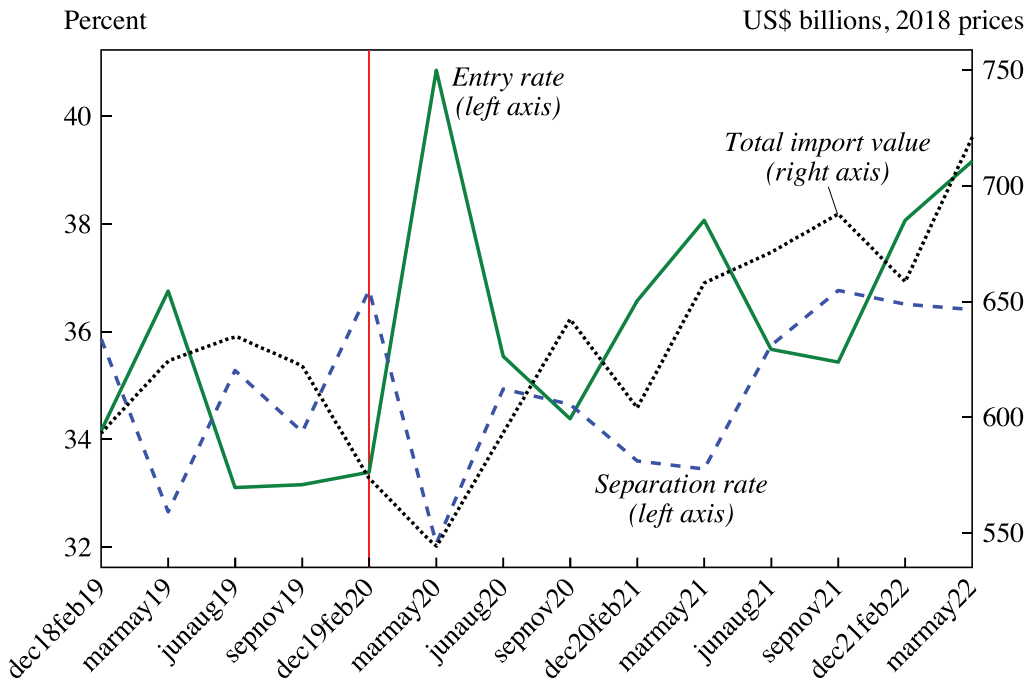
To evaluate the resilience of US supply chains during COVID-19, we construct these measures for US imports. The data source is Panjiva, which compiles the manifests for all container shipments coming into US ports.[18] Though the data do not include trade values, firm identifiers allow us to measure the extensive margin of trade. For each shipment, the data identify the US firm receiving the shipment (consignee) and the foreign firm sending the shipment (shipper).

Figure 5 shows the quarterly averages of the entry and separation rates across all importing firms in the United States during COVID-19 and a year before. Both measures have an average of about 35 percent, as many firms do not receive shipments from the same firms each quarter and receive shipments only once or twice a year.

By these measures, supply chains appear resilient in the quarter of March 2020 to May 2020, the first wave of the pandemic. In that quarter the total value of imports dropped around 13 percent in real terms relative to the same quarter in the previous year, reflecting reduced demand and prices as the country entered lockdown and, potentially, supply reductions

18. S&P Global, "Panjiva Supply Chain Intelligence," https://panjiva.com/.

Figure 5. US Firms' Relationships with Foreign Suppliers during COVID-19



Sources: Panjiva; US Census Bureau; and Bureau of Labor Statistics.

Note: The vertical line indicates the quarter before the COVID-19 pandemic begins. The entry rate measures the percentage of suppliers that are new in the current period, and the separation rate measures the percentage of suppliers from the last period that no longer supply in the current period. Total import value is the value of goods imports (not seasonally adjusted) reported by the US Census Bureau deflated by the import price index for all commodities.

elsewhere.[19] Despite this, the entry rate spiked to 42 percent. The separation rate also fell, as firms held on to previous suppliers. Since entry grew by more than separations, the net separation rate fell. It seems that during the pandemic domestic firms held on to existing relationships with trading partners and even pursued new ones, showing resilience in the context of declining total trade.

An explanation for these patterns is that COVID-19 was a shock to import supply and demand. On the one hand, international suppliers faced lockdowns and curtailed supply. On the other, there was a large reallocation of demand across products, as households scaled purchases of durables in

19. Total import values reported by the US Census Bureau, "Trade in Goods with World, Not Seasonally Adjusted," https://www.census.gov/foreign-trade/balance/c0015.html. In the Panjiva data the volume of container shipments also declines in March to May 2020 relative to March to May 2019.

anticipation of prolonged lockdown and also purchases of health-related goods, like face masks.[20]

To isolate the response of firms to only the supply-side shock, we exploit the time-varying nature of COVID-19 lockdowns across countries. Define the supply-side lockdown exposure of firm j in time t as:

$$Lockdown\ Exposure_{j,t} = \sum_i s_{i,j,t_0} \times \left(Lockdown\ stringency\ in\ country\ i\ at\ time\ t\right),$$

where s_{i,j,t_0} is the share of firm j's import volume (measured in twenty-foot equivalent container units) from country i in t_0, the quarter December 2019 to February 2020, and lockdown stringency in country i at time t is the Oxford University lockdown stringency index (Wade and others 2023).[21] Time intervals are three-month quarters, so the stringency index in each time period is the average for the quarter. Lockdown exposure is zero for all firms prior to March 2020 and then varies across firms and quarters after the pandemic begins.

To isolate responses to this supply side shock we estimate the regression:

$$Net\ Separation\ Rate = \alpha_j + \alpha_t + \beta_1\left(Lockdown\ Exposure_{j,t}\right) + \beta_2\left(Lockdown\ Exposure_{j,t} \times W_j\right) + \epsilon_{j,t},$$

where α_j is a firm fixed effect and α_t is a quarter fixed effect. The quarter fixed effects control for changes in demand in the US economy during the pandemic. W_j stands for alternative firm characteristics hypothesized to shape resilience, namely, the share of import volume (again in twenty-foot equivalent container units) of goods that are differentiated rather than sold on an organized exchange or with reference prices, according to Rauch (1999); the number of suppliers to the firm at t_0; and the total volume of imports at t_0.

Results are reported in table 1. Across all columns, and in contrast to the aggregate pattern in figure 5, supply-side lockdown exposure increases

20. Consistent with this, when replicating figure 5 using only firms importing either face masks or electric car batteries, the spike in entry rates is somewhat larger in the quarter starting March 2020.

21. Our World in Data, "COVID-19: Stringency Index," https://ourworldindata.org/covid-stringency-index.

Table 1. Resilience of US Importers to Supply-Side Shocks

	(1)	*(2)*	*(3)*
Variable	*Net sep. rate*	*Net sep. rate*	*Net sep. rate*
Lockdown exposure [0, 1]	7.14***	5.71***	5.60***
	(0.52)	(0.43)	(0.43)
Lockdown exposure × share differentiated in t_0	−2.02***		
	(0.35)		
Lockdown exposure × Z (number of suppliers in t_0)		3.13***	
		(0.30)	
Lockdown exposure × Z (import volume in t_0)			1.73***
			(0.63)
Number of observations	913,822	913,822	913,822
R^2	0.04	0.04	0.04
Firm fixed effects	Yes	Yes	Yes
Quarter fixed effects	Yes	Yes	Yes

Source: Authors' calculations using separation rate data from Panjiva and lockdown exposure from Oxford University.

Note: Number of suppliers in t_0 and import volume in t_0 are normalized as Z-scores by subtracting off the sample mean and dividing by the standard deviation. Standard errors in parentheses are clustered at the firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

net separations. This confirms that the aggregate pattern of decreasing net separations is explained by demand factors.

There is heterogeneity in responses across firms. Perhaps surprisingly, firms whose imports are more differentiated by the measure of Rauch (1999) have fewer net separations as they maintain relationships even in the presence of a supply shock. In contrast, firms with more suppliers and those with larger overall import volumes experience greater net separations, potentially because they have a greater pool of relationships on which to draw. Khanna, Morales, and Pandalai-Nayar (2022) find similar patterns of heterogeneity when studying the response of firms to supply-side shocks generated by lockdowns in Indian districts. Using firm-to-firm transactions data, similar to those in the Panjiva data but covering also domestic transactions, they exploit the differential exposure of firms in that state to supplier risk during the pandemic. Because the severity of lockdowns differed greatly across Indian states, suppliers located in states with more strict lockdowns experienced a larger disruption. In an event study, they show that firms with suppliers exposed to more-severe lockdowns experienced an increase in net separation rates, a similar result to column 1 of table 1. The intensive margin of trade as measured by the value of inputs and firm output also suffered. They also document that these disruptions were less

severe for supply chains trading more complex products.[22] Though the paper does not attempt to nail down the mechanism behind this somewhat unexpected finding, a plausible explanation is that firms that produce more-complex products value supplier-specific relationships more and take great care to preserve them when faced with uncertainty and disruption.

The importance of relationship-specific investments in global supply chains, and international trade more generally, has been emphasized in the literature.[23] Seen through this lens, it is perhaps not surprising that the US firms that appear in the Panjiva data and trade internationally did not on average sever existing relationships during the pandemic. Furthermore, the additional demand for certain products, for example, face masks or electric batteries, may have led them to seek new trading partners. At any rate, though supply-side shortages due to lockdowns contributed to net separations, overall the extensive margin of trade resulting from the combination of supply and demand forces indicates—contrary to popular claims—strong resilience during the pandemic, as shown in figure 5.

This message is reenforced in a few other papers that explore the economic effects of the pandemic. Stumpner (2022) studies regional lockdowns in China and shows that with the exception of the Shanghai lockdown of April 2022, the other regional disruptions in China due to COVID-19 had no effect on international trade. He concludes that regional lockdowns could still reduce aggregate trade, but only if they were exceptionally stringent and implemented in an economically important province such as Shanghai.

Using data for sixty-four countries, Bonadio and others (2021) document a large contraction of economic activity (an average 29.6 percent drop of GDP) during the pandemic. But only a small fraction of this contraction (about 23 percent) can be attributed to foreign shocks that are intermediated through final and intermediate goods trade. Moreover, simulations based on a global network model indicate that global supply chains alleviated the pandemic-induced contraction: the downturn in the sixty-four countries of their sample would have been worse on average if there were no international trade and supply chains relied on domestic inputs only. The reason is that elimination of foreign inputs would have increased reliance on domestic inputs, which were also affected by the pandemic.

Lastly, looking at world- and country-specific GDP rather than trade reinforces the message of resilience. Clearly, the world economy took a major

22. They use a few alternative measures of complexity: the number of products a particular firm buys from suppliers; the share of total purchases accounted for by differentiated products; and the average number of inputs that are necessary to produce each firm's product.

23. See World Bank (2020) for an overview.

hit with the COVID-19 shock in 2020. But most countries rebounded. World GDP contracted in real terms by –3.2 percent in 2020, but increased 5.9 percent in 2021. The US economy grew on par with global growth in 2021, and the recovery was even faster in several regions according to the World Bank (2023).[24] Even though the pandemic is still not over and many of its effects will be felt for many years to come, the world economy is far from broken. Global growth in 2022 is estimated at 2.9 percent. This is indeed a slowdown relative to the rapid recovery of 2021, but still greater than the 2019 rate of 2.5 percent (World Bank 2021). So, once again, based on the criterion "bend but not break," the world economy proved resilient during the pandemic.

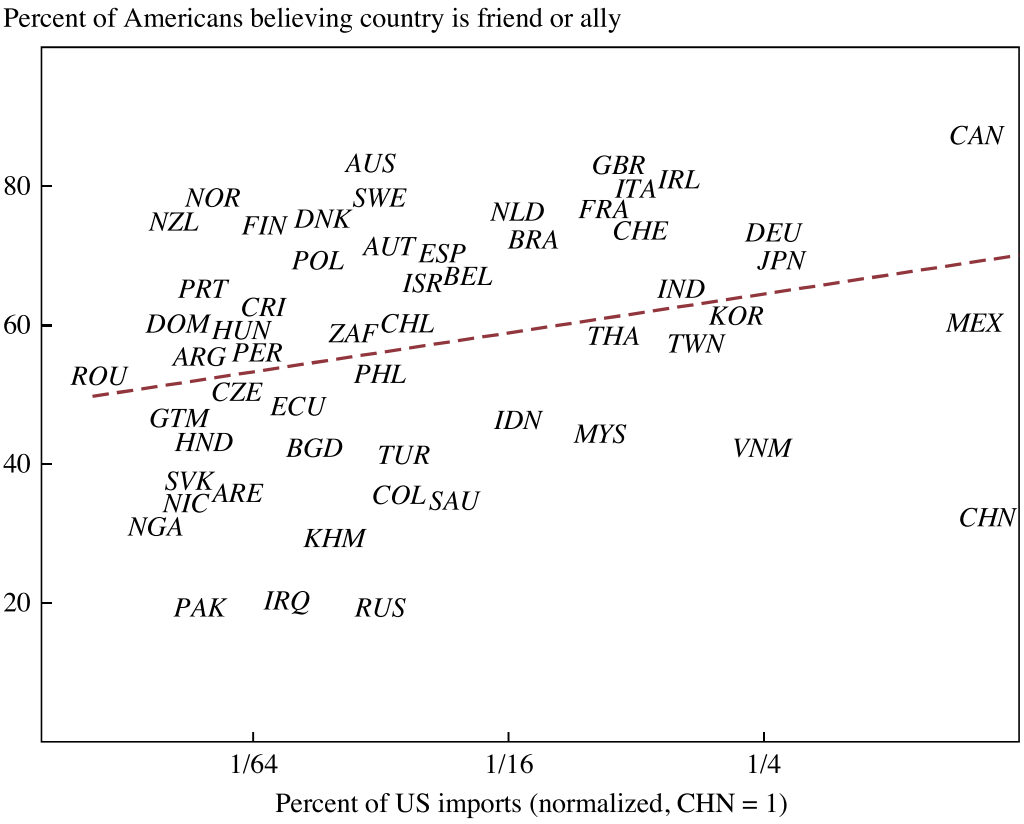
In sum, despite the prominence of resilience concerns in the public debate in the past three years, the evidence to date provides no support either for the view that global supply chains were not resilient during the pandemic or that the world economy would have been more resilient if there had been less dependence on foreign inputs and trade.

INVASION OF UKRAINE AND ENERGY CRISIS The alleged effects of trade as well as COVID-19 on advanced economies' labor markets and inequality supplied many arguments against free trade and globalization, but no single one of them seemed to cause a reversal of attitudes and long-term trends. Nevertheless, these developments might have prepared the ground for what has turned out to be a game changer in the debate and policy on globalization: the quest for resilience, this time not to economic shocks or natural disasters, but to geopolitical turmoil and the emergence of national security as a major reason for rethinking globalism. This is turn fed new demands for reshoring as well as for a rather new concept in trade policy: friendshoring, that is, trading only with, or predominantly with, friendly nations.

The catalyst for this new phase in the deglobalization movement was the invasion of Ukraine by Russia in February 2022, which was followed by a major energy crisis. At this point, the vulnerability of Europe created by relying on a single source (i.e., Russia) for a large share of its energy imports became apparent. The evidence on supply chain resilience during COVID-19 provided by Khanna, Morales, and Pandalai-Nayar (2022) for Indian firms as well as by our results for US firms suggests that the private sector had taken steps to cope with exogenous shocks, at least in those cases where disruptions would be expected to have severe economic

24. In 2021, real GDP growth in the United States was 5.9 percent, but 7.9 percent in South Asia, 7.2 percent in East Asia and the Pacific, and 6.7 percent in Eastern Europe and Central Asia.

Figure 6. America Is Already Friendshoring



Sources: YouGov (2017) and US Census Bureau.

Note: Countries are classified as unfriendly if less than 50 percent of Americans believe the country is a friend or ally. Figure includes only countries with greater than 0.1 of US imports in 2022. The slope of the dashed line is 4.04 (SE = 1.87).

implications due to relation-specific investments. But the experience with Russia revealed that at least Europe was ill-prepared to deal with disruptions due to major geopolitical shocks. The concerns about Europe and Russia have led—by extrapolation—to more general concerns about the resilience of global supply chains to geopolitical risks and to demands to fundamentally reorganize international relationships, so as to decouple from any country that is perceived as unfriendly by the United States. China tops the list.

A natural question in this context is whether, beyond specific instances of government-led sanctions, market forces have led countries already to orient themselves toward trading with friends. In figure 6 we evaluate whether the United States is in fact friendshoring by relating the import share of a country in 2022 to the percentage of Americans believing the

country is a friend or ally in the most recent poll by YouGov (2017). For many trading partners, a majority of Americans believe the country is a friend, and there is a positive and statistically significant association between this variable and a country's share of imports. China, the largest trading partner, is in fact an outlier, with just 26 percent of Americans believing it is friendly and 6 percent believing it is an ally.

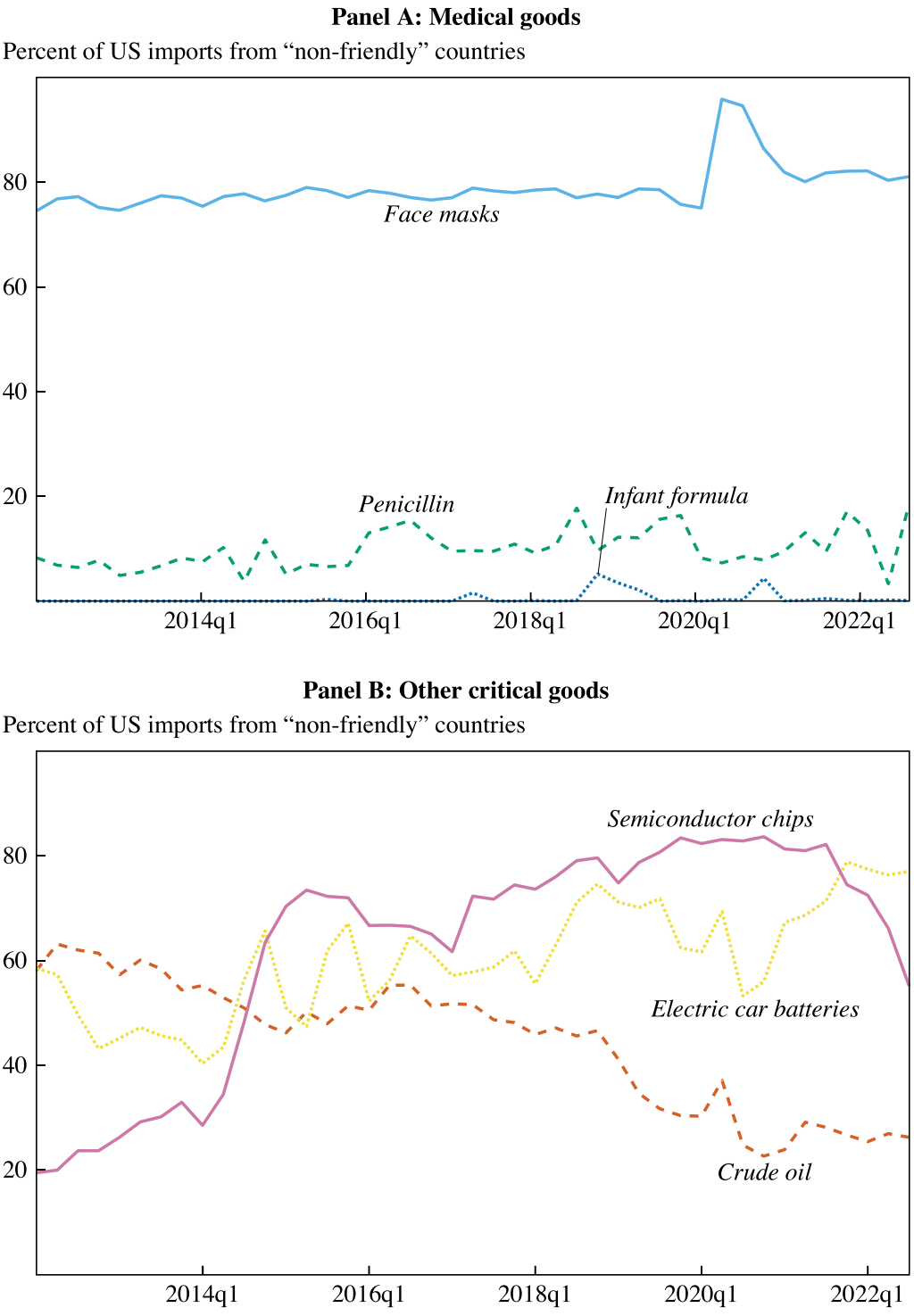
The survey data reveal the limits of friendship as an organizing principle for trade. For many countries, Americans participating in the YouGov survey respond that they are unsure whether the country is an ally, friend, unfriendly, or an enemy. Indonesia, Malaysia, and Vietnam are all important sources of imports, including semiconductors, but less than 50 percent of Americans believe they are a friend or ally. There is a pro-European bias to surety, with, for instance, Japan ranking below Germany despite nearly identical import shares.

Though the aggregate import data suggest an already high degree of friendshoring in the United States, it is possible that high dependence on non-friendly nations for the import of some critical products makes the United States vulnerable to geopolitical risks (as was the case with Europe and energy import from Russia, for example). For this reason, we focus on some high-profile products next. These products are considered critical either for health and nutrition reasons or because they represent important inputs in the production processes of a modern economy. Figure 7 reports, for health (panel A) and other strategic goods (panel B), the share of US imports coming from countries where less than 50 percent of Americans believe the country is a friend or ally, or non-friendly countries, measured in 2017. We hold the classification of countries constant to illustrate dynamics in import shares. There are several observations.

First, in the category of health products, face masks, of which 73 percent came from China in 2022, is an outlier in terms of reliance on non-friendly countries. Non-friendly countries provide less than 20 percent of penicillin imports and less than 5 percent of infant formula imports. Evenett (2020) makes a similar point in his study of pre-pandemic international sourcing patterns of medical goods and medicines for France, Germany, the United Kingdom, and the United States.

Second, as noted earlier, in the case of face masks, imports from China provided important relief and increased resilience during the pandemic. Note the spike of imports from non-friendly nations during the second quarter of 2020 in figure 7. Hence, decoupling from unfriendly nations may increase resilience to specific geopolitical shocks but decrease resilience to

Figure 7. Most US Imports of Several Strategic Goods Come from Non-friendly Countries



Sources: YouGov (2017) and US Census Bureau.

Note: Countries are classified as non-friendly if less than 50 percent of Americans believe the country is a friend or ally. Imports are identified with six-digit Harmonized System (HS) codes: face masks (630790), penicillin not packaged for retail (300410), infant formula (190110), crude oil (270900), electric car batteries (850760), and semiconductor chips (854231).

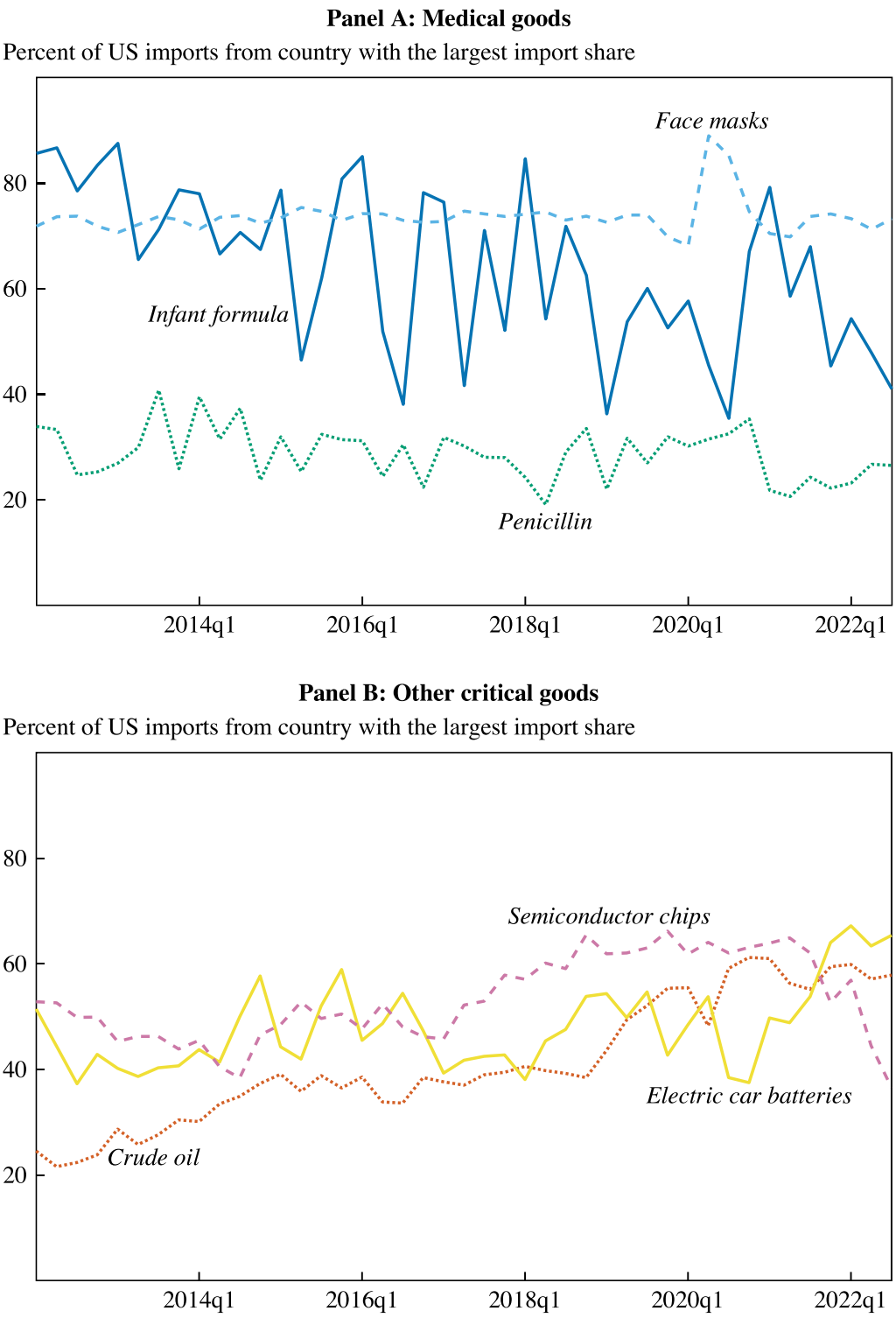
other shocks unrelated to politics. The general point is that it is impossible to think about resilience without specific reference to the type of shock to which resilience is sought.

Third, panel B of figure 7 shows how import dependence on non-friendly nations has evolved in the past decade for some strategic goods. The sharp increase in the case of semiconductor chips reflects the rising popularity of the foundry model in the past two decades, with many foundries located in Malaysia, Vietnam, and China (see table A1 in the online appendix)—countries that are perceived as non-friendly by a majority of Americans in the YouGov survey. Similarly, in the case of electric batteries, the growing dependence on China is evident in the figure. However, import shares for some goods appear responsive to policy. The share of crude oil sourced from non-friendly countries has fallen from 60 percent to about 20 percent, as the shale boom made the United States a petroleum exporter. Although in 2020 about 80 percent of semiconductor chips were imported from non-friendly countries, in 2022, during which the United States articulated a friendshoring policy with regard to the sector, this share had fallen dramatically to about 55 percent. This reflects growth in the import share of Taiwan from 5 percent to 10 percent; Ireland, from 2 percent to 8 percent; and Israel, from 1 percent to 4 percent.

Dependence on non-friendly countries is only one among several possible factors affecting supply chain resilience. High concentration in the market of a specific product will in general imply high dependence of buyers on suppliers, making this market less resilient to supplier-side risk—be it risk associated with exogenous shocks (e.g., natural disasters) or risk arising from the exercise of supplier market power. Given that friendship is a volatile concept (ironically, two of the countries viewed as friends of the United States today, Germany and Japan, were its main enemies during World War II), resilience in its broadest form implies availability of multiple alternatives for sourcing a product and low concentration.

Figure 8 and table A1 in the online appendix show how concentrated the markets for the above strategic product imports are in the United States. Concentration can signal a lack of resilience because it implies fewer alternatives to choose from if one supplier fails or if demand increases unexpectedly. Figure 8 reports the percentage of US imports from the country with the largest import share in each product category, and table A1 shows the import shares of the five largest importers in each case. By these measures, some goods markets appear less resilient than when viewed through the lens of supply by friendly countries. Approximately 75 percent of infant formula comes from two countries, Ireland (45 percent) and Mexico

Figure 8. Markets for Imports Are Highly Concentrated



Source: US Census Bureau.

Note: Imports are identified with six-digit Harmonized System (HS) codes: face masks (630790), penicillin not packaged for retail (300410), infant formula (190110), crude oil (270900), electric car batteries (850760), and semiconductor chips (854231).

(30 percent). This concentration is due to differences in market access: Ireland and Mexico have duty-free access through free trade agreements, whereas most other countries are subject to a tariff of 14.9 percent to 17.5 percent depending on the content of the formula (Casey 2022). Stringent labeling and food safety requirements, which are not harmonized with those required by regulators in Europe, further restrict imports (Casey 2022). Similarly, in the case of crude oil, about 70 percent of US imports in 2022 came from two (friendly) countries, Canada and Mexico. The main takeaway from these data is that key product markets in US imports are highly concentrated. Given that the main suppliers in most of these markets are friendly countries, this state of affairs does not imply vulnerability to geopolitical risk—at present! But it does imply vulnerability to other country-specific risks as well as to a potential change in international relations in the future.

Measures of import market concentration are of course imperfect proxies of resilience. Ideally, one would like to know elasticities of substitution and export supply and import demand elasticities at a highly disaggregate level to assess a product market's resilience to a shock. For instance, in the case of a demand shock (say, an increase in the import demand for face masks due to COVID-19), a market would be characterized as resilient if the export supply of face masks by the rest of the world were highly elastic. And similarly, in the case of a supply shock (say, a decrease in supply of inputs due to a lockdown), a market would be considered as resilient if the import demand were highly elastic. Export supply and import demand elasticities are notoriously difficult to estimate credibly. Fajgelbaum and others (2020) use the tariff variation induced by the recent trade war between the United States and China to estimate these elasticities at the HS-10 level of aggregation. Interestingly, they cannot reject the hypothesis that the export supply curve facing the United States is infinitely elastic. Similarly, they cannot reject that the export supply curve of the United States facing foreign trade partners is infinitely elastic. Taken at face value, the elasticities imply high resilience to demand-side shocks.

However, these elasticities are measured at a level of aggregation that may still be too high for judging a sector's resilience. The vulnerabilities that are often cause for concern play out at a much more disaggregate level. Consider semiconductors for instance. According to table A1 in the online appendix, Taiwan has only around a 10 percent share in US semiconductor chip imports. However, as a joint report by the Boston Consulting Group and Semiconductor Industry Association shows, Taiwan dominates the market for logic chips in the advanced nodes (10 nanometers or below),

which are required for compute-intensive devices and smartphones (Varas and others 2021). If the production technology in these products follows Leontief, then there will be no substitutes for these highly specialized chips made in Taiwan. Industry reports suggest that this is indeed the case. But obtaining credible estimates of substitution elasticities at that level of disaggregation has been elusive so far. Future micro-oriented research might be able to make progress on this front.

Along the same lines, our discussion so far has focused on resilience as it relates to imports—given that this paper is about deglobalization and the forces that are shaping it. But resilience of supply chains depends as much on domestic market structure and competition as on international factors. For example, an industry that sources its inputs from a single domestic supplier might be plausibly sheltered from geopolitical risk but would have little resilience to other shocks. A complete assessment of resilience therefore requires careful modeling of the entire industry under consideration, taking into account both domestic and international firm-to-firm relationships. This could be another area for policy-relevant micro research in the future.

In general, the evidence to date does not suggest any strong dependence of the United States on imports from non-friendly countries—on average—though there is dependence is some critical sectors. However, even in these sectors, the recent experience with COVID-19 suggests that countries regarded as non-friendly alleviated rather than caused critical bottlenecks. In addition, it seems that the private sector, even without government intervention, has been slowly decoupling from non-friendly countries in recent years, especially in semiconductors and crude oil. However, imports of critical products are highly concentrated among a few countries. Independent of geopolitical risk, this is a cause for concern as it suggests potential vulnerabilities to idiosyncratic supplier-side risk.

DUAL-USE GOODS AND CONCERNS ABOUT NATIONAL SECURITY The national security argument is not new. It was initially deployed by the Trump administration to impose tariffs on aluminum and steel, and subsequently endorsed by the Biden administration, which declared these tariffs were nonnegotiable. As discussed earlier, it has also been invoked to justify policies encouraging decoupling from non-friendly nations in the imports of critical products in order to make their supply resilient to geopolitical risk. But it has reached new significance since the last quarter of 2022 when it was employed proactively to stop non-friendly countries, China specifically, from developing military capabilities by exploiting trade with the United States to their advantage. The cornerstone of this argument is the increasing importance

of "dual-use goods," that is, goods that have both civilian and military uses. A complete list of such products can be found in Singapore, where under the Strategic Goods (Control) Act permits are required for transshipment of dual-use goods.[25] The list of dual-use goods is vast, including aluminum and steel alloys above a certain tensile strength, semiconductor chips, and machine tools.

The main category targeted to date is the semiconductor sector. Semiconductors are an integral component of various consumer products, such as cars and smartphones, but are also used in dual-use goods, such as civilian and military aircraft. Moreover, they are used in supercomputing and artificial intelligence, fields that have potential national security implications. Motivated by these considerations, the United States in October 2022 announced sweeping export controls in the semiconductor industry targeting China. The United States does not export many semiconductor products directly to China. However, the export controls targeted third-country chip manufacturers who use US software or US machines in their manufacturing facilities. According to the restrictions, any semiconductor made with US technology for use in supercomputing or artificial intelligence can be sold to China only with an export license issued by the United States, which will be difficult to obtain. Given that almost every semiconductor is produced using US technology, this rule effectively covers the entire global industry. Third-country producers had no say in the matter. They have two choices at this point: either obtain the required export licenses by the United States or cease to use US technology and equipment. Hence, the use of the phrase "weaponized interdependence" to characterize how the United States has used the interdependence inherent in trade and global supply chains to force its trade partners to go along with its economic war against China. In addition, the United States barred its citizens from working with Chinese chip producers except with specific approval. With these measures the United States is seeking to prevent China from advancing technologically in sectors that are crucial to national security.

Interestingly, none of these restrictions were the result of lobbying efforts by the domestic or global semiconductor industry (in fact, the semiconductor industry has become so globally interconnected that it is one of the strongest advocates of free trade). They were decided top-down by the US government based on concerns about the increasing militarization of China and military applications of dual-use goods. The global semiconductor industry

25. Singapore Customs, "List of Dual-Use Goods," https://www.customs.gov.sg/businesses/strategic-goods-control/strategic-goods-control-list/list-of-dual-use-goods/.

was asked to adjust or lose access to US technology. To the extent that these new policies contribute to deglobalization today, it is fair to say that deglobalization is not market-driven; rather, it is the result of government-led actions and policies that had little support, at least initially, from the private sector.

Taken at face value, national security is the most powerful argument against unconstrained, market-driven globalization to date. It is also the most problematic as it cannot be verified directly by researchers, market analysts, or journalists—one has to place faith in the government's intelligence sources. Nevertheless, the argument has found bipartisan support in the United States. Furthermore, a broad interpretation of "dual use" might lead to many goods facing restrictions—including clothing or medicines used by the military. Accordingly, it has the potential to lead to broad, sweeping restrictions in several sectors and a major economic war if China retaliates. An alternative interpretation of the recent export restrictions in semiconductors is that they have little to do with national security but aim instead to contain China's economic development, as the United States has realized that industrial policy alone will not be sufficient to outcompete China in the future.[26] If this is the case, the new restrictions mark the end of an era of globalism and economic cooperation and the onset of another cold war.

III. Consequences

We conclude with some thoughts about the potential consequences of gradual deglobalization. Given that, as shown in section I, deglobalization is not showing in the data yet but is nevertheless plausible given recently adopted policies, any statements about its likely effects in the future are highly speculative.

In the short and medium run, one would not expect any dramatic effects as the world economy is slowly transitioning to a new state. One should also distinguish between level and direction of change. The level of globalization remains extremely high by historical standards, though the direction of change is toward deglobalization. As global supply chains are reorganized

26. See Sullivan (2022): "On export controls, we have to revisit the longstanding premise of maintaining 'relative' advantages over competitors in certain key technologies. We previously maintained a 'sliding scale' approach that said we need to stay only a couple of generations ahead. That is not the strategic environment we are in today. Given the foundational nature of certain technologies, such as advanced logic and memory chips, we must maintain as large of a lead as possible" (pars. 43–45).

across the world, a new international economic system may emerge, one that relies heavily on bilateral and regional agreements as well as partnerships among friends. This process may create opportunities for countries that are well positioned to take advantage of this new economic environment.[27] But even though trade will likely survive new geopolitical tensions, the consequences of the newly emerging economic system on the global economy may turn out to be more severe in the long run.

III.A. Resilience

Given that many of the recent policy restrictions were motivated by the quest for resilience, be it resilience to natural and economic shocks or resilience to geopolitical risk, it is natural to ask whether the new system envisioned by policymakers would make the economy more resilient. As emphasized throughout this paper, this question is impossible to answer without a well-defined metric of resilience. Developing such a metric requires value judgments by our society; it is not simply an economic question. For instance, ongoing work by Carvalho, Elliott, and Spray (n.d.) makes progress on this conceptual challenge by defining a closely related concept: that of a firm being "essential" in a case where "demand for key goods at current prices cannot be met without that firm producing . . . i.e., there is no way of re-routing demand through the supply network such that other firms can take up the slack" (1, 4). This is a useful starting point, but it still leaves open the question of what "key goods" are. From the point of view of some US consumers, a new car of the latest model year might be a key good. Similarly, if one focuses on the total output of the economy, the question becomes how large a decline to a major shock (such as COVID-19) is a society willing to tolerate.

These qualifications notwithstanding, reviewing the theoretical arguments and evidence to date suggests that future resilience—no matter how exactly this is defined—could go either way.

On the theory side, recent work by Elliott, Golub, and Leduc (2022) shows how modern production networks create the potential for critical bottlenecks. Private optimization is not sufficient to avoid severe disruptions, so there is scope for intervention by a social planner. In this context, reshoring in critical sectors is potentially justified.

On the empirical side, the evidence is mixed. As discussed earlier, existing supply chains in almost all sectors proved resilient to the pandemic.

27. See, for example, the response to the US-China trade war documented in Fajgelbaum and others (2022).

But energy supply in Europe turned out to be highly vulnerable during the Ukraine war. In general, as emphasized earlier, resilience cannot be judged without reference to specific shocks. Caselli and others (2020) make this point forcefully when considering the question of whether international trade makes a country more or less resilient (i.e., in the sense of being exposed to volatility) to shocks. As they point out, the answer depends on whether the shocks are sector-specific or countrywide. A common view is that trade makes countries more vulnerable to shocks, as trade encourages specialization that implies high exposure to sector-specific shocks. However, when countrywide shocks are important, international trade may make a country more resilient by reducing its exposure to domestic shocks. Using a quantitative model of trade, they find that in recent decades the second type of shock dominates, so that international trade has reduced economic volatility for most countries. The evidence reviewed in section II pertaining to COVID-19, a shock that was not just countrywide but global—however, not synchronized across countries—reinforces this view.

In short, unless a sector is highly dependent on a single import source (as is the case with the dependence of the energy sector in Europe on Russia), international trade seems to contribute to resilience, not compromise it. Hence, it is unlikely that trade restrictions will improve countries' resilience.

III.B. Efficiency, Innovation, and Long-Term Growth

It may be hard to clearly identify the causal effects of global supply chains and openness on efficiency and growth through econometric studies, but the consensus is that many of the features that characterize modern trade, such as hyper-specialization, firm-to-firm relationships, and technology and knowledge transfer across firms and countries, played a crucial role in promoting growth and technological progress over the past three decades. The stagnation, if not reversal, of the open policies of the past by the United States, which more than anyone else had embraced them, naturally raises questions about the future of growth and innovation under the new regime. The recent export restrictions in semiconductors represent a major blow to the technological advancement of China (as intended), at least in the short run. How China will cope remains to be seen. The hope of the United States is that the same policies aimed at containing China, combined with well-thought-out industrial policy, could spur a new wave of growth and innovation in the United States. But industrial policy has a mixed record, and it remains to be seen whether its recent incarnation will prove beneficial to the US economy in the long run. Further, a slowdown in Chinese growth and innovation could slow the United States and global economy.

Although the future is highly uncertain in this changing landscape, there are reasons to be concerned about future growth prospects. In a study completed in 2021, well before the sweeping export restrictions targeting China were put in place, the US Chamber of Commerce issued a report studying the aggregate costs of a potential US-China decoupling as well as its industry impacts (US Chamber of Commerce 2021). The report concluded that the costs would be uncomfortably high; for instance, abstracting from other measures, a 25 percent tariff applied to all two-way trade would imply an annual GDP loss for the United States on the order of $190 billion by 2025. The aggregate effects would be orders of magnitude larger if one considered restrictions on investment, people, and the flow of ideas. The impacts on specific industries such as aviation, semiconductors, chemicals, and medical devices would also be substantial over the next decade.[28]

Along the same lines, a recent paper by Thun and others (2022) introduces a new concept, "massive modularity," that characterizes many production processes today; they argue that the presence of massive modularity makes it extremely hard to decouple, reshore, and generally reorganize economic activity across borders. Massive modular systems involve several modules that are interconnected with each other, can experience innovation independent of each other, and can be broken into smaller, more specialized modules, each of which can again experience independent innovation. Different firms, located in different countries, specialize in different modules, making production structures extremely complex. For example, the CEO of Pfizer once stated that the company's COVID-19 vaccine "requires 280 different materials and components that are sourced from 19 countries around the world" (Breuninger 2021, par. 5). The vast complexity of modern production poses a challenge for policy as measures aimed at reducing risk or promoting domestic industries may have unintended consequences. In general, rebuilding massively modular industries in all their complexity on a national level is a Herculean task. Even if it doesn't fail, it will certainly take many years to accomplish. Given that the sectors characterized by this high complexity are precisely those sectors that are key to innovation and growth, this effort will likely slow down growth in the United States and global economy.

Decoupling between the United States and China in particular also threatens the pace of global innovation. Most models of long-term growth

28. In aggregate, IMF researchers estimate losses on the order of 8–12 percent in some economies once technological decoupling is considered (Aiyar and others 2023).

emphasize the role of population in research and development.[29] With over 1.4 billion people, China is expected to have a lot of new ideas and develop advantages. For example, China is a global leader in 5G communications technology and consistently files more artificial intelligence patents than any other country (Li, Tong, and Xiao 2021). Xie and Freeman (2019) attribute 37 percent of global citations to scientific articles written by Chinese researchers. Though citations are an imperfect measure of innovation, the scale is unquestionable. Moreover, a significant amount of this research has been done with American coauthors.[30] As political tensions have increased, this scientific collaboration has come under scrutiny. In 2018, the US Justice Department China Initiative began investigating US-based scientists under suspicion of intellectual property theft on behalf of the Chinese government, and the US National Institutes of Health began investigating hundreds of scientists for nondisclosure of research funds from China. Jia and others (2022) show that around this time, there was a marked decline in publications by and citations of scientists with previous collaborations with scientists in China, even if these scientists were not themselves subject to investigations. US-based scientists of Chinese heritage were hit hardest. In interviews, scientists cited new administrative oversight, including frequent consultation with their university's administration to navigate regulations about collaboration, and a feeling that they had to choose between access to US research dollars and their collaborations with scientists in China.

While US authorities have legitimate reasons to enforce intellectual property rights over commercialized technology developed at private firms, the type of pre-commercial basic research done at universities is often done without an expectation of patent. Indeed, many university scientists are not motivated by profit and recognize that their research is most beneficial when it disseminates quickly and can be built on by other scientists. As Chinese science continues to advance even under US export restrictions, barriers to interaction between US scientists and Chinese scientists could plausibly retard innovation in the United States.

III.C. Inflation

Inflation emerged as a major concern in 2021. No one claims that the recent increases in prices are due to trade restrictions. The US-China trade war may have increased the prices of targeted products but it had small

29. See, for example, Kremer (1993).

30. Along the same lines, US universities enrolled 129,440 Chinese graduate students in 2018–2019 (Feldgoise and Zwetsloot 2020).

effects on the US Consumer Price Index.[31] However, one of the main presumed benefits of open trade is its effects on lowering consumer prices. The low inflation the United States and many other advanced economies enjoyed in the past two decades, despite aggressive monetary policies, is in part due to globalization. International sourcing allowed firms to reduce their costs, and even though these cost reductions were not always passed through to consumers in the form of lower prices, so that many firms increased their profit margins, international competition kept price increases in check.[32] On the labor side, unions and workers in general had little bargaining power when their jobs could be outsourced to low-wage destinations (or to machines and robots). One may lament the effects that globalization and technology may have had on the American worker, but the flipside of these forces is that they kept prices low for consumers. If, in the new era, product and labor markets are shielded from foreign competition in the form of trade or immigration, the price of work and goods will rise. This is especially relevant in a period characterized by labor and other supply chain shortages.

III.D. Within-Country Inequality

On the other hand, the empowering of the American worker has been one of the stated objectives of the new stance toward globalization in the United States. The question then is, Will deglobalization halt and possibly reverse the rising inequality that emerged during the era of hyper-globalization? As the *Deaton Review* argues, inequality is a complex phenomenon with many dimensions—social, political, and economic—so that there is no simple answer to this question. However, the experience of the past two years should give one pause. In the United States, nominal median weekly earnings went up by 10 percent from January 2021 to December 2022. But due to 14 percent inflation, real wages actually declined by 4 percentage points.[33] Although factors other than deglobalization could be responsible for this trend, one thing that is certain is that the American worker was not better off in 2022 compared to past years.

31. Studies of the price effects of the trade war find complete pass-through of the tariff increases on import prices, though consumer prices were less affected. See Fajgelbaum and others (2020) and Cavallo and others (2021).

32. See De Loecker and others (2016) for a discussion of pass-through of cost reductions on prices.

33. Weekly earnings are median usual weekly real earnings for wage and salary workers employed full time, age 16 years and over, and inflation is the Consumer Price Index for all urban consumers, both reported by the Federal Reserve Bank of St. Louis.

III.E. Global Inequality

The effects of potential deglobalization on global inequality might be easier to determine. The past three decades saw a sharp reduction of global poverty, driven primarily by the growth of East Asia, and a decline in global inequality.[34] Though many factors contributed to these developments, the consensus among economists is that the opening of long-closed borders, the growth of trade between countries, and the establishment of the modern global trading system played an important role.

Such progress seems less likely in a future deglobalizing world where advanced countries are turning inward. Large developing countries, such as India, may still find a way forward if they implement appropriate policies by relying on their own large domestic markets and by taking advantage of the void left by the United States decoupling from China to advance their economic integration with the rest of the world. However, the lessons learned from trading with China will not be forgotten in advanced economies; India could expect to encounter a less friendly reception in the United States if its low-wage labor represented a threat to US labor markets or if it grew to the point that it threatened the technological dominance of the United States.

For smaller, low-income countries the prospects are much bleaker. Without access to lucrative foreign markets, there is no clear path for such economies toward growth, poverty reduction, and development, as Goldberg and Reed (2023) show. Increasing emphasis on environmental and labor standards as well as product regulation (such as sanitary and phytosanitary standards) raise entry barriers for poorer countries and may lead an increasing share of trade to be within the set of high-income countries that can comply, rather than between high-income and low-income countries.

Policies to fight climate change may further contribute to divergence between advanced and developing countries. If, for instance, countries sharing similar interests and characteristics (e.g., the prosperous economies of G7, or North America, or Europe) form climate clubs, then countries like India with high emission levels may find themselves excluded and potentially facing punitive tariffs.

III.F. Peace

A final, long-run consideration regards the effects of deglobalization on peace. Indeed, one of the strongest motivations for free trade has been the belief that it promotes peace and political stability. The predecessor of the

34. See Goldberg and Larson (2023) for a discussion of these trends.

European Economic Community, the European Coal and Steel Community, for instance, was designed with the explicit goal to assist the economy of Europe and prevent future war by integrating its members.

An influential paper by Martin, Mayer, and Thoenig (2008) argues that this conventional wisdom is only partially true and depends crucially on whether trade is bilateral or multilateral in nature. Bilateral trade increases the opportunity cost associated with the loss of trade between two countries and makes them therefore less likely to engage in war. In contrast, multilateral trade decreases bilateral dependence to any given country and thus the cost of bilateral conflict, making countries more likely to end up in war. The recent war in Ukraine and Russia's reliance on China to survive the trade disruption caused by sanctions imposed by the West fit this paradigm.

On the other hand, one might counter that in the case of Ukraine multilateralism had been severely compromised prior to the war and that it was in fact fractures in the world trading system that ultimately enabled the invasion of Ukraine. For instance, one might wonder if China would have been willing to provide a lifeline to Russia if its economic relationship with the West had not deteriorated so much in the past four years. The decline of multilateralism may not be evident in the trade data yet, though trade between the United States and China has declined following the trade war between these two countries. But trade data may take some time to adjust to reflect changes in attitudes and political climate that contribute to armed conflict.

The period leading up to World War II provides a case in point. De Bromhead and others (2019) study interwar trade and show that in the 1930s there was a dramatic shift away from multilateral trade toward trade within empires or informal spheres of influence. For instance, the British Empire accounted for around 30 percent of UK imports in 1929, but almost 42 percent by 1938. Several observers have argued that this changing nature of trade not only reflected, but potentially exacerbated, the international tensions of that period, an era now known as "pre-belligerency" (de Bromhead and others 2019). The changing nature of globalization in the past five years bears an eerie resemblance to that time.

IV. Conclusion

The future of globalization is highly uncertain at this point. But one thing is certain: there is no longer support for market-driven, unbridled globalization. Governments are now investing to reallocate international supply chains from a free market equilibrium. A challenge in this new era is that

such investments are motivated by objectives that are hard for researchers and the public to evaluate. When globalization was motivated primarily by the objective of economic efficiency, aggregate welfare benefits and distributional effects could be quantified through the lens of economic models. In contrast, there is not yet a quantitative benchmark for how much resilience is optimal. National security threats and their diminution can be difficult to verify without security clearance. Researchers can make progress by developing tools to evaluate the impacts of trade and industrial policy on these outcomes that are now guiding policymakers.

No matter what form globalization takes in the future, great care will have to be taken to address its potential effects on within-country inequality in advanced economies, the risks associated with high import concentration in critical product markets, and national security concerns. Whether industrial policy and trade restrictions aimed at containing China's technological development will accomplish this remains to be seen.

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Comments and Discussion

COMMENT BY

POL ANTRÀS John Kenneth Galbraith once stated that "the only function of economic forecasting is to make astrology look respectable" (*Economist* 2016, par. 1). I am certainly more bullish than Galbraith was about the power of economics in delineating possible scenarios for the future of the world economy. But his irreverent assertion is a useful reminder that anything that is written on the future of globalization is necessarily speculative in nature. Although Goldberg and Reed's paper is no exception, their analysis constitutes an informed type of speculation, and a good illustration of the difference between a social science (economics) and a pseudo-science (astrology).

Goldberg and Reed make three main points in their article. First, they argue that the world economy does not appear to be deglobalizing; the hyperglobalization of the late 1980s, 1990s, and early 2010s has given way to a new era of "slowbalization," but there is little indication that globalization is in retreat. Second, and focusing on the recent COVID-19 pandemic, they show that global trade was remarkably resilient in the face of a drastic challenge to the functioning of the global economy. Finally, the authors identify a recent significant change in the policy environment and in public sentiment, particularly after Russia's invasion of Ukraine, a change that foretells a highly uncertain future for globalization, including scenarios reminiscent of the 1930s.

It will be no surprise to the authors, who have read and generously cite my own work on this topic (Antràs 2021), that I am largely in agreement with their main points. Regarding their first point about the lack of evidence for deglobalization, I am reminded of Robert Solow's famous

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remark that "you can see the computer age everywhere but in the productivity statistics" (Solow 1987, par. 7). Similarly, one might say that you can see the deglobalization age everywhere but in international trade statistics. Unlike the case of Solow's productivity paradox, however, the disconnect between the widespread deglobalization rhetoric and actual data is not due to mismeasurement: as of today, the world is simply not deglobalizing. Furthermore, I also concur with the authors in their assessment that slowbalization has largely been caused by the growth of two giant economies, China and India, which have developed domestic capabilities that have allowed them to produce goods with less reliance on foreign intermediate inputs, thereby putting downward pressure on the ratio of world trade to world GDP.

Second, Goldberg and Reed's emphasis on the remarkable resiliency exhibited by world trade in the face of recent shocks, including the US-China trade war and the COVID-19 pandemic, is also uncontroversial. Some measures of globalization, such as the ratio of world trade to world GDP, plummeted in the spring of 2020, but the recovery from this collapse was fast and robust. Goldberg and Reed provide novel micro-level evidence supportive of the view that, if anything, trade integration increased the resilience of economies during the COVID-19 pandemic.

Third, I also agree that the rhetoric in policy circles appears to have taken a decidedly nationalistic tone in recent months. In fact, in my recent paper I concluded that "the main challenge for the future of globalisation is institutional and political in nature" and that the global pandemic that was unfolding at the time of my writing could "aggravate policy tensions across countries and further contribute to a new era of significant isolationism, much as the world witnessed in the 20th-century's Interwar Period" (Antràs 2021, 43). It may seem that I invoke these quotes to lobby for induction into the Astrologists' Hall of Fame, but I must come clean and admit that I did not foresee the geopolitical environment taking such a fast and such a worrisome turn for the worse. I was somewhat skeptical that President Biden would overturn many of President Trump's protectionist policies, but I was hopeful that he would have initiated talks with China, and I certainly did not expect the increasing diplomatic tensions between the United States and China that we have witnessed in March 2023. Similarly, I did not anticipate Russia's invasion of Ukraine in February 2022, though I will argue below that the implications of this conflict for the future of world trade are likely to be modest.

Despite my broad agreement with the authors' main arguments, I was asked to provide a critical discussion, so I must dutifully comply.

The remainder of this discussion will focus on outlining a few aspects in which my views depart a bit from those of the authors. In the process, I will also uncover some factors that the authors have ignored in their analysis but that I believe may be important in shaping the future of globalization.

RESILIENCY IS COSTLY I very much agree with Goldberg and Reed's emphasis on the fact that the relational nature of global value chains (GVCs) generates a form of stickiness that might explain why the geography of worldwide production has not yet changed much in the face of recent geopolitical shocks. Relatedly, the authors also acknowledge the role of sunk costs in generating this hysteresis, which is one of the leading themes of my 2021 paper on deglobalization.

One aspect that I would have perhaps stressed a bit more is that the sunk costs associated with the formation of global production chains are often very large in magnitude. To better grasp the relevance of these costs, consider the type of investments that a firm needs to carry out before being able to source parts, components, and services from a producer in a foreign country. First, the firm needs to gather information on a set of potential suitable suppliers in that country, or, in the case of greenfield investment, it needs to figure out a suitable location for a new plant. Next, the firm and its supplier need to invest in physical assets (a factory, specialized equipment capital, etc.) that are often customized to the needs of both parties. Finally, in an environment with imperfect contracting, the firm and its supplier will need to invest in relational capital, to ensure that the perceived contractual security of all agents in the transaction is sufficiently high. In practice, the latter implies that the initial transactions will be limited in size and will only grow slowly over time (Antràs and Foley 2015; Araujo, Mion, and Ornelas 2016).

An implication of these large overhead costs is that they naturally lead to the adoption of "lean and mean" global sourcing strategies. Although firms would prefer to rely on several suppliers to obtain a given component, in practice, multisourcing involves fixed costs that are too large for most firms to bear. Table 1 shows that only a very small share of US firms imports the same product (defined as a Harmonized System [HS] ten-digit code) from more than one source country.

In the face of recent events, it is tempting to argue that US firms were grossly under-diversified in their sourcing strategies and that, realizing their mistakes, they may seek more diversified strategies, such as a China Plus One approach. I am, however, skeptical about this view. Large global firms have sizeable procurement or supply chain management departments populated by highly trained managers. I think it is implausible to argue

Table 1. Number of Source Countries per Imported Product by US Firms

	Firm level		
	Mean	*Median*	*Max*
Mean	1.11	1.03	1.78
Median	1.00	1.00	1.00
95th percentile	1.61	1.00	4.00

Source: Reproduced from Antràs, Fort, and Tintelnot (2017), copyright American Economic Association.

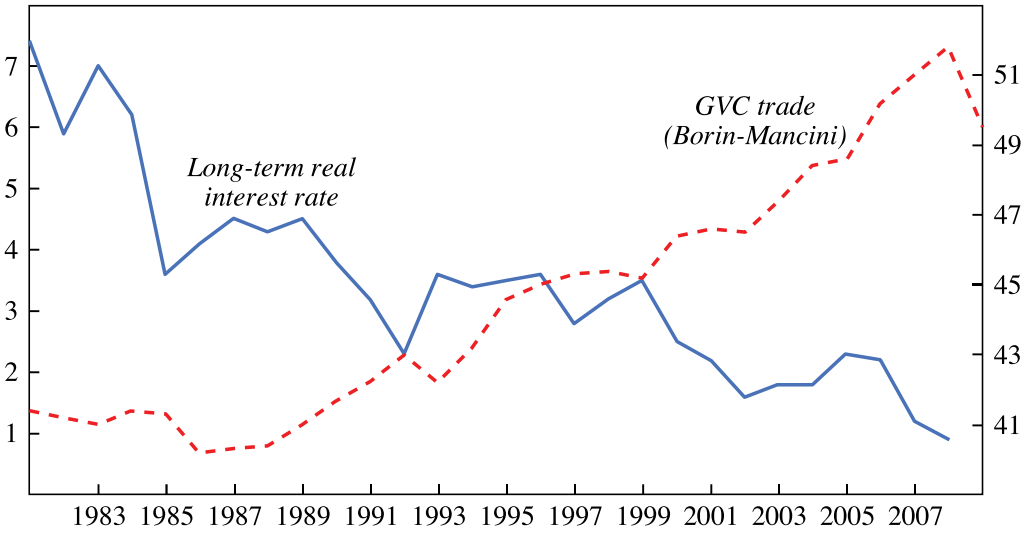
Note: Table reports statistics on the number of countries from which a firm imports the same HS10 product for the year 2007.

that these highly paid professionals systematically followed mistaken strategies, thereby inflicting millions of dollars in losses to their employers. Current supply chain disruptions will certainly lead firms to reassess their previous strategies, but my sense is that when firms crunch the numbers, they will realize just how expensive it is to bi-source or multisource, and thus most firms will abandon any drastic reorganization of their sourcing practices. As a result, we are not likely to see a significant increase in diversification in the near future.

THE ROLE OF INTEREST RATES A fact that trade economists often ignore is that the hyper-globalization period of the late 1980s, 1990s, and early 2000s came hand in hand with a substantial decline in real interest rates. Figure 1 depicts the share of GVC trade in gross exports based on a measure proposed by Borin and Mancini (2019), which corresponds to the share of world trade that involves more than one border crossing. By this metric, at the onset of the Great Recession, about 50 percent of world trade was related to GVC activity, with this share having climbed steadily in the previous twenty-eight years. The other series in figure 1 is borrowed from Farhi and Gourio (2018) and plots the ten-year US real interest rate (computed by subtracting inflation expectations from nominal Treasury yields) over the same period. The figure shows that US long-term real rates fell from about 7 percent in 1981 to less than 1 percent in 2009. A similar decline was observed in many other countries (Jordà and others 2019), and it not only applied to relatively risk-free rates but also to broader measures of the cost of capital faced by firms (Barkai 2020).

The causes of this secular decline in real interest rates are still being debated by macroeconomists, but candidate explanations include a slowdown in trend real output growth, demographic forces leading to an aging world population, a global saving glut, a shortage of safe assets, and increased wealth inequality.

Figure 1. Real Interest Rates and the Expansion of GVC (1981–2009)



Source: Author's compilation.

Note: The GVC trade line is created using a measure proposed by Borin and Mancini (2019); the long-term real interest rate line is adapted with permission from Farhi and Gourio (2018), copyright The Brookings Institution.

Independent of the causes of the observed fall in real interest rates, it seems plausible that this decline in the cost of capital was partly responsible for the remarkable growth in GVC activity. This is for a variety of reasons, which I have elucidated in recent work (Antràs 2023), but one salient aspect is that, as argued before, the formation of GVCs entailed significant setup costs, which were cheaper to finance in an era of low interest rates. Because many of these fixed costs were sunk in nature, a hypothetical reorganization of GVCs would again entail the need for significant new investments.

In an era of low or even negative real interest rates, this may not be a large impediment to reshoring or friendshoring, but the future path of real interest rates remains uncertain. As Goldberg and Reed point out, if an era of deglobalization is to play out, it is likely to lead to inflationary pressures. Even if those pressures are short-lived, they are likely to trigger tighter monetary policies around the globe, which may well increase the cost of borrowing for firms, and thereby make a reshoring or friendshoring less desirable.

In sum, even when diversification or reshoring may appear to be desirable strategies for firms, in the presence of large economies of scale in sourcing, it is far from obvious that they will be profit-maximizing policies when considering the sunk costs that would be associated with expanding

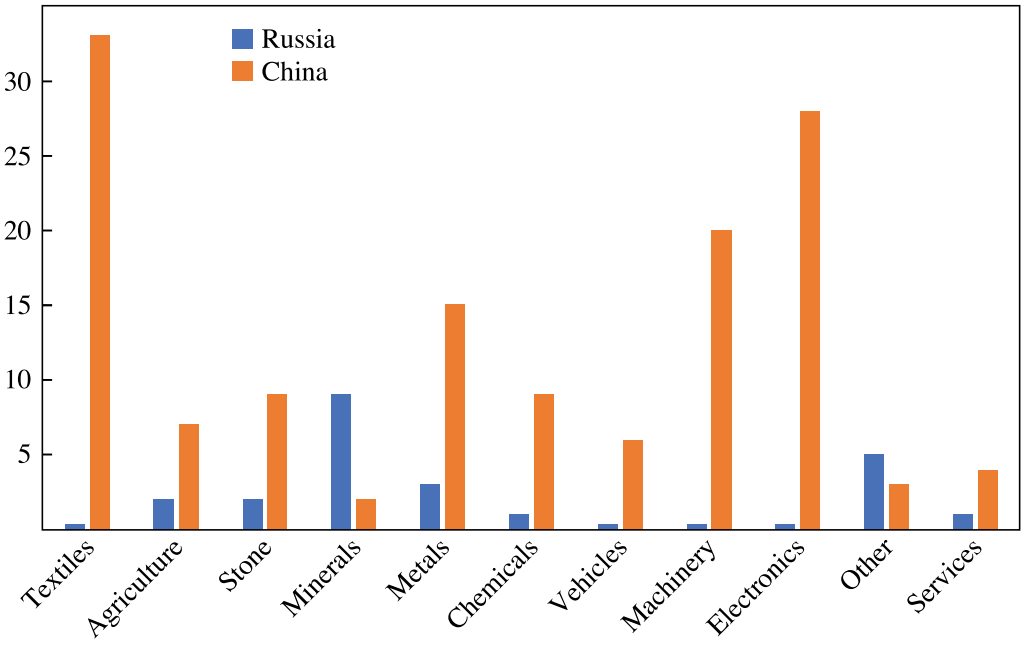
or reshuffling firms' global supply chains, particularly if firms contemplate these decisions in environments with higher interest rates than those that have prevailed in recent years.

RUSSIA VERSUS CHINA Russia's invasion of Ukraine in February 2022 constituted a flagrant violation of the territorial integrity of Ukraine, and the Russian government has justifiably been accused of war crimes and of crimes against humanity by several international organizations. Despite the dramatic aspects of this military conflict, I remain agnostic about its relevance for the future of globalization. Goldberg and Reed appear to confer much more relevance to this event, and they label the invasion a "catalyst for this new phase in the deglobalization movement." I do not deny that the Russia-Ukraine conflict has generated supply chain disruptions in the world economy (especially in Europe) and that it has also aggravated geopolitical tensions between the United States and China. Nevertheless, the implications of a decoupling of Russia from the global trade system would be relatively minor, and a counterfactual without the February 2022 invasion would have still witnessed rising geopolitical tensions.

To motivate my first point about the magnitude of the disruptions, it suffices to take a cursory look at the composition of the Russian economy as indicated by Russia's global share in the world exports of various (broadly defined) sectors. As is clear from figure 2, this share is negligible (lower than 0.5 percent) in all technologically intensive sectors in which GVC activity is dominant, such as vehicles, electronics, or machinery. Only in minerals and other primary products does Russia account for a significant share of world trade, but this share is lower than 10 percent for all two-digit industries. Even when focusing on narrower industry categories, such as exports of crude petroleum (HS code 2709) or natural gas (HS code 2711), the Russian market share is only 11.5 percent and 9.1 percent, respectively.[1] It is striking to contrast these figures with those recorded by China, as in figure 2. Clearly, a decoupling of China would have much dearer implications for the world economy than a Russian decoupling. This view is supported by the recent work of Bachmann and others (2022), who predicted that the economic effects of a potential cutoff of the German economy from Russian energy imports would not have been as catastrophic as some commentators in Germany were proclaiming.

1. See OEC, "Crude Petroleum," http://oec.world/en/profile/hs/crude-petroleum, and OEC, "Petroleum Gas," http://oec.world/en/profile/hs/petroleum-gas. It has been argued, however, that trade statistics do not provide an accurate portrait of trade in natural gas via pipelines. According to International Energy Agency statistics, Russia accounted for 18.7 percent of world exports of natural gas in 2020.

Figure 2. Russia's and China's Global Market Share in Exports by Sector



Source: The Growth Lab at Harvard University. The Atlas of Economic Complexity. http://www.atlas.cid.harvard.edu.

It may be argued that the shadow of the Cold War looms large and that Russia's invasion of Ukraine has rekindled geopolitical tensions that may drive the world toward increased isolationism. This appears to be what Goldberg and Reed suggest in their piece, particularly when they relate the invasion to increased concerns about national security, new demands of decoupling, the entry of the term "friendshoring" into the international trade vocabulary, and the use of export restrictions in the semiconductor sector. I am much less convinced about such a strong link existing. President Trump invoked national security concerns (via section 232 of the Trade Expansion Act of 1962) when he imposed tariffs on steel and aluminum in March 2018, close to four years before Russia's invasion. Similarly, concerns about the semiconductor industry, both in terms of a global chip shortage and the geopolitical consequences of the concentration of chip assembly in Taiwan, significantly predate the Russia-Ukraine crisis. Finally, the term "friendshoring" was popularized by US Secretary of the Treasury Janet Yellen in April 2022, but as Goldberg and Reed correctly point out, it had already been used in 2019 by US Commerce Secretary Gina Raimondo, when pushing Congress to approve a $52 billion package to bolster the US semiconductor sector (Shepardson 2021). For these

reasons, and as I mentioned above, it is not too clear to me that a counterfactual without the Russian invasion of Ukraine would have delivered a much rosier geopolitical environment today.

Regardless of the source of recent geopolitical tensions, I am increasingly concerned about the possibility of China decoupling from world markets. Until recently, I had held the view that the costs of decoupling (at least in present times) would have been too high for China to bear. A commitment to multilateral liberalization thus appeared to be the most pragmatic stance for China over the next few years. A key question, however, is with whom China would decouple. Most commentators and researchers take for granted that China would essentially go their own way, perhaps bringing some neighboring countries into their sphere of influence.[2] But the sheer size of its economy makes China the top trading partner for dozens of countries in the world, including many traditional allies of the United States, such as Australia, Japan, Korea, Chile, and Brazil.[3] If a decoupling scenario were to play out, these countries would face a nontrivial choice about which bloc to join, and the United States might end up being left more isolated than many commentators currently expect.

BEYOND GOODS MARKETS: DEGLOBALIZATION IN LABOR MARKETS Although most of Goldberg and Reed's paper is focused on the potential for a deglobalization of goods markets, they briefly comment on labor markets in section I. There, they point out that, despite a backlash against immigration in several parts of the globe, there is little evidence that migration flows have significantly slowed down or decreased in recent years. I share that opinion, and I provided similar evidence in my 2021 paper. Still, in recent years my views on this issue have become a bit more pessimistic. This is for at least four reasons.

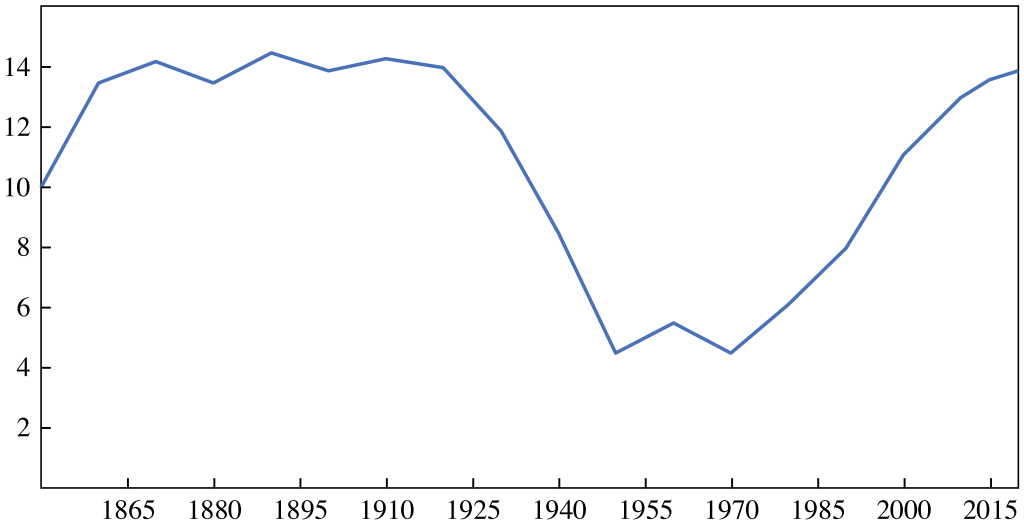
First, although the stock of migrants as a percentage of the world population has continued to rise in recent years, much of that increase is accounted for by a handful of countries that have welcomed refugees fleeing conflict. Many countries have been much less accommodating, and even in the United States, one can discern from figure 3 a slowdown (or even a halt) in the rate of growth of immigration.

Second, as figure 3 also indicates, periods of deglobalization in goods markets, such as the twentieth century's interwar period, tend to be periods

2. See, for example, Eppinger and others (2021).

3. See the illuminating figures at Visual Capitalist, "Countries Connected to Their Primary Trading Partner in 2020," https://www.visualcapitalist.com/wp-content/uploads/2022/02/2020-trading-partners.html.

Figure 3. Foreign-Born Population as a Percentage of the US Population (1850–2020)



Source: US Census Bureau.

with significant deglobalization in labor markets. Between 1920 and 1950, the share of foreign-born population in total US population fell from 14.8 percent to 4.7 percent. It is hard to predict whether the United States and other industrialized countries will implement tighter immigration policies in years to come, but we have already seen hints of increasingly strict policies. In the case of the United States, this has manifested itself in specific policies to curb illegal immigration of low-skilled individuals (such as President Trump's famous border wall with Mexico), but it has also translated into a severe shortage of highly educated foreign individuals, whom US firms in the tech industry would welcome with open arms (Shear and Jordan 2020).

Third, even if a scenario with significant deglobalization in labor markets is a low-probability event, it is important to emphasize that such a scenario would be exceedingly costly for the world economy. As a trade economist, I may lose sleep over the implications of a Chinese decoupling and the real income implications of the implied reorganization of GVCs. Yet, according to state-of-the-art quantitative trade models, the real income implications of such a decoupling would hardly amount to a few percentage points of world GDP.[4] Conversely, the real income implications of

4. For instance, Eppinger and others (2021) find that a repatriation of GVCs would reduce US real income by a mere 2.2 percent.

restricting migration flows are likely to be orders of magnitude larger, as forcefully argued by Clemens (2011). It may be argued that by focusing on static gains from trade, the current workhorse quantitative trade models underestimate the costs of decoupling in goods markets. For instance, a worse exploitation of economies of scale or diminished knowledge flows across countries may well have an impact on innovation and lead to magnified losses from deglobalization.[5] Nevertheless, the same exact argument can be made about quantitative evaluations of immigration restrictions. There is by now a significant body of work establishing a causal link between immigration and innovation, so the income costs of a deglobalization of labor markets are likely to remain orders of magnitude larger than those associated with a deglobalization in goods markets.[6]

The fourth and final reason for being particularly concerned about increasing restrictions on migration flows is the fact that the costs of those reduced flows are likely to be borne disproportionately by individuals who would like to emigrate but are not allowed to. These individuals would overwhelmingly have emigrated from less developed economies, and thus these restrictions will amount to leaving millions of individuals stuck with levels of income well below the world average. Under the plausible assumption that the marginal utility of income is decreasing in income, the welfare implications of migration restrictions are thus likely to be considerably larger than the associated real income implications.

NEEDED: A MULTIDISCIPLINARY APPROACH A famous adage, sometimes attributed to the physicist Niels Bohr and to others, including baseball legend Yogi Berra, states that "prediction is very difficult, especially if it is about the future."[7] Fortunately, economic science made enormous progress in the twentieth and early twenty-first centuries, so we are now much better equipped to make informed projections about the real income implications of differential possible policy scenarios.

This applies specifically to the field of international trade, which has become decidedly more empirical in recent years and has also embraced the quantitative revolution brought about by macroeconomics. Thanks to these

5. See, for instance, Sampson (2016).

6. See Kerr (2018) for a nontechnical overview of the link between innovation and immigration, and Bernstein and others (2022) for a more recent paper on this.

7. See, for example, Cranfield University, "Forecasting—Prediction Is Very Difficult, Especially If It's About the Future!," https://blogs.cranfield.ac.uk/cbp/forecasting-prediction-is-very-difficult-especially-if-its-about-the-future/.

developments, trade economists are now able to quickly produce projections for how world trade and world income will respond to counterfactuals with arbitrary changes in trade barriers. The work by Eppinger and others (2021) studying the implications of a Chinese "decoupling," by Bonadio and others (2021) and Çakmaklı and others (2021) on the response of world trade to the COVID-19 pandemic, or by Bachmann and others (2022) on the implications of Russia's invasion of Ukraine are recent examples of this exciting development.

As I have written elsewhere (Antràs and Chor 2021), I have some qualms about this quantitative revolution in the field of international trade. The most widely used models for quantitative analyses, such as the model by Caliendo and Parro (2015), constitute a blend of calibration and estimation, but for my taste, there is too high a ratio of calibration to estimation. More specifically, authors typically calibrate thousands of parameters (or combinations of parameters) to make their model fit the data exactly. This, I believe, is problematic because these models impose strong assumptions on functional forms; calibrating thousands of parameters to fit the data exactly amounts to a form of overfitting that is likely to lead to poor out-of-sample performance.

In my view, the international trade field should transition away from high-scale calibration exercises and fully embrace more standard structural estimation approaches, which are pervasive in many other areas in economics (such as industrial organization), and which are likely to produce more reliable counterfactuals.

As a matter of fact, I will conclude with a call for even more interdisciplinary studies of the world economy. Trade economists should look not just outside of trade or macroeconomics and borrow from other fields in economics. But they should also look beyond economics. When asked to speculate about the future of the world economy, trade economists are equipped to trace the real income implications of different geopolitical scenarios, but we have little sense of which geopolitical scenarios are more likely to play out. To the question, Will the world economy deglobalize? we can at best play around with different scenarios in which trade barriers vis-à-vis certain trading partners go up by different possible amounts. I firmly believe that these exercises are useful and can have an impact on policy, but they are not necessarily useful in producing a meaningful probability distribution over possible future scenarios.

Given the prominence of geopolitical forces shaping current events, it seems particularly important for trade economists to gain a better

understanding of the interplay between international relations and international trade. In our quantitative trade models, governments set taxes and tariffs, and they may even engage in trade wars and trade talks, but the modeling and objectives of these governments are quite distinct from how international relations scholars view governments as players trying to flex their power under the Hobbesian anarchy of the international arena. The geopolitical environment shapes economic policy and results in a particular configuration of international trade flows. But the structure of international trade flows also affects the payoffs of governments in the underlying geopolitical game, even if these governments care about more than the mere economic well-being of their constituents. Only by jointly modeling these forces will trade economists be able to produce well-defined projections for how the world economy is likely to evolve over the coming years.

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COMMENT BY

DOUGLAS A. IRWIN Twenty-four years ago, at the Brookings Trade Forum, I presented a paper entitled "Is Globalization Today Really Different from Globalization a Hundred Years Ago?" (Bordo, Eichengreen, and Irwin 1999). That paper was written at a time of rapidly increasing global economic integration. The opening of China, the transition from communism to capitalism in Eastern Europe and the former Soviet Union after the fall of the Berlin Wall, and the reduction of trade and investment barriers by many developing countries during the 1980s and 1990s all contributed to a remarkable expansion of world commerce.

The purpose of the paper was to evaluate whether world economic integration at the time had exceeded that experienced in the first era of globalization in the late nineteenth and early twentieth centuries. That earlier globalization saw steadily increasing trade flows, large international capital movements under the gold standard, and the mass migration of Europeans to North and South America and elsewhere. By looking at basic data on trade volumes, capital flows, and labor migration during the two periods, we concluded that the mid-1990s era of globalization had gone beyond that seen prior to World War I. At the time, that was a closer call than you might have thought because global integration was pretty extensive by 1914. In the decade after our paper was written, of course, globalization intensified into what some called the hyper-globalization of the 2000s. That left no doubt that early twenty-first-century integration had surpassed that of the early twentieth century.

Thinking back to 1999, it would have been difficult to imagine that just a quarter of a century later Brookings would have to have a discussion about deglobalization. Or would it? Around the time our paper was written, several economists, such as Jeffrey Williamson (1998), had forebodings about the future and reminded us that what could go up could also go down. After all, the first era of globalization crashed and burned with the outbreak of World War I: the gold standard was abandoned, trade barriers were raised, and immigration restrictions were imposed. The interwar period of the 1920s and 1930s saw deglobalization on a large scale—less trade, reduced migration, and diminished capital flows. So reversals of globalization are certainly possible, and their effects can be long-lasting. It took several decades after World War II for the world economy to recover from that costly implosion.

The current era of globalization has not run into a world war, but perhaps it has hit a brick ceiling. As Goldberg and Reed note in their fine paper, globalization seems to have peaked around the time of the global

financial crisis of 2008–2009 and has encountered many difficulties since. The rise of geopolitical tensions, leading to the US-China trade war, questions about the resilience of supply chains during the COVID-19 pandemic, increasing national security concerns about excessive dependence on semiconductors from Asia, disruptions caused by Brexit and Russia's invasion of Ukraine, talk of friendshoring in trade and investment, the use of government regulation (and tax incentives) to promote domestic production of electric vehicles, and the introduction of a carbon border adjustment mechanism as part of the European Union's environmental policy—all suggest we have entered a new era.

Goldberg and Reed have done an excellent job of providing an early assessment of this new period. They have a difficult assignment because events are changing rapidly and government actions are a moving target. Many policy measures have been proposed and some are about to be implemented, so their long-term impact on trade and investment flows has yet to be seen. Still, the paper has many insightful and wise observations. Their basic point, which they argue effectively, is that the world is not deglobalizing. Instead, government policies—in some sectors and with some countries—are acting to brake if not reverse globalization on grounds of resilience, national security, and the environment.

Globalization is often described as the increased interaction between countries in terms of trade in goods and services, capital flows, labor migration, and technology and data. The paper does not take a comprehensive view of globalization in each of these areas but rightly focuses on trade in goods.[1] That is where policy action, particularly in the United States, appears to be focused.[2] In doing so, they push back against some of the common narratives that appear to be driving policy. For example, they conclude that "despite the prominence of resilience concerns in the public debate in the past three years the evidence to date provides no support either for the view that global supply chains were not resilient during the pandemic or that the world economy would have been more resilient if there had been less dependence on foreign inputs and trade." They maintain that the policy backlash is not being driven by producer or worker interests but by governments: "deglobalization is not market-driven; rather it is the result of government-led actions and policies that had little support, at least initially, from the private sector."

1. This is something that Chandy and Seidel (2016) did a few years ago.

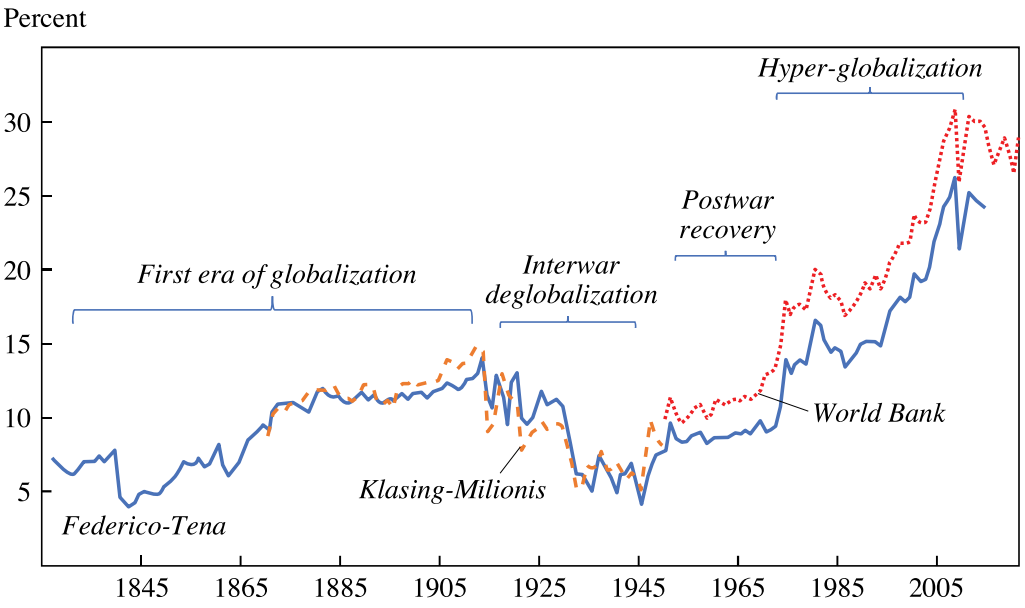
2. Of course, the Trump administration tried to reduce immigration, while seeking to encourage foreign capital inflows and discourage capital outflows.

They also note that "national security is the most powerful argument against unconstrained, market-driven globalization to date. It is also the most problematic as it cannot be verified directly by researchers, market analysts, or journalists—one has to place faith in the government's intelligence sources." This important observation has implications for all trade policy economists. Efficiency or even distributional effects of policies are no longer the principal criteria used to evaluate the desirability of many policy actions. Instead, national security considerations now dominate the discussion. (Foreign policy considerations, of course, have always been paramount in actual decision-making, although in the past they were often aligned with efficiency goals.) Ever since Adam Smith famously stated that "defence, however, is of much more importance than opulence" (1976, 464–65), economists usually step back, concede that security trumps efficiency, and accept the prima facie case for national security. Such interventions in trade are usually taken as given and put in the bucket of noneconomic objectives that governments have, as constraints to be minimized in the quest for economic efficiency (Bhagwati 1967; Hoekman, Mavroidis, and Nelson 2023). But the stakes are so high and the national security claims have become so broad and all-encompassing that economists have to get involved in this debate. Unfortunately, national security considerations are hard for economists to evaluate, often requiring evaluation of tail risks and other factors that defy easy measurement or quantification. They add a big element of uncertainty and difficult judgment calls into standard cost-benefit calculations.

Since I largely agree with the thrust of the paper, I thought I would put recent globalization trends in historical perspective rather than comment on the specific contributions of this paper. Figure 1 of the paper shows the ratio of world exports to GDP since 1989, where there is a flatlining of the share since about 2008. The flattening seems to indicate a break from the previous twenty years, but is it unusual? Is it a historical anomaly, or have we seen such pauses in the past?

To answer this question, we need a longer time series. Figure 1 here presents the ratio of world trade to GDP going back to 1827. With this figure we can identify five stages of modern globalization. The first stage, from 1827 to 1914, is the first era of globalization and the later part of this period served as a benchmark for Bordo, Eichengreen, and Irwin (1999). This was a period of rising trade due to lower transportation costs, with the introduction of the steamship and refrigeration, and some European tariff reductions following the Cobden-Chevalier trade agreement between Britain and France in 1860. This was a period of growing capital flows under the gold standard and mass migration from Europe to the rest of the world.

Figure 1. World Exports as a Share of World GDP, 1827–2021



Sources: Data from Klasing and Milionis (2014); Federico and Tena-Junguito (2019); and World Bank.
Note: Data available at https://www.uc3m.es/ss/Satellite/UC3MInstitucional/es/TextoMixta/1371246237481/Federico-Tena_World_Trade_Historical_Database and https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS.

Toward the end of this era of globalization there were rising geopolitical tensions between the old superpower of Britain and the rising industrial power of Germany. Rising trade frictions also led to a modest protectionist backlash in the late nineteenth century, particularly in agricultural goods but also to some extent for manufactured goods (Williamson 1998). These factors may account for the stabilization of the export-to-GDP ratio after 1880, when this measure of globalization seems to stall.

The second stage, from 1914 to 1945, encompasses two destructive world wars and the intense protectionism of the Great Depression of the 1930s. This period of deglobalization is characterized by higher trade barriers, more capital controls, and immigration restrictions. A third stage covers the postwar period from 1945 to the mid-1980s when trade recovers but without participation of the second world (the communist countries of the Soviet Union, China, and Eastern Europe) or the third world (the Global South, which was committed to import substitution policies). When those countries started to rejoin the global economy in the 1980s and 1990s, economic integration really took off, marking a fourth stage. The question is whether we have entered a new, fifth stage of deglobalization since 2008.

How should we understand these globalization cycles? Goldberg and Reed suggest that integration is driven by changes in technology and in policy. Just as Goldin and Katz (2010) suggest that there is a race between technology and education in determining the wage premium for higher-educated workers, there is a similar interplay between technology and policy in the case of trade integration. Falling trade costs due to technological developments can act as an accelerator for global integration in bringing markets together.[3] By contrast, policy can work either to bring markets together, such as deepening integration through trade agreements, or push them further apart by raising trade barriers across markets. (To use a car analogy, policy can act not just as a brake on integration but can also throw the whole vehicle into reverse, as seen in the interwar period.)

This analogy helps us interpret the history of global integration but also think about the past few decades. The hyper-globalization period of the 1990s and 2000s was a period in which technology and policy were working in the same direction, toward the integration of markets. New innovations such as the shipping container and air transport were fully exploited in moving goods across markets. New trade agreements in the early 1990s, such as the North American Free Trade Agreement (NAFTA) and the Uruguay Round of trade negotiations that created the World Trade Organization (WTO), brought down trade barriers and hence trade costs (World Bank 2020). Equally if not more important were unilateral reforms in many emerging markets, such as China and India (Irwin 2022).

Today, technologies that reduce trade costs (at least for moving merchandise goods) may have hit diminishing returns, slowing global integration except in places such as Africa, where the scope for further improvements is great. Meanwhile, trade liberalization has stalled both at the multilateral level (no major agreements at the WTO) and at the unilateral level. Even worse, policy has moved in a reverse direction and is pulling markets apart, as new trade restrictions creep into the system. As Goldberg and Reed note, this policy shift from previous decades is being driven by governments of their own accord, which are not acting at the behest of producers and workers who are adversely affected by foreign competition. The US foreign policy establishment, which had long supported trade integration as enhancing national security, now views it differently. The Trump and Biden administrations have both rejected new trade agreements on grounds of national security and worker welfare, marking a new path for US trade policy.

3. Of course, some technologies can substitute domestic production for imports or external sourcing, such as 3D printing.

It is difficult to predict whether global integration simply stabilizes at current levels, as it did previously, in the 1880s and 1960s, or actually declines, as it did in the interwar period. At this point it is hard to imagine the configuration of technology and policy that will push global integration to much higher levels. All this depends on future policy developments.

Goldberg and Reed are optimistic that we are not on the cusp of a deglobalization era. Richard Baldwin (2022) gives us further reasons to believe that the recent decline in the trade share is not a cause for worry. He finds that about two-thirds of the slide is due to the declining value of trade in mining and fuels. Probing further, he finds that this slide is not due to falling volumes but to falling prices. As metals and fuel prices came off a historic high from 2011, marking the end of a commodity super cycle, the value of world trade in these categories has fallen to more normal levels. Thus, the declining trade share is partly a benign development not driven by policy decisions.

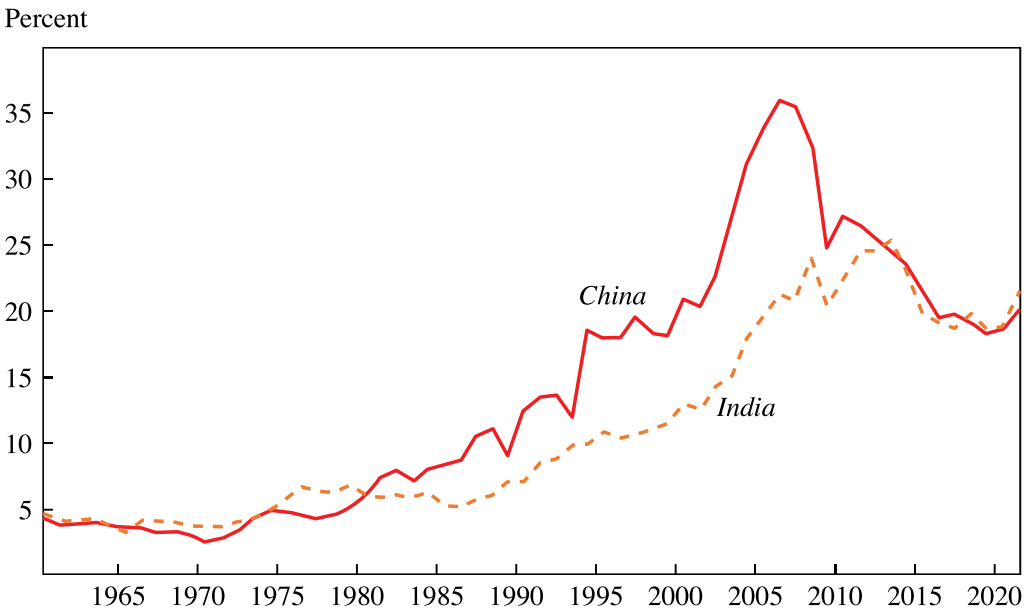
Baldwin (2022) and others also point out that trade in services and data is still growing at a healthy rate and shows no signs of faltering. While these flows are still small in relation to merchandise trade, these developments suggest that globalization is evolving and changing, not declining.

At the same time, it is worth noting that part of the decline in the export-to-GDP ratio can be observed in two large countries, China and India. As figure 2 shows, both countries are coming off large increases in the export-to-GDP ratios in the 2000s. Whether the recent decline is due to some natural rebalancing or to active policy measures to limit trade is unclear and deserves further study. But a case can be made that these two countries have been turning inward under President Xi Jinping and Prime Minister Narendra Modi.

Should we be concerned about the slight reversal of this measure of trade integration? Of course, any answer depends on the reasons for the decline, but if driven by government policies, then there are welfare consequences to any potential deglobalization scenario. If global economic integration led to tangible gains, then disintegration will lead to economic losses.[4] The International Monetary Fund has collected some preliminary evidence on the welfare cost of geopolitical fragmentation of trade and suggests that it could be around 1 percent of GDP in a situation limited to trade fragmentation. If there was to be full technological decoupling and reduced knowledge diffusion combined with sectoral misallocation, the costs are much higher, in the 8–10 percent range (Aiyer and others 2023). While the

4. For evidence on the case of Brexit, see Dhingra and Sampson (2022).

Figure 2. Exports as a Share of GDP, China and India, 1960–2021



Source: World Bank.
Note: Data available at https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?locations=CN.

precise estimates vary greatly depending on the model assumptions and scenario envisioned, a fragmentation of the world economy could come at a substantial price.

Goldberg and Reed's paper will stimulate further work on these matters. The big question is how much government policies will actively try to further reverse the high level of integration achieved over the past few decades.

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GENERAL DISCUSSION Maurice Obstfeld began with a comment on the geopolitical implications of globalization. Obstfeld offered China's Belt and Road Initiative and its Regional Comprehensive Economic Partnership as examples of a country using trade to build regional relationships. He noted that the United States had started down an analogous route, hoping that the Trans-Pacific Partnership (TPP), alongside its trade benefits, would promote US geopolitical influence in Asia and over the rules of the broader world trading system.[1] Obstfeld suggested that US advocacy of friendshoring, or the act of primarily trading with and investing in ally countries,

1. Mireya Solis, "The Geopolitical Importance of the Trans-Pacific Partnership: At Stake, a Liberal Economic Order," Brookings Commentary, March 13, 2015, https://www.brookings.edu/articles/the-geopolitical-importance-of-the-trans-pacific-partnership-at-stake-a-liberal-economic-order/; Daniel Twining, Hans Kundnani, and Peter Sparding, *Trans-Pacific Partnership: Geopolitical Implications for EU-US Relations* (Strasbourg: European Parliament, 2016), https://www.europarl.europa.eu/RegData/etudes/STUD/2016/535008/EXPO_STU(2016)535008_EN.pdf; and Cary Huang, "It's the Geopolitics, Stupid: US-Led TPP Trade Pact Less about Boosting Economies Than about Containing China's Rise," *South China Morning Post*, November 6, 2015, https://www.scmp.com/news/china/policies-politics/article/1876024/its-geopolitics-stupid-us-led-tpp-trade-pact-less-about?campaign=1876024&module=perpetual_scroll_0&pgtype=article.

would be perceived quite differently now had the United States followed through on TPP in 2016–2017, rather than turning toward protection. In particular, he argued, a less protectionist United States embedded in TPP might have had more leverage to convince middle-income countries to support Western sanctions on Russia after its invasion of Ukraine. Obstfeld argued that in current circumstances, friendshoring reinforces negative sentiment and tense relationships between countries. He suggested that it perpetuates a cycle of fragmentation in the world economy.

Obstfeld also stated that current metrics of financial globalization are insufficient. He argued that the marginal financial trade between richer countries likely has minimal beneficial welfare effects and that there are instances, such as tax arbitrage or during the housing bubbles of the 2000s, where further financial globalization actually has negative social impacts. In contrast, Obstfeld said, the marginal capital flow to emerging markets has more potential to be socially productive, but these flows tend to be insufficient. Thus, typical quantitative measures of financial globalization trends may not be a sound basis for judgments on the benefits coming from cross-border asset trade.

Tristan Reed responded to Obstfeld and referred to figure A1 in the online appendix, which uses a time series by Coppola and others.[2] The figure accounts for foreign investment through tax havens and still shows an increase in financial trade.

Viral Acharya asked, in reference to the previous day's discussion on emerging markets, if changing sentiment and rhetoric on globalization is related to income inequality within countries. He continued by asking if the authors' empirical findings on globalization could be linked with macroeconomic outcomes such as widening inequality. Acharya also pointed out the discrepancy between research in manufacturing and goods versus services. He wondered if researchers' continual concern with manufacturing is a result of the jobs it creates. He added that the manufacturing and goods sector typically creates jobs on the lower end of the income distribution, whereas jobs in the professional and financial services are traditionally higher.[3] He suggested these differences may contribute to the changes in sentiment toward free trade.

2. Antonio Coppola, Matteo Maggiori, Brent Neiman, and Jesse Schreger, "Redrawing the Map of Global Capital Flows: The Role of Cross-Border Financing and Tax Havens," *Quarterly Journal of Economics* 136, no. 3 (2021): 1499–556.

3. US Bureau of Labor Statistics, "Table B-3. Average Hourly and Weekly Earnings of All Employees on Private Nonfarm Payrolls by Industry Sector, Seasonally Adjusted," https://www.bls.gov/news.release/empsit.t19.htm.

John Haltiwanger elaborated Acharya's point on the distinction between goods and services research, commenting on the discrepancy in data quality between the two sectors. He suggested research may be understating the growth in trade in services and that we could be witnessing a restructuring, not necessarily deglobalization. He added that it would be interesting to think about the changing political climate in relation to this restructuring. He continued by saying recent conversations are centered around the emergence and growth potential of artificial intelligence (AI). Haltiwanger said trade in services may grow if these predictions are correct.

Pinelopi Goldberg agreed that trade in services will become more important. However, she added, today it occurs on a much smaller scale and in a more restrictive way than do trade in goods.[4] She pointed to Douglas Irwin's discussion, in which he linked globalization and hyperglobalization to technology *and* policy. Although there are technological advancements in AI, Goldberg argued that policy around AI is moving in the opposite direction. She claimed that the current policy landscape does not support an increase in trade in services, but acknowledged that could change at any time.

Anne Case expanded on Acharya's points by mentioning the NAFTA negotiations. She stated that economists were aware that NAFTA would have a negative impact on the local labor market but presented it as an opportunity to retrain and reskill workers.[5] Case argued that because retraining never took place, this resulted in job losses that generated resentment toward international production and labor.[6] She added that, while important, COVID-19 and Russia's impact on supply chains only alleviated pressure that had been building since NAFTA.

Joseph Gagnon raised an additional point on trade imbalances. He cited work from the Centre for Economic Policy Research that found a strong, predictive relationship between trade imbalances and protectionist policies.[7] Gagnon further mentioned Goldberg and Reed's finding that the

4. OECD, "Trade in Goods and Services," https://data.oecd.org/trade/trade-in-goods-and-services.htm.

5. Shushanik Hakobyan and John McLaren, "Looking for Local Labor Market Effects of NAFTA," *Review of Economics and Statistics* 98, no. 4 (2016): 728–41, https://www.jstor.org/stable/24917047.

6. Public Citizen's Global Trade Watch, "NAFTA's Legacy: Lost Jobs, Lower Wages, Increased Inequality," factsheet, October 2019, https://www.citizen.org/wp-content/uploads/NAFTA-Factsheet_Deficit-Jobs-Wages_Oct-2019.pdf.

7. Etienne Fize, Philippe Martin, and Samuel Delpeuch, "Trade Imbalances and the Rise of Protectionism," VoxEU, February 12, 2021, https://cepr.org/voxeu/columns/trade-imbalances-and-rise-protectionism.

United States and the United Kingdom have the largest trade deficits.[8] He reflected on Donald Trump's own trade policies and his focus on closing trade deficits, despite them growing during his administration.[9] Gagnon suggested using the relationship between deficits and protectionist policies as a framework for discussing deglobalization. He used foreign exchange intervention and capital inflow taxes as examples of how policy could reduce deficits and minimize tensions between nations.

Eswar Prasad commented on the increased risk corporations with large-scale, multinational supply chains face. He reflected on the difficulties and high financing costs corporations confront when augmenting their supply chains in response to risk. Prasad suggested looking at other evidence to track deglobalization, such as foreign direct investment (FDI) flows. He referenced research from the International Monetary Fund (IMF) on geo-economic fragmentation.[10] The paper found a positive relationship between FDI flows and geopolitically aligned countries. However, Prasad used local shocks as an example of how realignment may not increase resilience. Although a corporation adapting its supply chain may be inefficient, Prasad noted that there may be an added insurance value for corporations knowing its supply chains are in a geopolitically aligned country.

Prasad continued by discussing the impact protectionist policies will have on low-income countries and global inequality. He used the Inflation Reduction Act and the CHIPS and Science Act as two examples of the United States prioritizing domestic production. Prasad referred to the Made in China 2025 and the Made in India initiatives as examples of similar international policies reflecting protectionist sentiment. He argued that these policies will exacerbate global inequality because they leave out economies that never benefited from globalization.

Reed agreed with Prasad's concerns about global inequality and cited recent evidence that trade is being funneled between high-income countries

8. Bureau of Economic Analysis, "U.S. International Trade in Goods and Services, February 2023," news release, https://www.bea.gov/news/2023/us-international-trade-goods-and-services-february-2023; Office for National Statistics, "UK Trade: January 2023," https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/bulletins/uktrade/january2023#:~:text=The%20trade%20in%20goods%20deficit,billion%20to%20%C2%A336.5%20billion.

9. "Read Donald Trump's Speech on Trade," *Time*, June 28, 2016, https://time.com/4386335/donald-trump-trade-speech-transcript/#lnkibaj38by47dfvnqd.

10. JaeBin Ahn, Benjamin Carton, Ashique Habib, Davide Malacrino, Dirk Muir, and Andrea Presbitero, "Geoeconomic Fragmentation and Foreign Direct Investment," in *World Economic Outlook, April 2023: A Rocky Recovery* (Washington: International Monetary Fund, 2023).

and leaving low-income ones out. He pointed to two US trade agreements with the European Union and Japan focused on trade in batteries and critical minerals.[11]

Martin Stuermer commented on electric car batteries being imported from countries considered not friendly to the United States. Stuermer asked the authors for their experience evaluating the impacts of local content requirements and if they could predict these policies' impact on future trade in batteries as well as critical minerals.

Goldberg clarified what local content requirements are. She explained that American firms producing semiconductors are not currently much affected by export restrictions. However, these new policies require any country utilizing US technology to gain approval to export to China. She added that this inevitably forces countries to choose between the United States and China.

Steven Davis questioned whether geopolitical tension and conflict have a negative impact on economic growth and innovation. Davis cited the US Defense Department's investments in new technologies during the Cold War and the US space program, both spurred by geopolitical rivalry with the Soviet Union. He also referred to China's recent investments in leading technologies and argued that some were made in what China perceived as its national security interests. His last example was the push to develop and mass-produce new vaccines after the onset of the COVID-19 pandemic. That push also had overtones of geopolitical competition. It's possible, Davis suggested, that the positive effects of geopolitical tensions on innovation and research outweigh the negative impacts on trade.

Goldberg responded to Davis's comments and agreed that geopolitical tension leads to investments in innovation. She questioned whether there were better investments that could have been made. She suggested that there are less harmful reasons to invest in innovation.

Reed suggested there are also channels through which geopolitical tensions could harm innovation. He cited recent research that found the US Justice Department's investigations on Chinese researchers in the United States were followed by a decline in publications by and citations of scientists with previous collaborations with scientists in China, even if these

11. International Trade Administration, "EU—Country Commercial Guide," https://www.trade.gov/country-commercial-guides/eu-trade-agreements; Office of the United States Trade Representative, "U.S.-Japan Trade Agreement Text," https://ustr.gov/countries-regions/japan-korea-apec/japan/us-japan-trade-agreement-negotiations/us-japan-trade-agreement-text.

scientists were not themselves subject to investigations.[12] Reed added that regardless of the effects of innovation, increased trade restrictions would make it more difficult to collaborate and create low-cost, high-scale technology. He used solar panels as an example of a technology developed in the United States that is now cheaper and more prevalent because of production capacity abroad.

Donald Kohn brought up the intersection of globalization and inflation. He compared globalization to a positive supply shock and deglobalization to a negative supply shock. Kohn pointed out the figures in Goldberg and Reed's paper that showed globalization's peak in 2009–2010 followed by a period of decline. He noted that inflation was low during the initial onset of deglobalization and questioned whether globalization has a strong impact on inflation.[13]

Jonathan Pingle built upon Kohn's point and referred to the period following World War I. He noted that the postwar period was a time of both deglobalization and disinflation, even amid immigration restrictions. He cited the paper's evidence of both FDI flows and the increase in international trade immediately following the pandemic. Rather than assume deglobalization will occur, he suggested questioning whether it will and how impactful the effects would be.

Goldberg pointed out the distinction between the level and direction of globalization. She noted that although the world economy may be moving in the direction of less globalization, globalization itself still exists. She commented on the unprecedented monetary policy actions that took place after the 2008 financial crisis that call for an explanation of why inflation remained low until 2021. Goldberg suggested that, although there is no clear econometric evidence on this phenomenon, globalization likely played a role in controlling inflation. To support her point, she referred to globalization's impacts on workers' bargaining power. She stated that if workers know their job can be outsourced to a low-wage country or performed by technology, they are less able to negotiate for a higher salary. She attributed some of the low levels of inflation to this loss in bargaining power.

Goldberg continued with a discussion of labor and the global integration of labor markets. She argued that trade differs from immigration in two

12. Ruixue Jia, Margaret E. Roberts, Ye Wang, and Eddie Yang, "The Impact of US-China Tensions on US Science," working paper 29941 (Cambridge, Mass.: National Bureau of Economic Research, 2022).

13. International Monetary Fund, "Inflation Rate, Average Comsumer Prices," https://www.imf.org/external/datamapper/PCPIPCH@WEO/OEMDC/ADVEC/WEOWORLD.

major ways. She contrasted the bipartisan support for domestic production with the polarization produced by immigration policy. Additionally, she argued that, as the United States continues to distance itself from low-cost trade partners, keeping labor laws flexible and allowing migration can help reduce inflationary pressure.

Reed closed the discussion by noting the impact Russia's invasion of Ukraine had on public sentiment toward deglobalization. He referred to the book *War by Other Means*, which argues for economists having less authority in foreign policy because their estimations can differ from national security experts.[14] He added that this changing sentiment has increased over time and became especially salient after the Russian invasion of Ukraine.

14. Robert D. Blackwill and Jennifer M. Harris, *War by Other Means: Geoeconomics and Statecraft* (Cambridge, Mass.: Harvard University Press, 2016).

Appendix not for Publication

Figure A1. Stock of portfolio and direct foreign investment

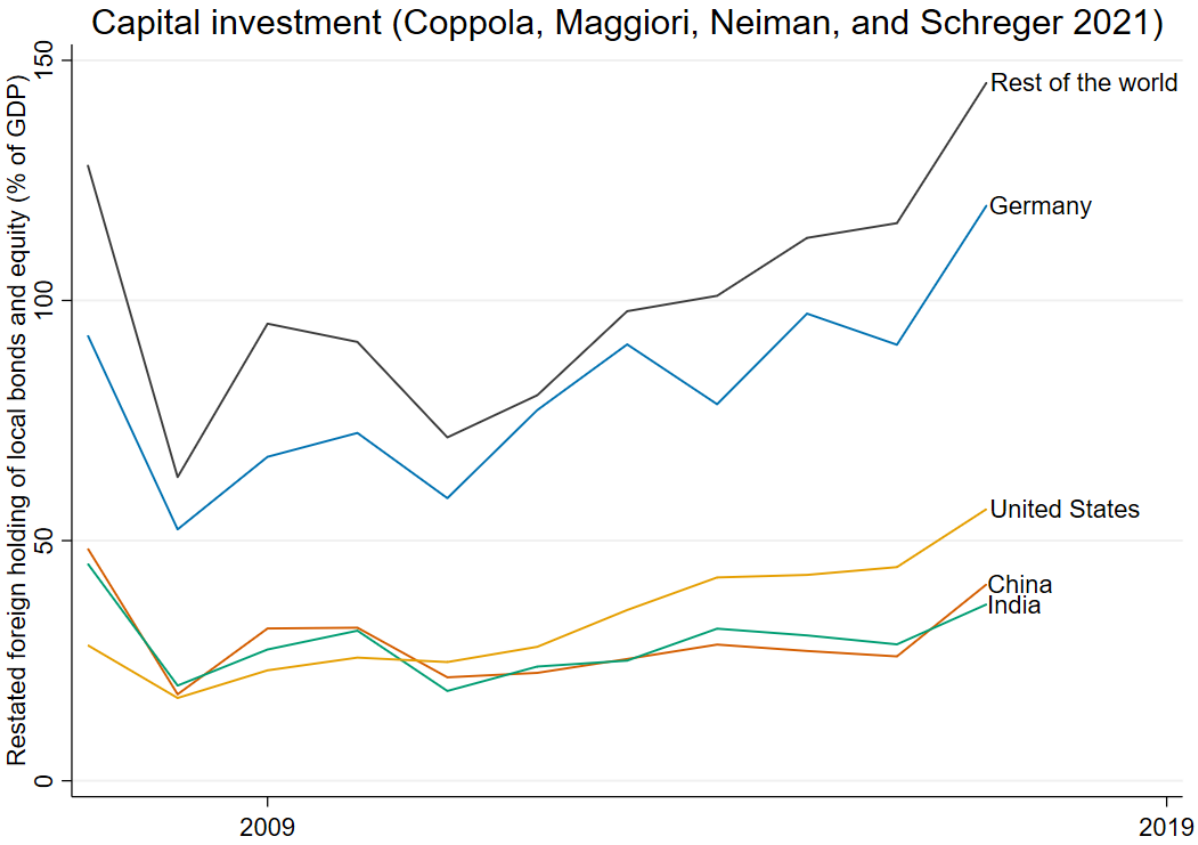

Table A1: Top Five US Import Sources for Critical Goods in 2022

Partner	*Percent of Imports*	*Value of Imports (US$ millions)*	*Partner*	*Percent of Imports*	*Value of Imports (US$ millions)*	*Partner*	*Percent of Imports*	*Value of Imports (US$ millions)*
Infant formula (630790)			Penicillin, put up in measured doses (300410)			Electric car batteries (850760)		
IRL	45.2	101.2	IND	25.3	89.2	CHN	65.2	6,537.7
MEX	30.3	67.9	SWE	18.2	64.1	ROK	9.3	931.9
AUS	7.2	16.2	ITA	17.2	60.8	JPN	7.6	762.5
GBR	6.4	14.3	AUT	12.6	44.4	HUN	3.3	328.4
NZL	4.3	9.6	CHN	5.4	19.2	POL	3.3	326.1
Crude oil (270900)			Face masks (HS 190110)			Semiconductor chips (854231)		
CAN	58.1	92,565.7	CHN	72.6	3,541.6	MYS	46.3	8,682.2
MEX	10.5	16,754.3	MEX	9.5	465.1	TWN	10.3	1,930.6
SAU	7.9	12,614.3	VNM	3.8	186.1	VNM	9.4	1,772.3
COL	4.0	6,443.9	IND	2.9	140.5	IRL	7.8	1,464.8
IRQ	3.7	5,912.8	DOM	1.3	61.1	CHN	6.5	1,212.2