The Enduring Social and Economic Consequences of the China Trade Shock

DAVID
AUTOR
MIT

Introduction

This paper will discuss the enduring social and economic consequences of the China trade shock. It will then turn to the political entailments that have followed and where they may take us.
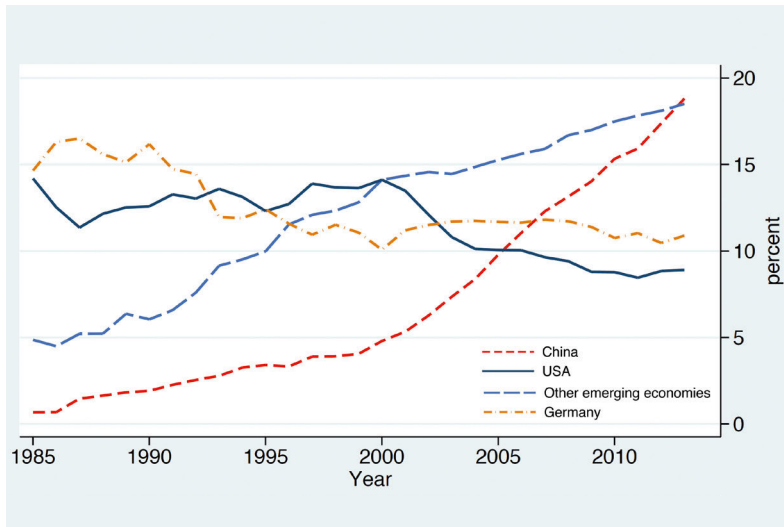
China's rise as a world manufacturing power

China's historic rise as a world manufacturing power is illustrated by Figure 1, where its share of world manufacturing exports increased from just above 0% in 1985 to nearly 20% in 2013, and it has risen subsequently. The surprise in this figure is not the large share of world manufacturing China has now captured; this is to be expected given China's enormous physical and human capital resources. Rather, the surprise is the speed at which China went from about 2% of world manufacturing in 1990 to approximately one-fifth of all manufacturing today. No such rapid increase had ever been observed before in such a brief period of time.

  China's historic rise as a manufacturing power is rooted in substantial part in internal developments within China itself. In the late 1980s, Deng Xiaoping, Chairman of the PRC, commenced market reforms and opening

to world trade that, among other things, enabled the flow of foreign direct investment into China and ultimately prompted the movement of hundreds of millions of people out of low-productivity agriculture in the Chinese countryside into highly productive export processing zones (see Figure 2). This radical change, and China's entry into the world economy, followed decades of continual political and economic upheaval under Mao Zedong. This change did not emanate primarily from US foreign policy but rather from China's own internal developments.
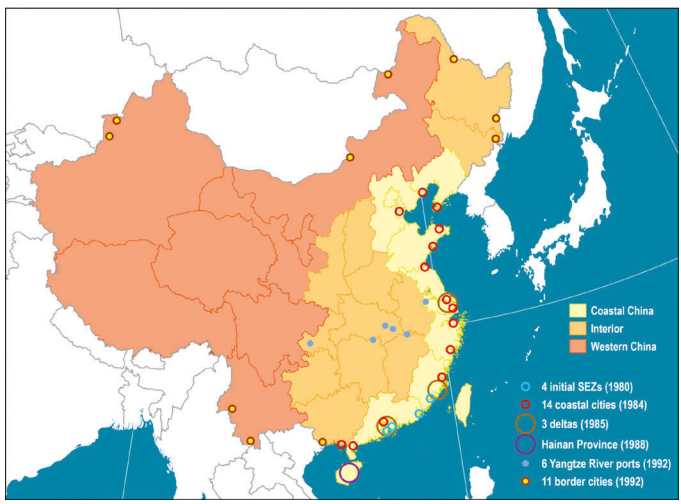
Figure 1: Shares of World Manufacturing Exports, 1985–2013
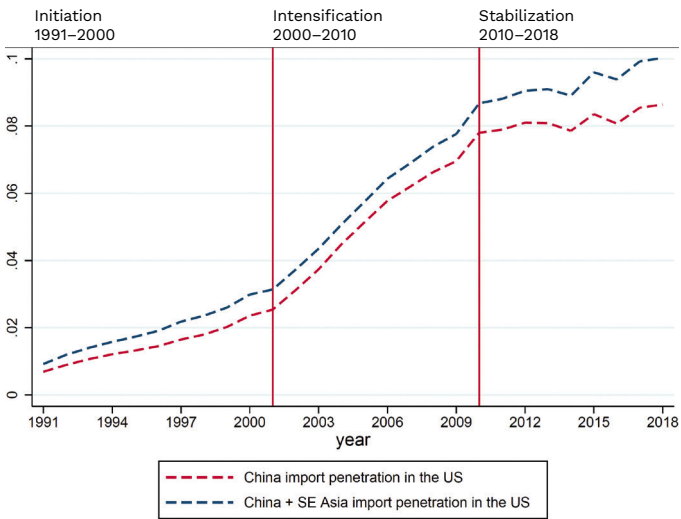

Source: Autor (2017)

This radical change can be observed in the landscape of Chinese cities. Shenzhen, which was a small fishing settlement in 1970, is today a vibrant city with skyscrapers inhabited by more than 12 million people. Over the past 50 years, Shenzhen's population has exploded, largely due to the growth of manufacturing jobs: most of the world's consumer appliances are assembled in the city's factories. China's rise as a manufacturing superpower, illustrated by Shenzhen's example, can be understood in three acts: (1) initiation from 1991 to 2000; (2) intensification from 2001 to 2010; and (3) stabilization from 2011 to 2018 (see Figure 3).

Figure 2: Special Economic Zones (SEZs) in China

Source: Rodrigue (2020)

Figure 3: China's Import Penetration in the US Market, 1991–2018

Note: Import penetration is defined as the ratio of US imports of manufactured goods to US domestic absorption (defined as gross output plus imports minus exports).
Source: Autor, Dorn, and Hanson (2021)

China's initiation is characterized by the internal reforms that enabled it to enter the modern manufacturing trading system. This period is illustrated by a slow but steady uptake of manufacturing exports to the US. The intensification period begins as China is granted Permanent Normal Trade Relations with the US in 2000, followed by China joining the World Trade Organization (WTO) in 2001. Starting then and for the following decade, China's import penetration in the US (i.e., its production of manufacturing goods consumed in the US) increased explosively (from 3% to 8%). After 2010, China's manufacturing entered a stabilization period during which its export growth slowed and its productivity boom decelerated. This period is characterized by a large-scale re-allocation of investment and a focus away from free enterprise and towards state owned enterprises (SOEs). The primary China trade shock, as many understand, is characterized by a 10-year period that is already behind us. The ensuing decade of relative stasis provides an opportunity to separate the longer run consequences of the China trade shock from its short-term impacts visible while it was ongoing.

The impact on the US and other countries

It can be argued that China's growth over the last three decades has created the modern world's middle class. Not only has it brought half a billion Chinese citizens out of poverty, it has also created prosperity in Central and South America, and spurred renewed investment in Sub-Saharan Africa, which was largely neglected by the West. Some may argue that this was not a benevolent investment, but when has Western investment ever been? On the plus side, these investments might also have caused the US and other countries to start competing for the attention of Sub-Saharan African governments. In his 2022 *American Affairs* article, David Grewal argues that one could imagine a different future in which the West had cultivated more democratic and westerly countries, arguing that there might be a third alternative to the "China's rise versus not China's rise" debate. Nonetheless, it is hard to overstate the importance of how much prosperity China's rise has brought to the rest of the world.
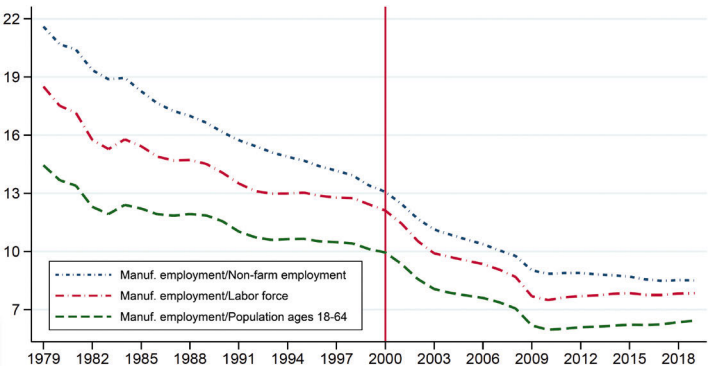
David Ricardo, the classical British Portuguese economist, observed and coined the phrase "comparative advantage." His insight was that trade allows countries to specialize in the goods in which they are relatively more productive. This means that rich and poor countries can both benefit from trading amongst themselves and with one another, even if rich countries have an absolute productivity advantage in everything they produce. In stark terms, free trade among consenting nations has the potential to raise GDP in all of them. In a *Journal of Economic Literature* article in 1997, Paul Krugman put this forcefully: "If economists ruled the world, there'd be no need for a World Trade Organization. The economist's case for free trade is essentially a unilateral case: a country serves its own interest by pursuing free trade regardless of what other countries may do."

Trade creates winners and losers, however. What is true for the welfare of a country in the aggregate does not necessarily apply for all the citizens in that country. Trade is redistributive. It has diffuse benefits and concentrated costs, both in theory and in practice; without compensatory policies, trade will grow the size of the pie and shrink some slices in absolute terms. Hence, dramatic changes in terms of trade are inseparable from redistributive consequences. Arguing that countries should simply engage in trading any goods with any country that is willing to trade, without attending to the domestic impacts, neglects the redistributive consequences of such trade.

As Krugman and Obstfeld (2008) argue, "owners of a country's abundant factors gain from trade, but owners of scarce factors lose... this means that international trade tends to make low-skilled workers in the United States worse off – not just temporarily, but on a sustained basis." By implication, trade with high-productivity, low-wage countries such as China is particularly likely to reduce the earning power of manufacturing workers in competing industries, and especially among non-college workers who do most of the manufacturing production. One component of that impact can be seen in the falling US manufacturing employment share (see Figure 4).

Manufacturing's share of employment began its decline within a few years of the close of the Second World War, and a further acceleration of that decline can be observed around the time China joined the WTO in 2001. A substantial share of that recent decline, at least 40%, can be confidently attributed to changes in trade.

Figure 4: The Falling US Manufacturing Employment Share, 1979–2019

Note: US manufacturing employment shares of total employment, labor force, and working-age population.
Source: Autor (2022)

Figure 5: US Manufacturing Employment, 1940–2023

Source: Data from St. Louis Federal Reserve Economic Data, All Employees, Manufacturing

Turning from the share to the count of manufacturing employment tells a more dramatic story. The high-water mark of us manufacturing employment was in 1979, when there were 19.6 million us manufacturing workers (see Figure 5). Over the following two decades, this number slowly declined to 17.4 million – about a 100,000 net reduction in manufacturing employment per year over two decades. Following that period, manufacturing employment fell much more rapidly – declining by a further 3.7 million over the course of 7 years – and fell even further during the Great Recession (although this last decline is not due of trade per se). After the financial crisis, manufacturing employment had something of a rebound, with the exception of the Covid-19 pandemic, and went back to levels seen before the global financial crisis. The drastic dip between 2000 and 2007 is unlike anything the us has seen since the Great Depression. While the long sweep of technological change has played a leading role in manufacturing's secular employment decline, this slow-moving process cannot explain the precipitous fall after 2000.

Concentrated impact on manufacturing areas

In relative terms, one might think that 3.5 million manufacturing jobs might not be strongly felt in an economy of 150 million workers. Evenly distributed across 3,150 counties, for example, it would represent approximately 1,100 workers per county nationwide, which is not necessarily a large number. But manufacturing jobs are highly geographically concentrated (see Figure 6), and typically in just a few activities in each locale. Consequently, the loss of manufacturing jobs often knocks out central economic pillars in affected locations. Not only are manufacturing workers directly affected, but so are the manufacturing-intensive communities in which they are housed. Examples would include those specialized in the labor-intensive goods in which China gained comparative advantage; places making furniture, games and toys, sporting and athletic goods, plastic products, electronic components, and motor vehicle parts.
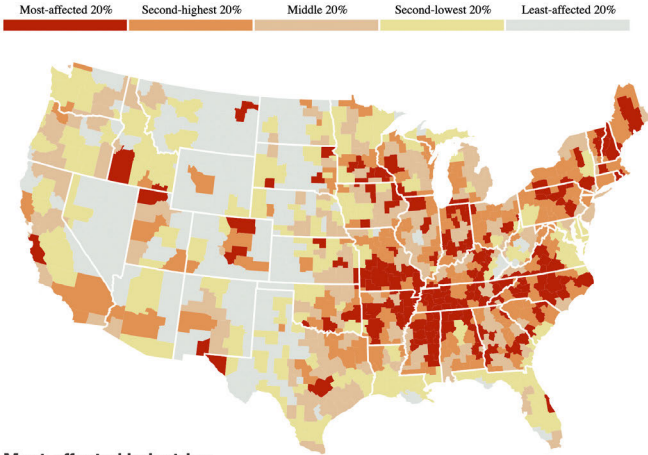
The effects of the trade shock were especially strongly felt in small localities. This has been observed, for example, in West Hickory, North Carolina, the former self-proclaimed "furniture capital of the world," where

the percentage of working age adults in manufacturing fell from 34.1% in 1990 to 15% in 2016 (see Figure 7). During that same period, government transfers per capita to residents rose from $3,400 to $9,600. Another example is Martinsville, Virginia, the former self-proclaimed "sweatshirt capital of the world," where manufacturing employment fell by two thirds, the fraction of adults working fell by a quarter, and government transfers per capita increased by more than 200%.

Figure 6: Concentrated Impact of China Trade Shock, 1990–2007

Most-affected areas of the U.S.

Colors show which areas were most affected by China's rise, based on the increase in Chinese imports per worker in each area from 1990 to 2007.
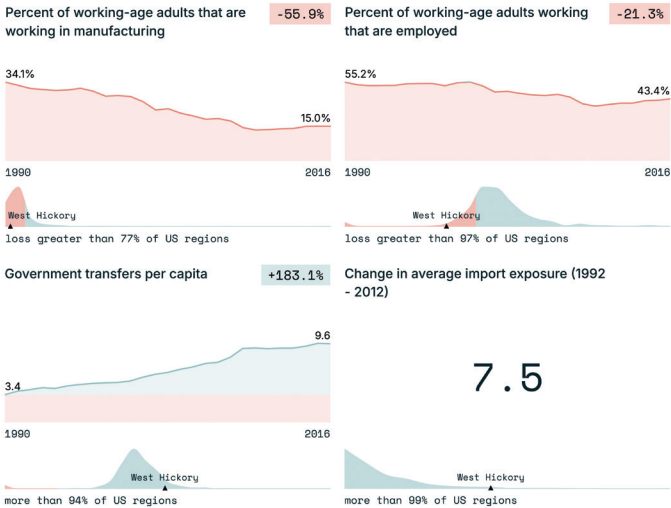

| Most-affected 20% | Second-highest 20% | Middle 20% | Second-lowest 20% | Least-affected 20% |

Most-affected industries

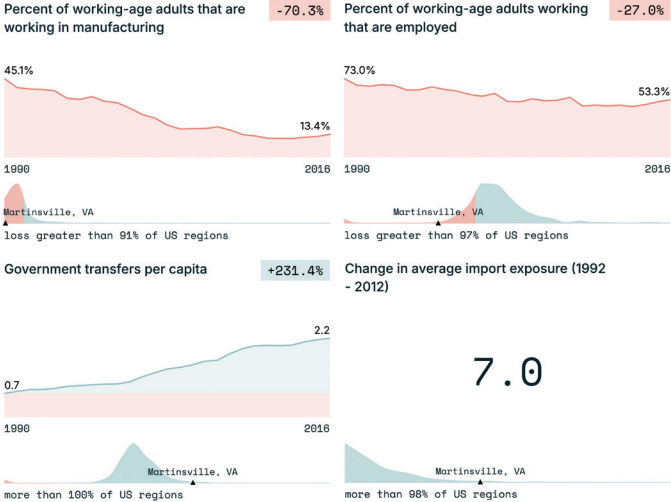| Most-affected industries, based on number of areas		Impact per worker	Most-affected industries, based on number of areas		Impact per worker
Furniture and fixtures	196 areas	$44k	Plastics products	84 areas	$11k
Games, toys, and children's vehicles	114 areas	$488k	Motor-vehicle parts and accessories	79 areas	$12k
Sporting and athletic goods	106 areas	$82k	Electronic computers	68 areas	$207k
Electronic components	87 areas	$65k			

Source: Van Dam and Ma (2016), data from Autor, Dorn, and Hanson (2016a)

West Hickory, North Carolina

Percent of working-age adults that are working in manufacturing   `-55.9%`

34.1%

15.0%

1990   2016

West Hickory
loss greater than 77% of US regions

Percent of working-age adults working that are employed   `-21.3%`

55.2%

43.4%

1990   2016

West Hickory
loss greater than 97% of US regions

Government transfers per capita   `+183.1%`

9.6

3.4

1990   2016

West Hickory
more than 94% of US regions

Change in average import exposure (1992 - 2012)

7.5

West Hickory
more than 99% of US regions

Martinsville, Virginia

Percent of working-age adults that are working in manufacturing   `-70.3%`

45.1%

13.4%

1990   2016

Martinsville, VA
loss greater than 91% of US regions

Percent of working-age adults working that are employed   `-27.0%`

73.0%

53.3%

1990   2016

Martinsville, VA
loss greater than 97% of US regions

Government transfers per capita   `+231.4%`

2.2

0.7

1990   2016

Martinsville, VA
more than 100% of US regions

Change in average import exposure (1992 - 2012)

7.0

Martinsville, VA
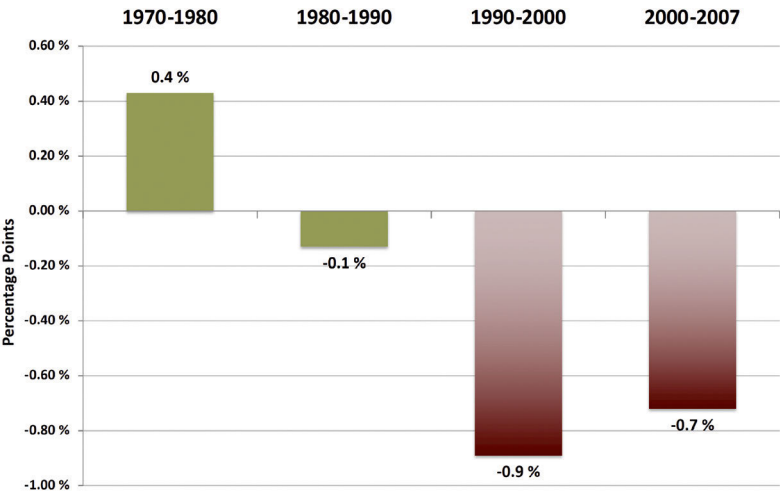more than 98% of US regions

Source: Autor, Dorn, and Hanson (2016b), data from Autor, Dorn, and Hanson (2016a)

Empirical evidence of the China trade shock

Rigorous evidence is presented in Autor, Dorn, and Hanson (2013), which studied the effect of the China trade shock on manufacturing employment. That paper finds that every $1,000 intensification of trade per capita reduces manufacturing employment by about a percentage point (see Figure 8). This reduction is substantial, given that only 12% of the working-age adult population was employed in manufacturing in 1990.

Figure 8: Effects of $1,000 China Trade Shock on Manufacturing Employment per US Adult by Decade, 1970–2007

Note: Change in manufacturing employment, as a percentage of the working age population, that is attributable to a $1,000 per worker increase in imports from China.
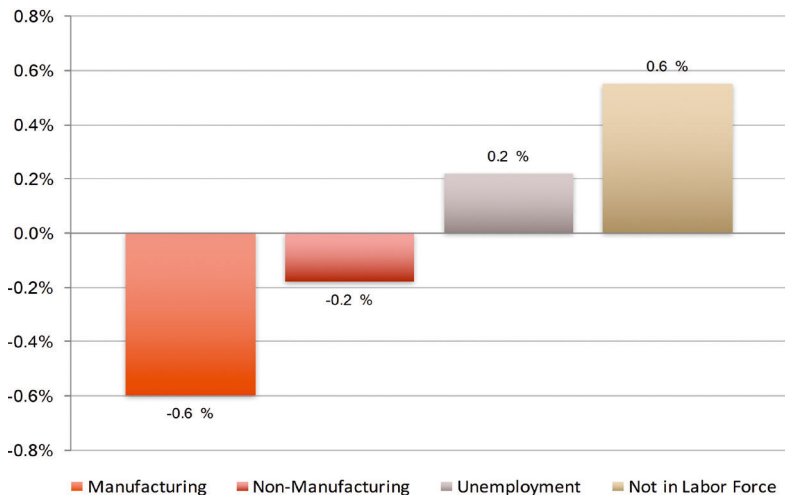Source: Data from Autor, Dorn, and Hanson (2013)

Trade lowers prices by displacing higher-cost domestic production and replacing it with lower-cost foreign production. By implication, these cost savings are inseparable from the displacement of workers who produce these goods domestically. Using data from the UK, a paper by David Dorn and Peter Levell verifies this implication. UK industries like shoes,

garments, appliances, and jewelry had outsized exposure, resulting in sizable price declines (for example, 40% for garments). Industries that were less exposed to imports (e.g., fishery, cars, and newspapers) also had smaller price declines. As predicted by theory and common sense, most of the sectors that had large price declines also had sharp employment declines (e.g., shoes and garments, jewelry, furniture, and appliances, but not so much in fish products). This is generally beneficial for consumers, a large number of whom receive small but meaningful cost savings.

The question that follows – which cannot be answered by theory – is what happens to workers who are displaced from their jobs and to the manufacturing-intensive communities in which they live. And the answer to this question, established by a large body of work focusing on displaced US workers, is that most of this displacement has been accompanied by a rise in unemployment and non-employment rather than an increase in non-manufacturing employment (see Figure 9).

Figure 9: Loss of Manufacturing Employment Not Primarily Offset by Rising Non-Manufacturing Employment, 1990–2007
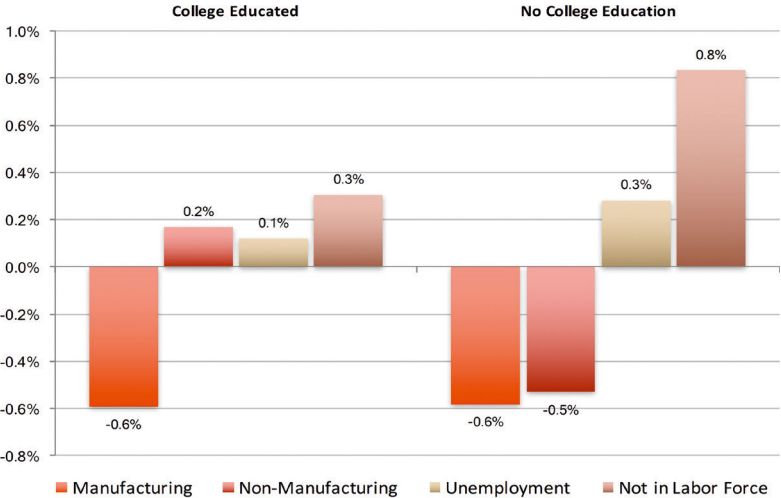

Note: Change in the share of population in each employment category that is attributable to a $1,000 per-worker increase in imports from China during 1990–2007.
Source: Data from Autor, Dorn, and Hanson (2013)

Not surprisingly, college-educated workers were relatively more suc-cessful at relocating out of manufacturing and into other activities, with a slight rise in unemployment (see Figure 10). Conversely, among workers with no college education, a strong decline in manufacturing employment can be observed, alongside a fall in non-manufacturing employment and a very large rise in non-participation in the workforce. Thus, although the relocation out of import-competing sectors was in some sense an inevitable result of rising import penetration, the unhappy surprise is how unsuccessful the ensuing adjustment process was: a substantial fraction of displaced workers did not find alternative employment.

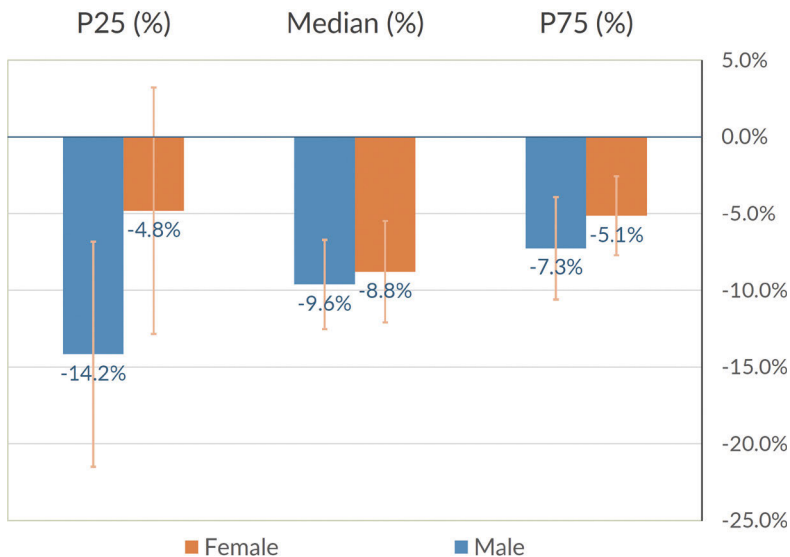**Figure 10: Effects are More Pronounced for Adults with No College Education, 1990–2007**

Note: Change in the share of population in each employment category that is attributable to a $1,000 per-worker increase in imports from China during 1990–2007.
Source: Data from Autor, Dorn, and Hanson (2013)

These consequences extend beyond the realm of employment. As William Julius Wilson stated in his 1996 book *When Work Disappears*, "A neighborhood in which people are poor but employed is different from a neighborhood in which people are poor and jobless. Many of today's

problems in the inner-city ghetto neighborhoods – crime, family dissolution, welfare, low levels of social organization, and so on – are fundamentally a consequence of the disappearance of work." Research by Autor, Dorn, and Hanson (2019) looks at what happens when work disappears. Analyzing the China trade shock, the authors document that it had larger direct effects on the employment and the earnings of low-educated men than on low-educated women, despite the presence of many women in labor-intensive manufacturing, particularly in textiles and assembly (see Figure 11).

Figure 11: Trade Shock Leads to Drop in Lower Tail of Earnings Distribution, Especially Among Men, 1990–2014
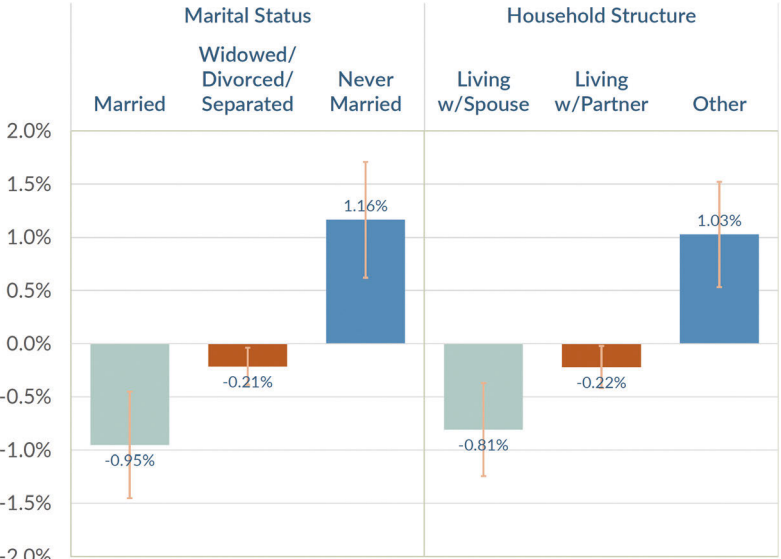

Source: Data from Autor, Dorn, and Hanson (2019)

The trade shock led to a particularly steep drop in the lower quartile of male earnings. From a traditional economic perspective, this was potentially a destabilizing change, considering that traditional family structures are frequently built on a foundation of relatively high-earning male full-time workers, while women are less likely to be employed full-time. Following the trade shock, marriage rates among young women in areas most affected by the trade shock saw a sharp decline (see Figure 12).

The fraction of young women living with a spouse or partner fell, and the fraction living in some other arrangement rose by a corresponding amount. While fertility was not substantially affected, the fraction of children living in poverty, and the share living in single-parent and grandparent-headed households, rose measurably.

Figure 12: Trade Shock Leads to a Fall in Fraction of Women Ages 18–39 who are Married or Living with a Spouse/Partner, 1990–2014
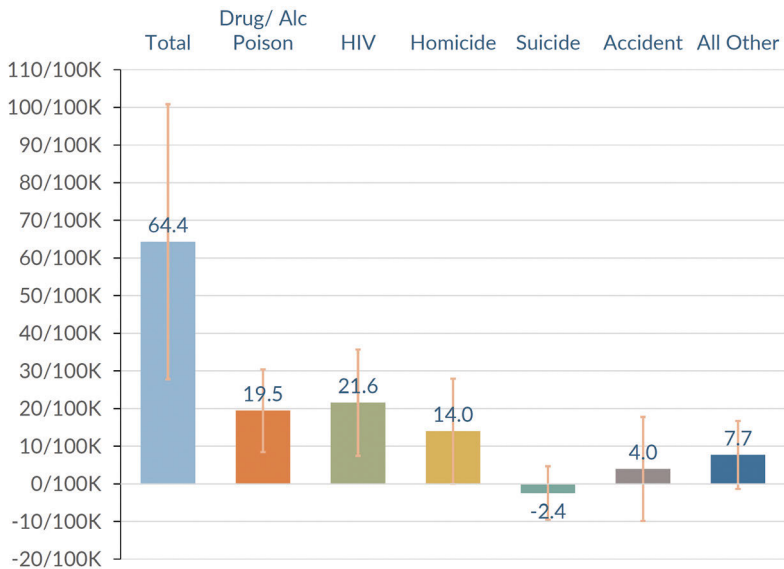

Source: Data from Autor, Dorn, and Hanson (2019)

In summary, the change in earnings resulting from the trade shock arguably catalyzed a change in marital arrangements that subsequently changed children's living circumstances.

Other evidence suggests the potential for further social dysfunction (see Figure 13). Premature mortality due to drug and alcohol poisoning rose in heavily trade-impacted areas. This phenomenon, which the economists Anne Case and Angus Deaton have coined "deaths of despair," coincided with a rise in deaths due to HIV (often related to IV drug use) and homicide, especially among males.

These results point to the fact that work not only provides earnings, it provides structure, identity, self-esteem, friendships, and a foundation on which other social arrangements rest. When work declines, many of the edifices that stand on it tend to crumble. As Krugman wrote in the *New York Times,* "economists, myself included, have tended to underplay the disruptive effects of rapid change… many of us feel that we missed something important about the downsides of rapid globalization" (2021).

Figure 13: Trade Shock Increased "Deaths of Despair": Mortality per 100K among Adults Ages 20–39, 1990–2015
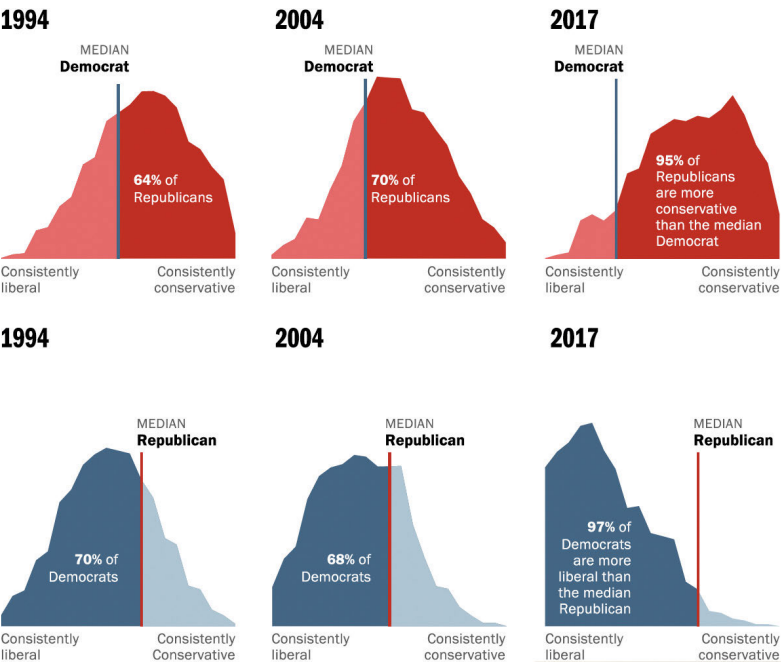

Source: Data from Autor, Dorn, and Hanson (2019)

The following figure from the Pew Research Center is potentially useful for understanding the political consequences of the China trade shock. The infographic (see Figure 14) shows that in 1994 only 64% of Republicans were to the right of the median Democrat and 70% of Democrats were to the left of the median Republican. While this skew may seem large, remember that if these groups had the same distribution of political preferences, still half of Democrats would be more liberal than the median Republican and

half of Republicans would be more conservative than the median Democrat. Rolling the clock forward to 2017, however, we can see the coming apart of political consensus, with 95% of Republicans now more conservative than the median Democrat, and 97% of Democrats more liberal than the median Republican.

Figure 14: Political Polarization: Distribution of Republicans and Democrats on a 10-item Scale of Political Values, 1994–2017
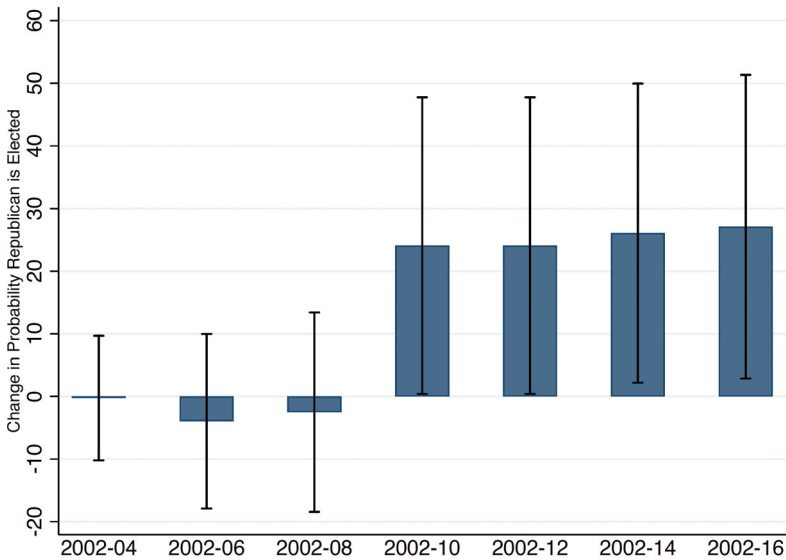

Source: Pew Research Center (2017)

This increase in political polarization between 1994 and 2017 motivated me and my coauthors David Dorn, Gordon Hanson, and Kaveh Majlesi to ask the simple question: "has the trade shock contributed to this polarization?" Studying the outcome of Congressional elections, we do find evidence that the places more subjected to trade shocks became more likely to elect Republicans (see Figure 15), but not just any Republicans:

we observe a decline in moderate Republicans and moderate Democrats, and a rise in conservative Republicans (see Figure 16). Thus, the trade shock had the effect of hollowing out the middle of the political spectrum and shifting weight towards one tail in the most affected places. Evidence shows that the beneficiaries of this hollowing out were mostly, but not exclusively, on the right side of the political spectrum. Based on this evidence, we believe that the trade shock, through its disruptive political consequences, contributed to the rise of the highly conservative Tea Party movement in the House of Representatives. We stress that the trade shock was not the primary or exclusive cause of these outcomes but rather a catalyst.

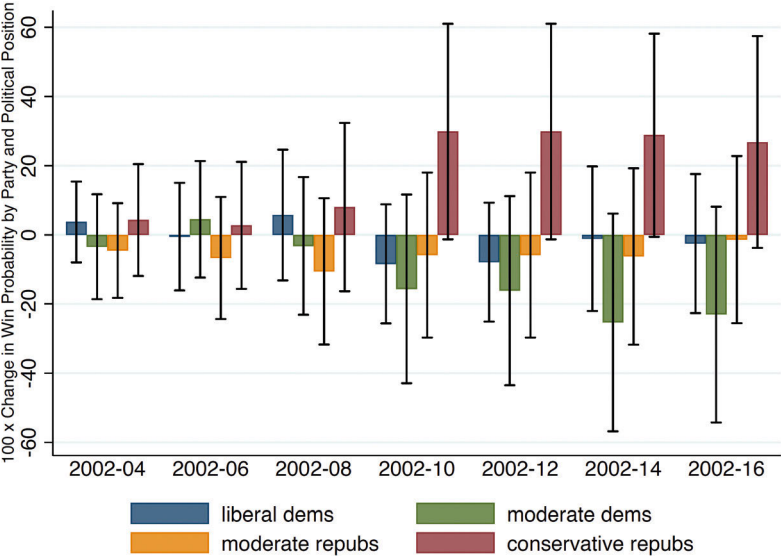**Figure 15: Trade Shock Raised the Odds that Republicans Win House Seats, 2002–2016**

Source: Autor, Dorn, Hanson, and Majlesi (2020)

A natural question is whether these same shocks contributed to Donald Trump's unexpected presidential victory in 2016. The evidence suggests that the answer is yes. In a regression estimate, a 10% notional reduction of the trade shock would hypothetically have turned Michigan blue in

the 2016 presidential election, and a 25% reduction would hypothetically have turned Wisconsin blue. A 50% reduction would, according to these estimates, have brought Pennsylvania to Democrats. This is, of course, a hypothetical exercise and should not be taken as definitive. The 2016 presidential election was an incredibly close one, meaning that many factors could have tipped the outcome in either direction. As it happened, some of the manufacturing-intensive local labor markets where these trade shocks were particularly pronounced were in swing states where election outcomes were relatively close to a toss-up. As such, the outcomes of these elections may have been swayed by the China trade shock. And of course, the political fallout continues to the present day.

Figure 16: In House of Representatives, Trade Shock Wipes Out Moderate Republicans and Democrats, Ushers in Conservative Republicans, 2002–2016

Source: Autor, Dorn, Hanson, and Majlesi (2020)

The United States would ultimately have shed its China-exposed jobs and sectors, even without the trade shock. High-wage industrialized countries generally are not competitive in labor-intensive industries, such as textiles or assembly of toys and dolls. However, the trade shock accelerated that process dramatically, and the rate of change is a crucial factor when considering the ability of people and places to effectively adjust to changed circumstances.

The "China shock" was also a catalyst of US polarization. But it was not the exclusive cause. We know this because similar political forces are at play in other liberal democracies that were not exposed to the same intensity of shock. One can see the rise of populist candidates, for example, in the Netherlands, Sweden, Germany, and France. Indeed, Germany's labor market was arguably a substantial net beneficiary of China's rise, but this has not insulated Germany from political polarization.

Something that has received insufficient attention is the degree to which the NAFTA trade policy of 1994 was a prequel to the China trade shock, both in its economic and political consequences. An in-press paper by Choi, Kuziemko, Washington, and Wright shows how NAFTA policies had both important employment effects and profound political consequences. By the time the Clinton administration was pushing NAFTA through Congress, blue-collar voters in the South were already hanging on to the Democratic Party by a thread, and that thread was trade protection and union protection. Cutting that thread severed that group of voters from the Democratic Party. Although those voters were neither politically nor ideologically aligned with the liberal values of the Democratic Party at that point, they were aligned with the party on worker protection. And so, arguably, the NAFTA policy provided momentum to this slow-moving but now extremely visible parting of ways between Democrats and blue-collar voters.

The China trade shock, as we knew it, is now over, however. China is in a different era economically, and the US and China are in different eras strategically. We are no longer fighting about who makes textiles and assembles dolls. Those were the easy days.

It is finally useful to ask what should we have foreseen about the consequences of the China trade shock, and what can only be understood in hindsight? The economic policy that helped to accelerate the trade shock – China being granted Normal Trade Relations (PNTR) status with the US in 2000 and gaining WTO membership in 2001 – was propelled by a belief in Washington that bringing China into the world trading system would encourage this vast, rapidly developing and increasingly powerful country to join the fold of democratic nations. This did not occur. If, hypothetically, China had not been admitted to the WTO and had not been granted PNTR, and yet were we facing similar geopolitical circumstances as we do today, many experts (likely myself included) would blame current US tensions with China on the US having barred China from fully entering the world trading system two decades earlier. The lesson, I think, is that the present poor state of US-China relations was not readily forecastable. Had we made different decisions two decades earlier, we might draw the wrong lessons from them today.

What economists and policymakers could certainly have better anticipated is the deep economic distress that China's entry into the world trading system would ultimately mean for manufacturing-intensive communities in the United States. Had policymakers applied such foresight, they could have enacted social insurance policies and public investment programs to insulate, compensate, and retrain workers, to buffer the transition for trade-affected communities, and broadly, to reduce economic dislocation while spurring new employment. Absent such policies, the ensuing economic scars were deeper and slower to heal. While we could not have fully anticipated the scale, shape, or political trajectory of the China trade shock, the disruptive impact of trade openings on workers employed in import-competing sectors has long been understood. That the US failed to foresee and ameliorate these impacts is a homegrown policy failure, not a Chinese import.

Autor, David. 2017. "Economic and Political Consequences of China's Rise for the United States: Lessons from the China Shock." *Institute for Fiscal Studies, The Royal Society, London*.

Autor, David. 2022. "The Enduring Consequences of the China Trade Shock: Myths and Measurement." *Nobel Symposium on Inequality*.

Autor, David, David Dorn and Gordon H. Hanson. 2013. "The China Syndrome: Local Labor Effects of Import Competition in the United States," *American Economic Review*, 103(6), pp. 2121–2168.

Autor, David, David Dorn and Gordon H. Hanson. 2016a. "The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade," *Annual Review of Economics*, 8(2016), pp. 205–240.

Autor, David, David Dorn and Gordon H. Hanson. 2016b. Regional Economics, "Chapter 2: Globalization and the China Trade Shock," *Malcolm Wiener Center for Social Policy, Harvard Kennedy School*.

Autor, David, David Dorn and Gordon H. Hanson. 2019. "When Work Disappears: Manufacturing Decline and the Falling Marriage-Market Value of Men," *American Economic Review: Insights*, 1(2), pp. 161–178.

Autor, David, David Dorn and Gordon H. Hanson. 2021. "On the Persistence of the China Shock," Brookings Papers on Economic Activity, Fall 2021, pp. 381–447.

Autor, David, David Dorn, Gordon H. Hanson and Kaveh Majlesi. 2020. "Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure," *American Economic Review*, 110(10), pp. 3139–3183.

Case, Anne and Angus Deaton. 2020. *Deaths of Despair and the Future of Capitalism*. Princeton University Press.

Choi, Jiwon, Ilyana Kuziemko, Ebonya L. Washington and Gavin Wright. 2021. "Local Economic and Political Effects of Trade Deals: Evidence from NAFTA," NBER Working Paper 29525, forthcoming *American Economic Review*.

Dorn, David and Peter Levell. 2021. "Trade and Inequality in Europe and the United States," *IFS Deaton Review of Inequalities*, November 16, 2021. https://doi.org/10.5167/uzh-215628

Grewal, David Singh. 2022. "A World-Historical Gamble: The Failure of Neoliberal Globalization," *American Affairs Journal*, VI(4), pp. 87–121.

Krugman, Paul. 1997. "What Should Trade Negotiators Negotiate About?," *Journal of Economic Literature*, 35(1), pp. 113–120.

Krugman, Paul. 2021. "Krugman Wonks Out: The China Shock and the Climate Shock," *New York Times*, April 23, 2021.

Krugman, Paul and Maurice Obstfeld. 2008. *International Economics: Theory and Policy*, 8th Edition. Pearson, College Division.

Pew Research Center. 2017. "The Partisan Divide on Political Values Grows Even Wider."

Rodrigue, Jean-Paul et al. 2020. The Geography of Transport Systems, Hofstra University, Department of Global Studies & Geography.

Van Dam, Andrew and Jessica Ma. 2016. "The Parts of America Most Vulnerable to China." *Wall Street Journal*. https://graphics.wsj.com/china-exposure/

Wilson, William Julius. 1996. *When Work Disappears: The World of the New Urban Poor*. Vintage Press.