



24-10 Did Supply Chains Deliver Pandemic-Era Inflation?

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INTRODUCTION

The question of whether supply chain breakdowns were a significant cause of pandemic-era inflation has drawn attention, both in terms of supply chain resilience and macroeconomic policy. In the former case, if supply chain breakdowns drove inflation, that might strengthen the argument for capacity expansion, reshoring, or other remediation. In the latter case, if supply chains were not the cause, then one must look more vigorously at other potential explanations, such as monetary or fiscal policy.

This Policy Brief argues that supply chain breakdowns were *not* a principal cause of the inflation of recent years. The allegation that they were is a compound claim that goes as follows: (1) supply chains did not perform as they ought to; and (2) that failure was an important cause of inflation. The claim helped spur serious efforts through legislation, regulation, and executive branch action to push for “resilient” supply chains, where resilience presumably means the ability to handle a similar shock with significantly less disruption.

I largely focus on US trade in containerized goods and shows that, within months of the pandemic's onset, the *quantities* of goods delivered increased significantly. These real increases were seen in broad categories such as overall imports of goods, flow of goods through ocean ports, and in personal consumption expenditures on durable and nondurable goods. They were also mirrored in more disaggregated categories. There were increases relative to both prepandemic levels and trend lines. Both shipping and consumption of goods were well above levels that might reasonably have been anticipated from prepandemic data.

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None of this is to deny the sharp increases in inflation, the price of shipping, and the accompanying delays and empty shelves. Average times for moving container cargo from Asia to North America went from roughly 1.5 months prepandemic to almost 4 months in early 2022. Shipping prices also rose **dramatically**. But in the presence of significantly increased quantities delivered, those are suggestive of a large positive demand shock. **Real personal consumption of durable goods, as an extreme example, rose 32.1 percent from February 2020 to March 2021. Goods consumption levels remained elevated into 2023 and beyond, even as shipping delays and price hikes dissipated.**

The Policy Brief concludes with a brief discussion of supply chain resilience. For most businesses there are limits to how quickly they can expand in the short run. **Maintaining excess capacity to cover extraordinary shocks is prohibitively expensive.** While it may be worthwhile to introduce efficiencies into supply chains and aim for some increased elasticity of supply, the more likely conclusion is that **the goal of avoiding inflation and shortages is better met through improved demand management.**

DEFINING TERMS

To bring data to bear on the question, we need precision on several key terms: inflation, supply chain, and demand. Despite very frequent usage, each is subject to multiple interpretations.

Inflation

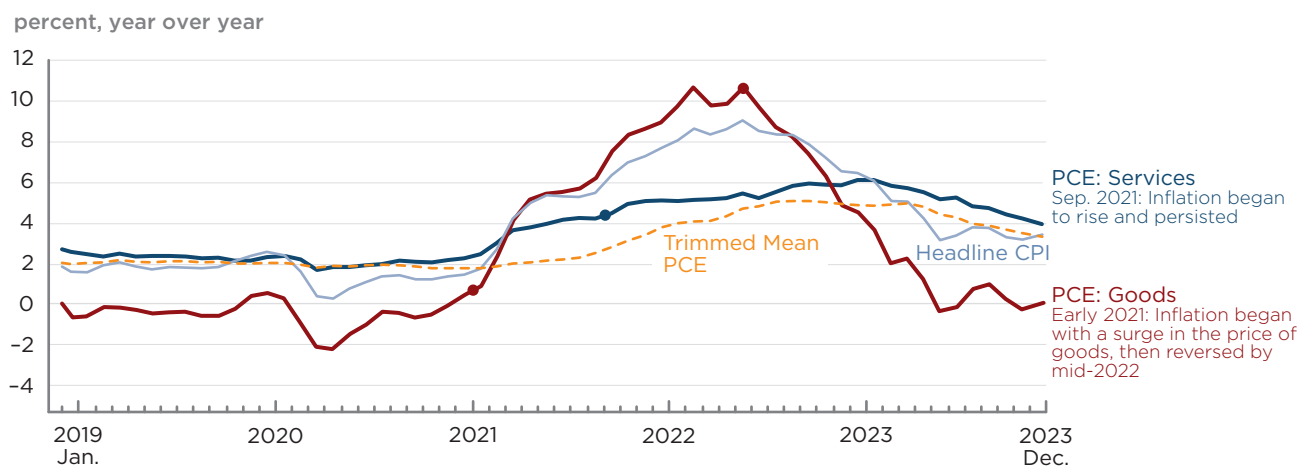
While there is little argument over whether the US economy experienced unusually high inflation in recent years, there is substantial room for debate over how high, the nature of that inflation, and how rapidly it has receded.

Figure 1 shows two broad measures of inflation and two partial ones, all expressed on a 12-month basis.

The broad measures are the full Consumer Price Index (**Headline CPI**, in light blue) and the Trimmed Mean Personal Consumption Expenditure (TM PCE, dotted yellow) put out by the **Federal Reserve Bank of Dallas**. While not the only broad measures, these two illustrate some of the choices to be made in measuring inflation. First, CPI and PCE use the prices of different bundles of goods. Second, CPI as shown is a full measure, including volatile components such as food and energy. TM PCE, in contrast, attempts to remove the most volatile parts and come up with a steadier depiction of underlying inflation trends. As seen in the graph, they tell different stories about the inflation experience. The CPI line soars higher but drops faster. As it plunges toward the central bank's 2 percent target, it gives the impression that the battle against inflation is nearly won. TM PCE was slower to rise, didn't hit the same heights, but has also been slower to subside.

The other two lines divide the world of personal consumption expenditures into goods (red) and services (dark blue). The key point here is that **the onset of serious inflation in 2021 began with a surge in the price of goods, while services inflation remained docile until roughly September of that year.** More recently, though, roles have reversed and goods prices have once again verged on deflation (their persistent state prepandemic) while services inflation has been

Figure 1
US inflation measures, December 2018 to December 2023



CPI = consumer price index; PCE = personal consumption expenditures

Sources: Bureau of Labor Statistics, Bureau of Economic Analysis, and Federal Reserve Bank of Dallas, via [Federal Reserve Economic Data](#).

more persistent. In whatever version we choose, these are the developments we are trying to explain.

Supply Chains

The general idea underpinning the modern supply chain is that goods go through multiple stages of production. With such a broad approach, potentially relevant influences could encompass anything from the effect of domestic labor availability on factory output to the ability to move commodities across oceans and through ports. In this paper, we will largely retain this broad definition, with extra attention paid to international sourcing, which is frequently the subject of policy concern.

Even when focusing on international supply chains, there are at least three systems that are mostly independent from one another in operation but can be referred to as “supply chains”: containerized goods; energy; and agriculture and commodities. The independence of operation comes from the different equipment used for transport and handling: a large container ship vs. an oil tanker vs. bulk carriers. This paper will focus on trade in containerized goods.¹

Demand

In part because of the policy- and data-driven focus on the role of containerized goods supply chains, “demand” will generally mean demand for those goods being moved through containers. This is of course a distinct subset of economic activity. According to World Bank estimates, services as a share of global

¹ The narrowing here can be important. While this paper focuses predominantly on inflation in the United States, a study of Europe’s experience would almost certainly give more weight to the energy supply interruptions that accompanied the conflict in Ukraine starting in February 2022.

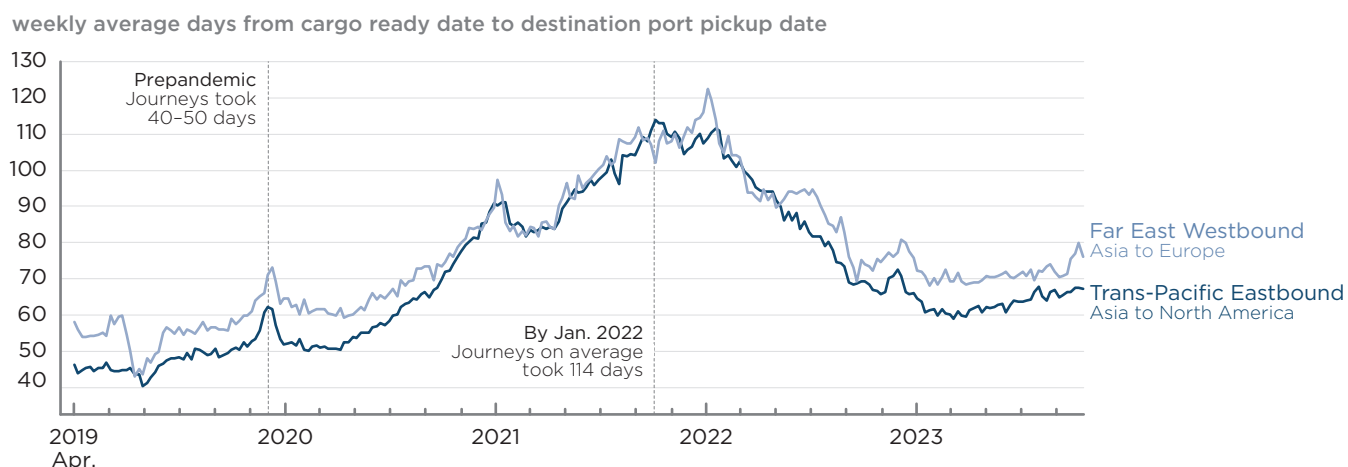
value added ranged from 65.3 percent to 61.7 percent of GDP over the period 1995–2022.² It is interesting to note that the high and low values for the series occurred in 2020 and 2022, respectively. The fall in the share of services during the pandemic period helps point to the importance of goods as the complement. Thus, unless otherwise specified, *demand* refers to goods demand, with subcategories described below.

WHY ARE SUPPLY CHAINS A LEADING SUSPECT FOR INFLATION?

There are more direct reasons for analysts to look at supply chains. If the role of supply chains is to deliver the goods people and businesses want in timely fashion and at a reasonable price, that did not happen over this period.

Figure 2 shows Flexport’s Ocean Timeliness Indicator, which measures the average amount of time it took to move containers from their cargo-ready date to their pickup from the destination port, after traversing two of the world’s major trade lanes. The Trans-Pacific Eastbound (TPEB, in dark blue) series measures the time required to carry goods from Asia to North America, while the Far East Westbound (FEWB, in light blue) does the same for the Asia to Europe route. The chart shows that prepandemic journeys across the Pacific were roughly of 40–50 days’ duration. At the worst of the crunch—the week ending January 9, 2022—the average journey was 114 days.

Figure 2
Flexport Ocean Timeliness Indicator, April 2019 to January 2024



Note: Flexport has subsequently changed the calculation of this indicator. This is the version that was current as of January 2024.

Source: Flexport.

The delays in moving goods from factories to domestic distribution centers was highly problematic for businesses that had come to rely on “just in time” inventory practices. It meant increasingly bare shelves. How could retailers see their dwindling stock without thinking about raising prices?

2 World Bank, “Services, Value Added (% of GDP)” (accessed February 23, 2024).

Then there was the unforgettable difficulty of getting key conveniences of modern life, such as toilet paper. That seemed further evidence of supply chain failure—hadn't the paper product shelves always been full before?

Then there were the images of over 100 container ships queueing outside the largest port in the United States—Los Angeles and Long Beach. A *Wall Street Journal* [story](#) described this backup as being “at the heart of U.S. supply chain congestion during the COVID-19 pandemic.”³ Not only did this seem a stark shift from prepandemic practice, but surely the inability to process these containers in a timely fashion constituted a failure.

If one combines visible delays with goods shortages and then the onset of inflation concentrated in the goods sector (roughly one-third of the US economy), there seemed to be a strong *prima facie* case that supply chain breakdowns had led to inflation. This conviction likely strengthened when the shortages, backups, and delays subsided at the same time that goods inflation seemed to drop away.

SUPPLY OR DEMAND?

In any market, if we observe a spike in prices, basic analysis will tell us that it could result from a contraction of supply, an expansion of demand, or some combination of the two. If there is some such shock and prices do not rise quickly enough to clear markets, we are likely to see shortages. Simply knowing that prices increased or shortages appeared, however, cannot help us determine which was the cause.

Fortunately, this same basic analysis offers a ready means of distinguishing. A supply contraction will result in decreased quantities, while a demand expansion will result in increased quantities.⁴ Thus, we turn our attention to quantities. This section explores the experience of quantity during the pandemic era. It works through multiple measures. First, we look at the quantity of goods consumed, paying attention to both subcategories and celebrated cases that seemed to show important supply chain failure—semiconductors and automobiles. Then we will turn to quantities of goods imported, both through all modes and then with a look at port volumes.

Goods Consumption

Figure 3a shows inflation-adjusted (real) US personal consumption expenditures (PCE) on goods from January 2007 to November 2023.⁵ The solid red line depicts monthly expenditures through December 2019, the eve of the COVID shock.

A first point to note is that consumption sagged at the beginning of the graph with the onset of the global financial crisis. After reaching a local peak in

3 Paul Berger, “Southern California’s Notorious Container Ship Backup Ends,” *Wall Street Journal*, October 21, 2022.

4 Of course, these are not mutually exclusive. One could have simultaneous shocks to demand and supply. The quantity measure will then tell us which dominated. The central thrust of this paper will be to determine which of these shocks had the dominant effect on inflation.

5 This section draws on the author’s written testimony before the Senate Budget Committee on January 24, 2022. The time span covered by figure 3 was the length of the available data series for this variable.

Figure 3a
US real personal consumption expenditures (goods), January 2007 to November 2023

billions of chained 2017 dollars, monthly, seasonally adjusted annual rate

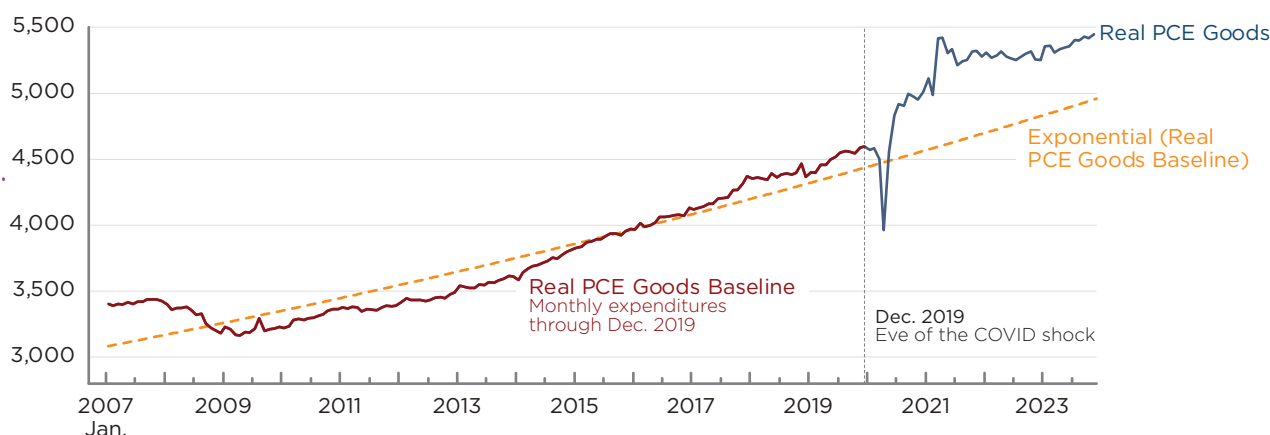
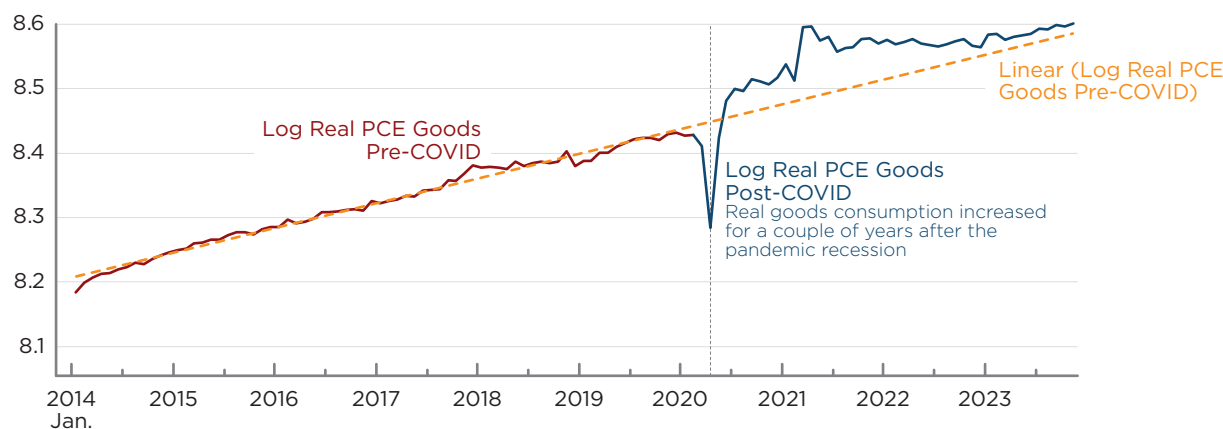


Figure 3b
Log real PCE goods



PCE = personal consumption expenditure

Sources: Bureau of Economic Analysis via [Federal Reserve Economic Data](#) and author's calculations.

September 2007, goods consumption fell to a trough in April 2009. It did not regain its September 2007 level until February 2012, over four years later.

The aftermath of the global financial crisis is relevant when we think about the expectations that went into setting supply chain capacity at the beginning of 2020. One approach would have been to look at the preceding 13 years, take the average growth rate, and assume it would apply going forward. That's what the dotted line does. An alternative approach would have been to suppose, with an oncoming recession that started with an even larger and more sudden plunge in economic activity, that it might take four years to recover prerecession consumption levels. **In this case, the expectation would be to regain February 2020 levels by February 2024.** This second, more cautious, approach might have seemed even more appropriate as we moved into the spring of 2020 and goods consumption plunged.

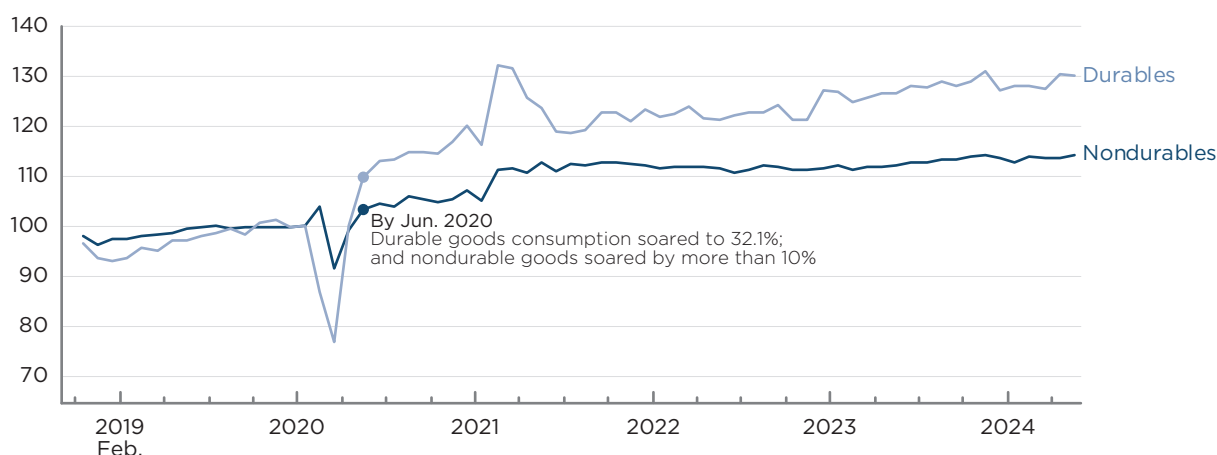
Figure 3b shows that the quantity of goods consumed increased substantially above pre-pandemic levels and above trend. The jump was even more dramatic off the low of the short-lived pandemic recession. Whether or not PCE is *currently* above trend can vary with the way one specifies the trend line. The robust result, however, is that **there was a measurable increase in real goods consumption for a couple of years after the pandemic recession.**

Figure 4 offers a decomposition of this goods demand into durables and nondurables, where the former are products that are expected to last three years or more.

Figure 4

US personal consumption expenditures on goods, November 2018 to June 2024

index, February 2020 = 100, monthly, seasonally adjusted annual rate



Sources: Bureau of Economic Analysis via [Federal Reserve Economic Data](#) and author's calculations.

Beyond the decomposition, figure 4 indexes consumption to February 2020 levels, allowing easy inspection of the magnitude of the swings. During the 2010s, variation in these series was minimal, consistent with the flat section in the pre-pandemic portion of the chart. We can also note the extreme magnitude of the initial COVID shock: nondurables consumption fell by 8.5 percent to April 2020; durables fell by 23.3 percent.

Nonetheless, any assumption of a slow recovery would prove to have been far off. **Instead of taking four years to regain pre-shock levels, both categories were there by May or June of 2020!** They then soared to the point where by March 2021, durable goods consumption was up 32.1 percent above its February 2020 level. The gain in nondurable goods consumption of more than 10 percent would look impressive if not sitting next to the durables line.

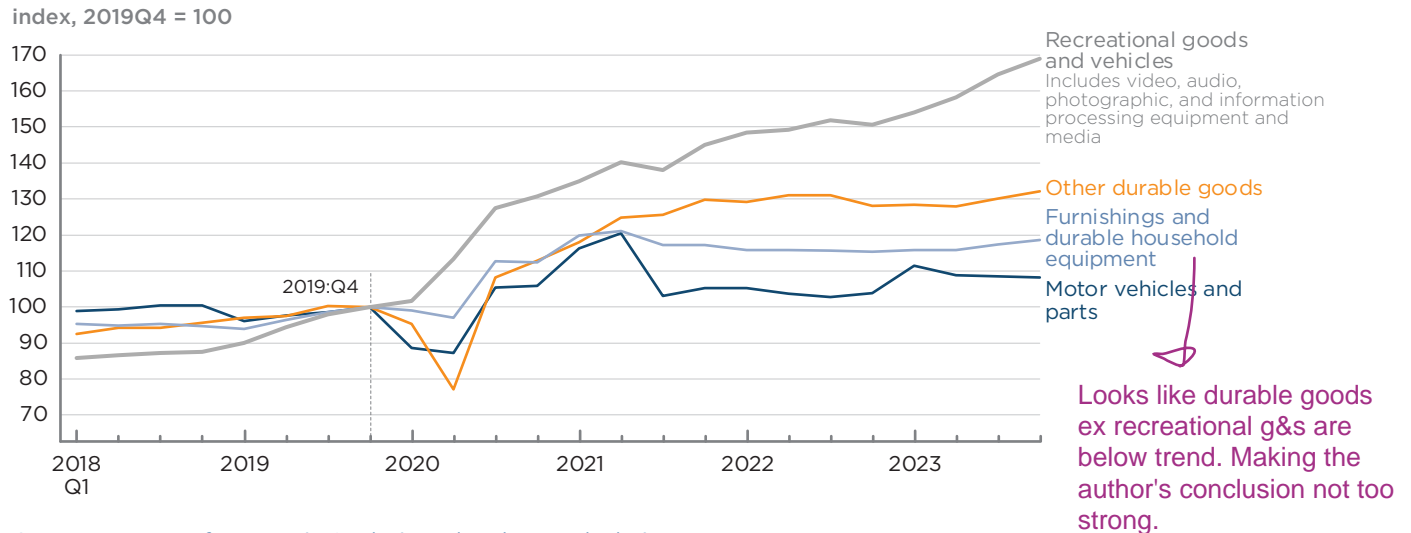
Thus, figures 3 and 4 show that, **rather than contracting, the level of goods consumption dramatically expanded during the period that supply chains were in crisis (figure 2) and inflation was emerging (figure 1).** All of these goods had to be supplied either out of inventory or through supply chains.

Durable Goods Detail

Figure 4 points to durable goods as the more extreme example of a surge in goods quantity consumed. Figure 5 breaks down quarterly durable goods consumption into its constituent subcategories, with levels benchmarked to 100 in 2019:Q4.

Figure 5

Real personal consumption expenditures: Durable goods categories, 2018Q1 to 2023Q4



Sources: [Bureau of Economic Analysis](#) and author's calculations

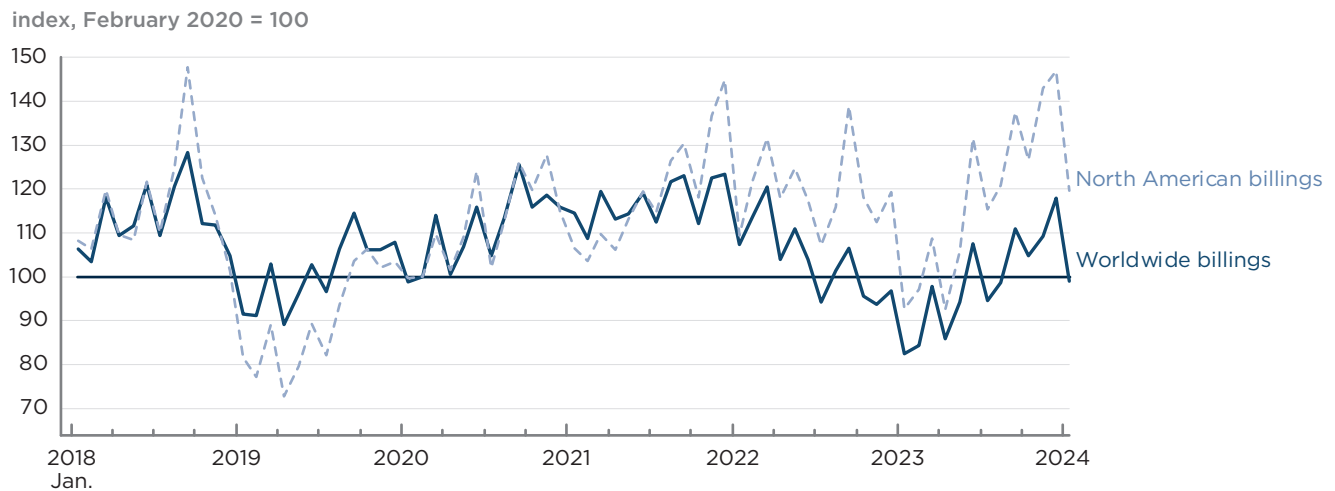
While each subcategory increased, there were stark differences. *Recreational goods and vehicles*, which includes “video, audio, photographic, and information processing equipment and media” along with sporting equipment and recreational vehicles, has grown at an astonishing pace. That pace can overshadow impressive and persistent growth in *Furnishings and durable household equipment* and *Other durable goods*.

The only candidate for laggard would be *Motor vehicles and parts*, though after 2020:Q2, its low point was 2022:Q3, when consumption was up “only” 2.8 percent above the 2019:Q4 level. Though that number still shows increased quantities throughout, it provides an opportunity to focus on two linked sectors that generated substantial concern about supply chain performance through the pandemic period: autos and semiconductors.

One can calculate that real PCE for *New motor vehicles* was up 13.7 percent from the 2018–19 average to the average for 2020:Q3–2022:Q2. One thing not shown in this graph is that there were significant shifts in composition, with new cars down and new trucks up. That introduces difficult questions about composition effects, which could be due either to shifting consumer tastes or to production difficulties. At the aggregate, however, there was no notable decline in real consumption of motor vehicles.

The linkage between autos and semiconductors comes because both seemed to be in short supply and because the auto sector supply difficulties were, in significant part, linked to the inability to obtain the requisite semiconductor chips

Figure 6
Real semiconductor billings, January 2018 to January 2024



Sources: [World Semiconductor Trade Statistics Blue Book Data](#), and author's calculations.

for production. Both modern gas-powered autos and especially electric vehicles are increasingly reliant on semiconductors.

Before concluding that auto supply chain failure was derived from semiconductor supply chain failure, figure 6 depicts both worldwide and North American billings for semiconductors. In the absence of a more precise alternative, the nominal series are deflated by the component of the US producer price index that covers “Intermediate Demand by Commodity Type: Processed Goods for Intermediate Demand.”

The solid line, worldwide billing, does not show a notable decline for the era of supply chain difficulties and accelerating goods inflation. This is suggestive, rather than dispositive, as these are not homogeneous goods and there is evidence of shifts in product mix.

So what impeded the auto industry from meeting its semiconductor needs? The story is worth delving into because it illustrates some of the difficulties with the broad interpretation of supply chain resilience that will be addressed in the next section.⁶ Automakers need to order semiconductors in advance. As the pandemic recession began, they saw a fall in auto demand (see figure 7) and anticipated, informed by their experience in the last recession, that it would take an extended period for sales to recover. They thus cut their orders for semiconductors.

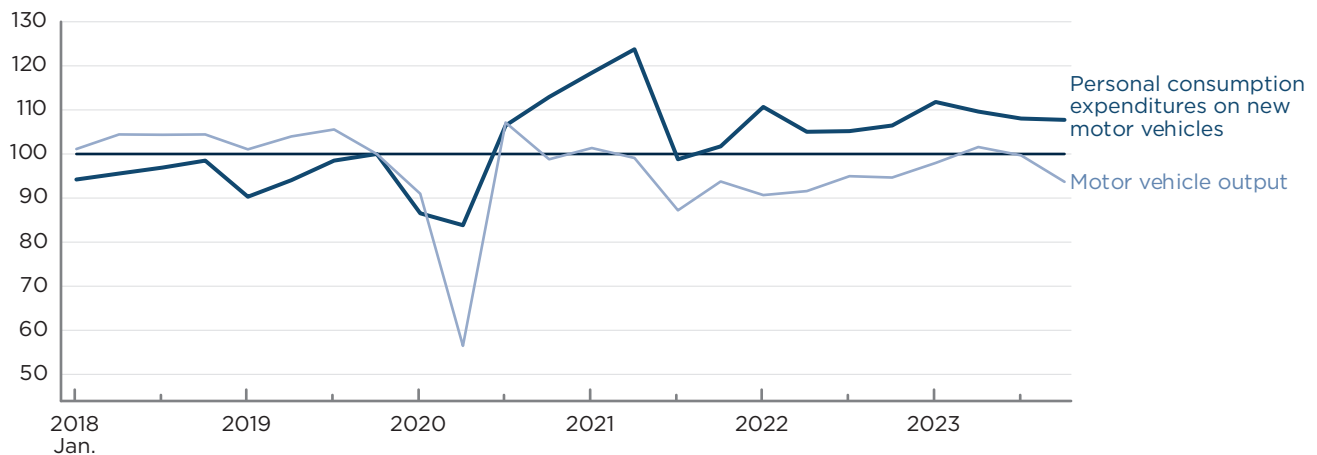
When auto sales recovered quickly and inventories began to shrink, the automakers returned to the chip makers and asked to reinstate or expand their orders. However, semiconductor order books had already been filled. One facet of the increased use of devices and electronics as people worked and entertained themselves from home was a surge in demand for the chips that ran the devices. Thus, we simultaneously had a significant expansion of semiconductor production and a shortage of the variety of chips required by automakers.

6 This draws on William Boston et al., “How Car Makers Collided with a Global Chip Shortage,” *Wall Street Journal*, February 12, 2021.

Figure 7

Real quarterly US new motor vehicle production and consumption, January 2018 to October 2023

index, 2019Q4 = 100



Source: [Bureau of Economic Analysis](#), Table 7.2.6B, Real Motor Vehicle Output, Chained Dollars.

While automakers had faced a very difficult forecasting task in early 2020, there is an important distinction to be drawn between a forecasting failure that resulted in supply being unable to meet strong demand and a supply chain breakdown.

This is a very good point

Imports

To this point, the discussion has focused on levels of US consumption without regard to whether sourcing was domestic or international. Yet the distinction has proven important in policy discussions. Policies such as a push for *nearshoring* explicitly question the reliability of geographically dispersed supply chains. In this section, we take the same approach of looking for quantity increases or decreases and apply it to trade data.

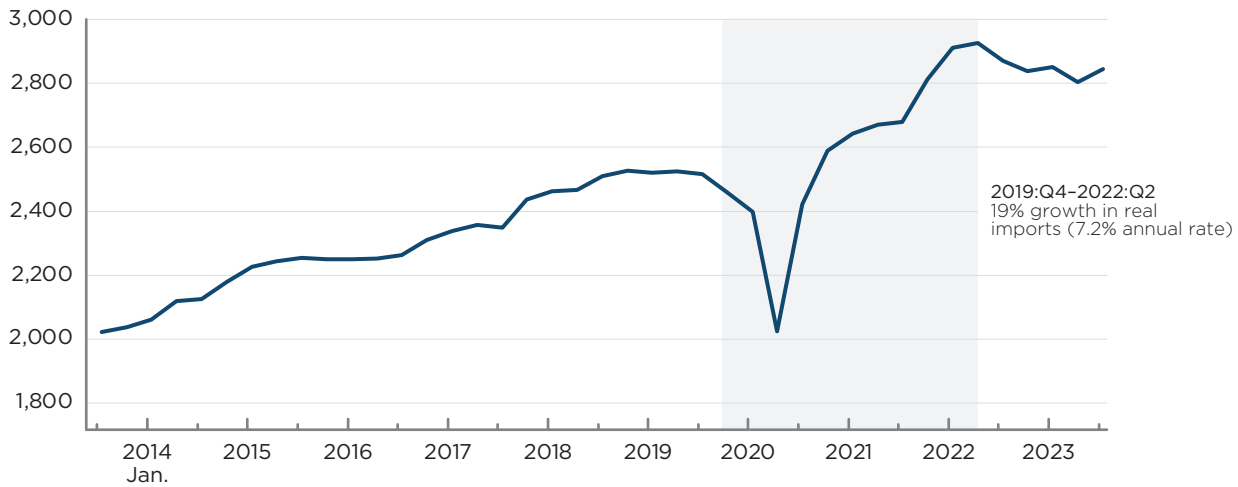
Figure 8 looks at the volume of goods entering the United States. Note that in the fourth quarter of 2019, real goods imports were below the levels of the first quarter of 2018. Thus, over that two-year period, an observer might have concluded that real import growth had tapered off entirely. Yet from 2019:Q4 to the peak in 2022:Q2, real imports grew 19 percent, or at a 7.2 percent annual rate. That dramatic growth ignores the collapse in imports in the first two quarters of 2020.

While there were indisputably instances in which factories or port terminals or other links in supply chains were disrupted by disease or disease-prevention measures, the net effect was a very substantial expansion of supply. We can see another version of this through container volumes passing through the top US ports, shown in figure 9.

The unit of measurement is twenty-foot equivalent units (TEUs), a standard measure of freight volume. The port volumes are stacked from largest average volume (Los Angeles-Long Beach) to smallest among this group (Oakland). The data are monthly and not seasonally adjusted and ocean freight is a cyclical business. Nonetheless, if we compare the total throughput of these ports after

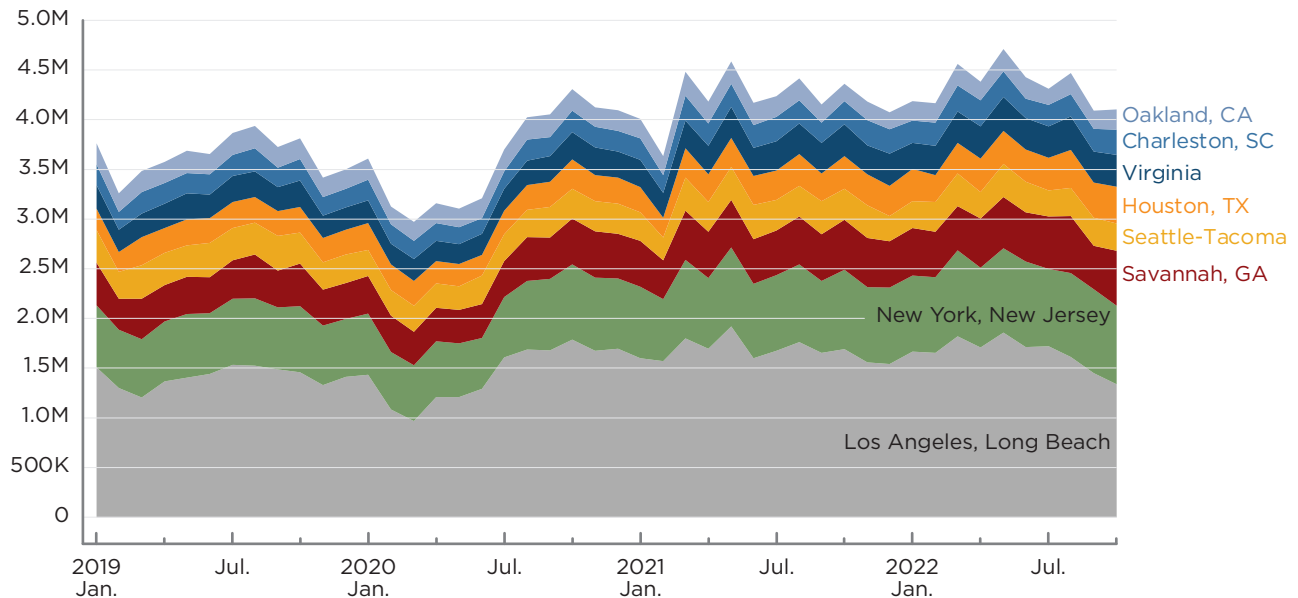
Figure 8
Real US imports of goods, July 2013 to July 2023

billions of 2017 dollars, quarterly at a seasonally adjusted annual rate



Source: Bureau of Economic Analysis via [Federal Reserve Economic Data](#).

Figure 9
Major US port monthly TEUs handled, January 2019 to October 2022



TEUs = twenty-foot equivalent units

Source: [Bureau of Transportation Statistics](#).

July 2020, there is only a single month in which volume dips below the *maximum* of the period from January 2019 to July 2020 (max = 3.94m). That local minimum was in February 2021, when volume dipped to 3.63m. But February volumes are frequently low given holidays in Asia. Thus, a rough version of a

seasonal adjustment shows that February 2021 volume was up 11.5 percent over February 2019.⁷

Aside from that lone month, *every single month* from August 2020 showed more port throughput than the maximum of the preceding 19 months. This lack of cyclical slowdown was itself a problem, as port operators would complain of a never-ending “peak season.” The norm had been to have a seasonal crunch followed by a quieter time when ports could recover. They consistently delivered higher quantities throughout.

As a final note on figure 9, which runs only through October 2022 with the latest available data, one can see freight volumes begin to subside in the final months of the graph. This is worth keeping in mind, lest one be tempted by solutions that feature permanently increased capacity.

Thus, the evidence from both goods consumption and import performance indicates that quantities increased significantly and demand expansion effects thus dominated supply contraction. That leaves the question: How do we reconcile these expanded quantities with the delays, high prices, and queued ships described above?

This reflects a supply chain overwhelmed by demand. Supply chains managed to supply over 30 percent more durables in a short time period, but that wasn’t easy. The system had not been built for that capacity. Containers were in short supply. Ocean terminals were overwhelmed with unloaded containers stacked deep; they could not be moved quickly enough to truck or rail connections.

In fact, the elevated consumption numbers underplay the extent of the crunch. Because businesses initially observed a downturn and had been working with lean inventories—as in the autos example—they were not in a steady state. They needed to not only replenish depleted inventories but also adjust inventory levels upward both for increased consumption (maintaining an inventory-sales ratio) and even further if businesses decided to forsake leaner inventory approaches, as discussed above. And all of this had to be done in a short time period. Supply chains were able to significantly ramp up their throughput, but strains showed.

SUPPLY CHAIN RESILIENCE

The question of supply chain resilience is linked to the question of culpability for inflation. If the supply of goods was more elastic, could we not diminish the effects of too much money chasing too few goods? More goods would mean fewer shortages and less upward pressure on prices.

Of course, this is generically true for economies. With sufficiently elastic supply, stoking demand would just lead to increased production and consumption without inflation (or not much of it, anyway). But capacity constraints generally preclude that sort of ability to ramp up production quickly and costlessly.

What do those constraints look like in logistics? The supply chains start with factories, which take time to build, equip, staff, and supply. Trucks, rail cars, and containers are required to move the goods to air and ocean ports. Terminals and cranes are required to load and unload ships, which need crews. At either end, warehouses are typically needed to hold the containers. Once the containers

⁷ We skip over February 2020 to avoid questions about pandemic onset effects.

have arrived in their destination country, they need to move on with truck or rail, each available in limited supply. Then there will be storage and processing at the retail end.

Each of the elements in this chain can be expanded, but not quickly. Take the container ships that carry the vast majority of goods around the world. Why did carriers not order more when the shortage became apparent?

They did. It just takes years to produce a container ship. From January 2021 to January 2024, vessel capacity increased by 4.8 million TEUs—roughly 20 percent. An additional 3 million TEUs of capacity are expected in 2024.⁸

Not only did most of this capacity arrive too late to meet the surging goods demand of 2021 and 2022, but it resulted in a capacity glut in 2023 when prices plummeted back to prepandemic levels. In the face of increased costs, this threatened the profitability and thus the viability of some carriers.

There was a similar story with semiconductors. While they appeared to be in short supply during the pandemic—a shortage that helped prompt a roughly \$50 billion program to expand capacity—real billings were falling by 2023 (see figure 6) and the industry was facing a price slump.⁹

This demonstrates why supply chains cannot carry unlimited excess capacity—it's costly. Companies that have to pay for large amounts of unused equipment and facilities will only be viable if there are occasional enormous returns in periods of stress that offset the losses in more standard times. But those enormous returns to the logistics industry—spiking prices—were exactly what proponents of resilient supply chains hoped to avoid.

Thus, we cannot hope to achieve supply chains that are infinitely elastic in supply. Instead, we could define supply chain resilience as the ability to deliver goods in the face of reasonable shocks without unexpected price increases or delays.

This begs the question of what a reasonable shock might be. As noted above, past precedent might have suggested that it would take an extended period for goods demand to recover from a recession. If we set that consideration aside and look at the experience over roughly the preceding decade, the average quarterly percentage change in real US imports from the second half of 2013 through the end of 2019 was 0.8 percent (not at an annual rate). We then exclude the initial COVID shock and rebound and pick up again in the fourth quarter of 2020. From then through the first half of 2022, the average quarterly percentage change was 2.8 percent. If we pushed back the front end of this period to include the COVID rebound (Q3 of 2020), the average is 4.9 percent.¹⁰ Thus, the increases we witnessed during the early years of the pandemic were *not* what one would consider to be a “reasonable” shock.

A final consideration for this section was the global nature of the COVID shock. The sort of behavioral changes that helped drive the goods consumption binge—the impaired ability to go out and enjoy services in the midst of a health crisis—applied worldwide. This prevented one standard approach to resilience, in

8 See Anders Schulze, “Global Ocean Carriers Halt Red Sea Transits—What to Expect,” Flexport, January 22, 2024.

9 See Tim Bradshaw, “Chip Industry Slowdown Will Last Longer than Expected, Manufacturers Warn,” Financial Times, April 22, 2023.

10 The standard deviation of the prepandemic period was 1.2 percent.

which a slack part of the system can provide resources to a taut part. We do see this sort of adjustment with more localized shocks—as with the current conflict in the Red Sea, which serves to elongate ocean routes to Europe significantly. Carriers have reallocated ships to diminish the impact. That was more difficult in the face of a global shock.¹¹

In sum, global supply chains *were* resilient. They delivered remarkable quantities of goods in the face of an extraordinary demand shock. Although supply chain performance can certainly be improved through efficiency measures, it would not be economically viable to maintain sufficient excess capacity to handle the surges we saw without showing serious strain.

IF NOT SUPPLY CHAINS, THEN WHAT? Maybe the super dumb infinite money printing

The previous section showed how the surge in delivery and consumption of goods pointed to a demand shock rather than a supply chain failure as the predominant impetus behind price increases. This begs the question of where the demand shock came from. The answer is pertinent to questions of supply chain resilience because it gets to the question of what sort of demand fluctuations suppliers should reasonably prepare for.

While an analysis of root causes is beyond the scope of this paper, there are two relevant determinants of goods consumption that may be suggestive and should factor into any such analysis.

First, as shown in figure 10, personal income never dropped back to its March 2020 level in real terms—atypical for a recession. This goes to the budget constraint.

Second, as noted above, there was a shift in consumption preferences away from services and toward goods. One can argue that it was a preferences shift as the quantity of goods consumed relative to services increased even while the relative price of goods was increasing (differential inflation rates). This shift in consumption patterns was a sharp break from previous norms and while the tilt has receded somewhat, it has yet to return to prepandemic norms, particularly for durable goods.¹²

Without taking a stand on whether the documented surge in goods demand was due to fiscal support, to changes in how people shopped, or to monetary stimulus, there is no shortage of explanations for where a demand shock may have originated.¹³

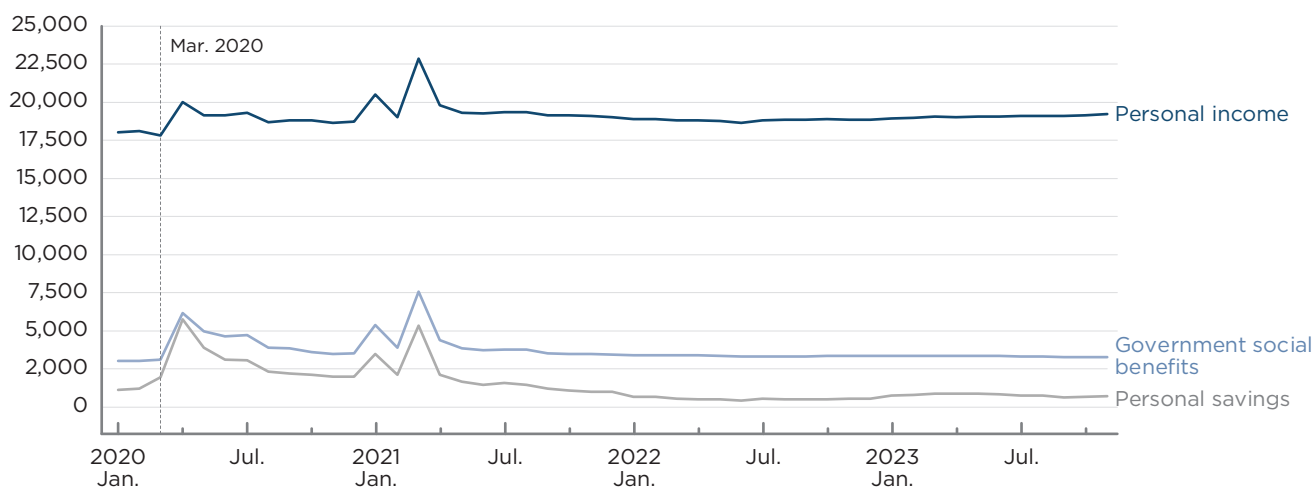
11 This is not to argue that local supply chains are more resilient than global ones. Local supply chains (toilet paper, eggs) were not immune to a pervasive global shock. And a global supply chain allows diversification away from local shocks. See Davide Malacrino, Adil Mohommad, and Andrea F. Presbitero, “Global Trade Needs More Supply Diversity, Not Less,” *IMF Blog*, April 12, 2022.

12 See Flexport, “Post-Covid Indicators,” December 18, 2023.

13 This paper has focused on US conditions, but the shift toward consuming more goods was not confined to the United States. For the United Kingdom, if one looks over the last 10 years of real consumption data, the share of goods in total consumption, from 2013:Q4 to 2020:Q1 ranged from 39.5 percent to 40.7 percent. From 2020:Q2 through 2021:Q2 the figure ranged from an initial high of 45.7 percent to a low 44.1 percent. Of course, this ratio could reflect either increased goods consumption or lower services consumption. Though 2020:Q2 goods consumption in the United Kingdom was the highest quarterly value over a decade; subsequent levels were in a more normal range. It would be useful to characterize other countries’ demand patterns through the pandemic in more detail. See Office for National Statistics, “Consumer Trends: Chained Volume Measure, Seasonally Adjusted,” June 29, 2024.

Figure 10
Real US income and savings, January 2020 to November 2023

billions of 2017 dollars, seasonally adjusted annual rate



Source: Bureau of Economic Analysis via [Federal Reserve Economic Data](#).

CONCLUSION: POLICY IMPLICATIONS

To make an indelible impression, it helps to have a good visual. For the supply chain crisis we had empty shelves and queued ships. There was no corresponding image to convey the massive surge in demand for goods. As the crisis preceded a sharp increase in inflation that originated among goods, it was easy (and popular) to explain that supply chain failures caused inflation.¹⁴

The appropriate assessment of causality has important consequences for policy. For supply chains, there is the danger of erroneous conclusions and prescriptions, such as a pullback from international trade or a need to dramatically expand infrastructure and capacity. For policies intended to stimulate demand, there is the need to find the balance between insufficient and excessive that must be informed by a clear-eyed look at the consequences.

The story that emerges from the data presented in this paper is that global supply chains were heavily stressed by an extraordinary surge in demand. This surge came from consumers facing very low interest rates, enhanced income and savings, and new constraints pushing consumption toward goods, especially durable goods. The consequence was too much money chasing too few goods—and thus, inflation.

¹⁴ There is a burgeoning literature that attempts to assign blame for inflation in much more sophisticated ways than this work. Two notes of caution are warranted. First, it helps tremendously if one uses a good measure of supply chain strain. Importantly, there are problems with the popular but opaque [Global Supply Chain Pressure Index](#) put out by the Federal Reserve Bank of New York that drives some of the empirical work. That index mixes a number of disparate measures of supply and demand in an opaque way. This need not be a problem if the index correlated well with more readily observable measures of supply chain performance, but it does not. This became most apparent when in early 2023 the index showed that supply chain conditions were actually *better* than they had been in the prepandemic year. That conclusion conflicted with direct evidence of transit times (see figure 2) as well as with US, Canadian, and European survey data on shortages and bottlenecks. (See Chris Clague, “[Are We There Yet? Tracking the Recovery in Global Supply Chains](#),” Flexport, June 8, 2023.) Finally, for sophisticated empirical work, there is always the danger of misattribution with imperfectly specified models. This paper has opted for Occam’s razor instead.

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