

The Decline of U.S. Manufacturing Employment since 1980

by

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ABSTRACT

This essay examines the dimensions and causes of the decline of the U.S. manufacturing sector since 1980, with a primary but not exclusive focus on employment. Manufacturing's *share* of nonfarm employment declined fairly steadily from the end of the Second World War (about 32 percent) until 2010, after which it leveled off, although still declining slowly within the 8 percent range. The *level* of manufacturing employment trended upward between 1948 and 1980, subject to strong cyclical fluctuations. Employment stopped growing over the next two decades, followed by a decline of one third in the first decade of the twenty-first century, from which there has been only modest recovery. The paper considers the role of productivity advance in affecting employment, looks at the macroeconomic (twin deficits) explanation of the short-lived employment decline during Reagan's first term, explains why the twin deficit narrative rapidly lost appeal, and compares the China shock vs. global saving glut account of the staggering job losses of the 2000s. The paper includes discussion of some of the cases made for policy intervention to arrest decline.

Introduction

Since the election of Ronald Reagan in 1980, economists, policy makers, and advocacy groups (including lobbyists) have been energized by and preoccupied with the decline of U.S. manufacturing. President Reagan's election took place in the context of a rapidly changing institutional environment governing the United States' economic relationships with the rest of the world. The Bretton Woods system of fixed exchange rates had broken down in the 1970s, replaced with a system of (managed) floating rates. Multilateral agreements negotiated since the end of the Second War lowered tariff and nontariff barriers to international trade. Obstacles to cross border investment had also fallen dramatically. Along with improvements in information and communications technology, this precipitated huge increases in gross investment flows between countries, dwarfing the growing value of expanded trade in goods and services. These changes together provided underpinnings for the second great age of globalization.

A majority of economists probably cheered these developments, interpreting them as furthering the exploitation of Ricardian comparative advantage to the benefit of citizens of the United States and the rest of the world. To this static benefit was added a dynamic fillip: the claim that, by subjecting firms here and abroad to more competition, trade would stimulate faster rates of productivity improvement and quality enhancement, and thus more rapid economic growth.

Others became alarmed by what this meant or might mean for U.S. manufacturing. Those concerned often started (and start) with a presumption that a decline of manufacturing was (and is) inherently bad from a national standpoint, and advanced numerous arguments as to why this was so and why something needed to be done about it. The most compelling argument was and is that increased reliance on foreign sourcing for military hardware or its components, and a concomitant reduction of U.S. manufacturing capability, could have serious implications for national security, particularly if broadly defined (c.f. the pandemic).

Proponents of action to reverse decline also argued that allowing shrinkage to proceed threatened long term economic growth because it allowed a key component of the U.S. innovation infrastructure to atrophy, preventing synergies that resulted from close coordination and communication between those responsible for design and manufacture (Pisano and Shih, 2012). A robust domestic manufacturing sector and the know-how and experience it sustained, they maintained, is essential for a healthy rate of innovation, often noting that the preponderance of private sector R and D takes place in manufacturing, and the sector is the locus of more than half the patents granted in the United States. Those making this argument dispute the view that the U.S. can afford to concentrate on research and design, while outsourcing actual manufacture to cheaper foreign platforms. Others, however, reference Apple Computer's success with the iPhone, or companies such as Nvidia or Qualcomm, who design semiconductor chips but contract out their production to foreign companies, particularly Taiwan's TSMC. These successes seem to show that design and marketing can indeed be profitably separated from fabrication (Mann, 1991; Miller, 2022, ch. 36). During the 1980s and up until after the financial crisis (but not thereafter), as offshoring proceeded at an accelerating rate, productivity growth in U.S. manufacturing remained robust, often exceeding advance elsewhere in the world.

Pisano and Shih (2012, ch. 4) acknowledged that some manufacturing could be safely outsourced. But it should not be done thoughtlessly, they maintained, developing a typology for when it was dangerous to do so and when it was not. Ill-advised management decisions could lead to a downward cycle in which 'industrial commons,' whose value transcended individual companies participating in them, could

permanently decay. Since 2010, productivity advance in U.S. manufacturing has been dismal, perhaps supporting the claims about the (delayed?) consequences of the loss of industrial commons.

Those concerned not just with how fast the economy was growing, but also with how the resulting income was distributed among households or factors of production, argued that, in part because manufacturing was heavily unionized, its shrinkage eliminated good paying jobs. These were often held by those with lower educational attainment, thus contributing to a statistically indisputable worsening of labor's share as well as overall income and wealth inequality in the United States (McKinsey Global Institute, 2017, p. 6). The decline of manufacturing was linked to the decay of entire communities as plants shut down, producing what many described as the rust belt phenomenon, as people moved away only reluctantly, because of longstanding community ties and lock in through home ownership, even as housing values in the impacted communities declined. A number of authors forcefully linked the loss of manufacturing jobs to the growing appeal of right-wing political candidates in swing states and in the country more generally (Komlos, 2023, ch. 15).

An additional pro-intervention claim has been that a loss of a manufacturing job results in a greater negative employment multiplier than job losses in other sectors of the economy (Bivens, 2019). While the calculation of employment multipliers can be useful over the short term, their limitations must be acknowledged. The estimates, for example, consider job loss in supplier industries, but not among the suppliers' suppliers. They estimate job loss in local retail and service sectors affected by reduced incomes and spending of primary job losers, but not among firms that may be supplying the retail industries. Nor do these calculations factor in the degree to which suppliers of local suppliers are located outside of the country; higher import shares lower the U.S. employment multipliers. Even were one to attempt to incorporate a full input-output matrix for the economy, conclusions as to the persistence of these effects over time are sensitive to how realistic is the assumption of fixed factor coefficients over the longer run. And finally, since job loss in some sectors is almost unavoidably a concomitant of productivity and living standard improvements over the longer run, some uneasiness with too absolutist an emphasis on 'saving' jobs is understandable.

To say the least, how the pros and cons of government intervention stack up is a contested question.

Historical Background

There are three main metrics used to chart the size and/or importance of the U.S. manufacturing sector: employment, manufacturing's share of the labor force, and the portion of national income for which the sector is responsible. By any of these metrics, manufacturing grew in importance during the nineteenth century, particularly after the Civil War. The growth continued during the first half of the twentieth century, with the second and third of these metrics peaking during the Second World War, boosted by economic mobilization for that conflict. Manufacturing grew in relative importance during the 1920s and particularly across the depression years, and productivity advance during the interwar period, especially between 1929 and 1941, meant that at the time of Pearl Harbor, the United States enjoyed a substantial advantage over competitors in the rest of the world (Field, 2003, 2011, 2018).

The sector was further enlarged during the war – some might say bloated -- because of the sharp increase in military spending and the goods-intensive nature of military production. It was further swollen, especially the employment numbers, by the sharp wartime decline in manufacturing productivity. This claim may come as a surprise to those brought up on a narrative heavy with

references to ‘miracles’ of both production and productivity. The legacy of wartime corporate advertising, which stressed extraordinary advance on both metrics, was reinforced after the war by narratives in both history and economics reflecting and reinforcing a vision of U.S. factories operating 24/7, 365 days a year. In reality, ordnance was produced within a shortage economy that suffered throughout the conflict from production intermittency due to the temporary inability to obtain complementary inputs (Field, 2008, 2022, 2023).

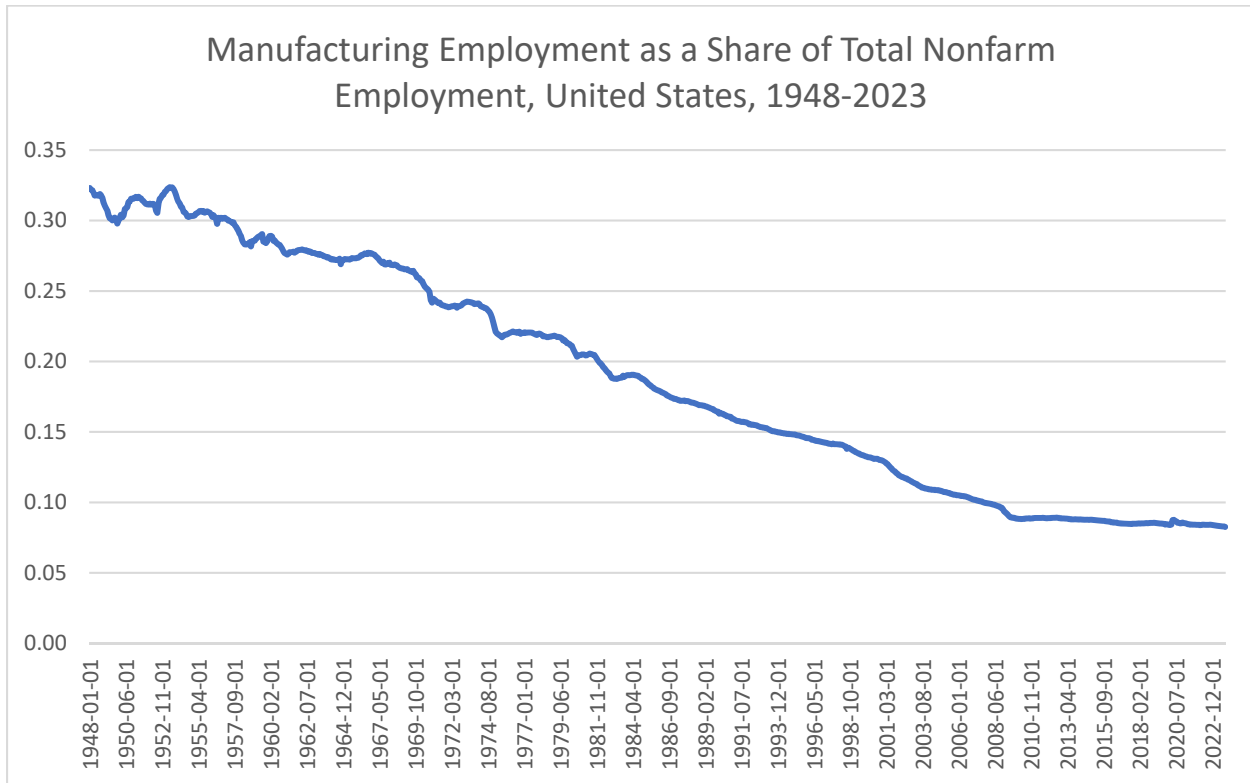
Iconic photographs of B-24 assembly in Ford’s massive Willow Run plant – the largest in the world when first completed – have probably done more than anything else to solidify the conventional view. Aircraft manufacture at Willow Run did not proceed with anything like the efficiency evidenced by Ford’s smoothly functioning public relations operation. Indeed, the company’s performance in managing the plant was so dismal that as late as March 1943 the Truman Committee threatened to bring in another firm to manage the facility. Eventually contractors, including Ford, did get better at making military durables, leading to widely referenced learning curves showing unit costs declining as a function of cumulative production. But these improvements could not compensate for the sharp negative effects on productivity of the sudden and radical changes in the U.S. product mix. And product cycles were often short. Gains achieved could and did evaporate with contract cancellation as the war progressed and the military demanded more advanced equipment, culminating in massive cancellations at the end of the war.

It may not have been done efficiently, but the United States did succeed in producing an enormous amount of military goods for its troops and those of its allies, and manufacturing’s share of the U.S. labor force or of output would never be higher. That said, production of war goods dropped rapidly following V-E and V-J days. Employment peaked at 16.6 million in November 1943, the height of wartime military production, trending downward thereafter, initially modestly. After the war, the rate of shrinkage accelerated and employment fell, at first precipitously, to 11.9 million in February 1946 in the face of conversion and the postwar strike wave. Between 1945 and 1948 the economy returned more or less to a prewar product mix, with some recovery in efficiency that left labor productivity in manufacturing in 1948 roughly where it had been in 1941 and total factor productivity still substantially below its prewar level. Employment also recovered with expanding production, exceeding 14 million from September 1946 through November 1948.

At the onset of Henry Luce’s ‘American Century’ (Walker, 2018), the United States stood astride the world economy like a colossus. But attributing that to what was learned making military durables during the war is a mistake. The war was a detour. Most of the supply side foundations for the postwar productivity advantage were in place in 1941 and had little to do with wartime manufacture. The 1941/1948 U.S. advantage was enlarged not by increases in U.S. levels, but by the massive wartime devastation, including that of their industrial base, experienced by U.S. competitors.

U.S. manufacturing appeared strong in the United States throughout the 1950s and 1960s, even though its share of nonfarm employment declined more or less steadily after World War II, from 32.3 percent in 1948 to around 8.3 percent in 2023. Much of this decline reflected continuing productivity advance and the predictable effects of limited price or income elasticity in a world in which the relative price of manufactures generally fell and Americans got wealthier over time. The rate of decline of this share slowed dramatically after the financial panic, coinciding with the disappearance of productivity gains in the sector. Labor productivity in manufacturing, which had grown at 3.7 percent per year continuously

compounded between 1994 and 2011, declined at about half a percent a year through 2022 (U.S. Bureau of Labor Statistics (2023)).



Source: FRED database, series MANEMP and PAYEMS.

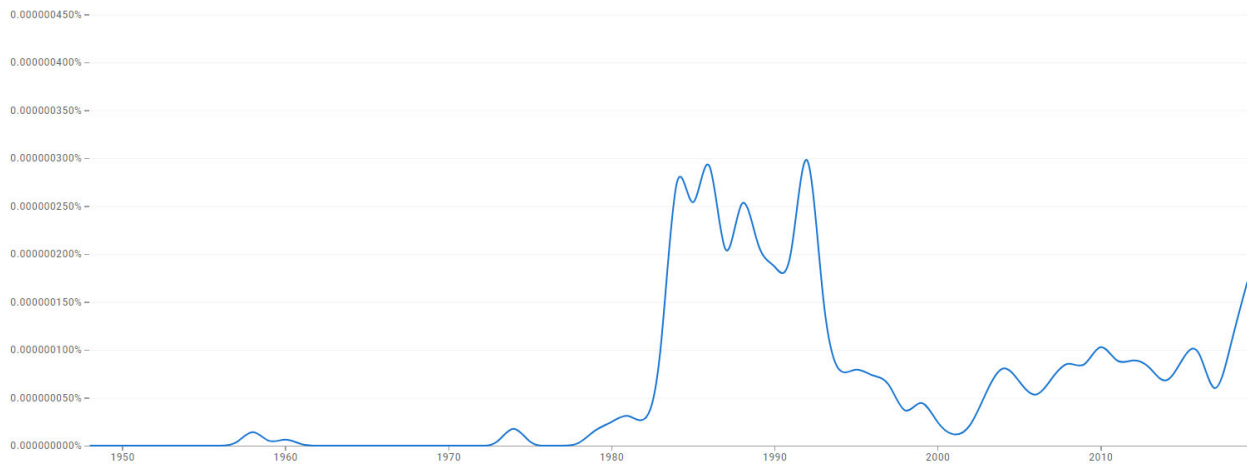
Unlike the share of employment, the share of manufacturing value added in real GDP has remained relatively stable since the end of the war, although the choice of base year and deflation method matters, and the nominal share has trended gradually downward, reflecting the declining relative price of manufactures in comparison, for example, with services.

Part of the reason American manufacturing continued to appear robust during the golden age (1948-73) was that the economy emerged from the war with household balance sheets flush with savings accumulated when employment was high, government bond drives had discouraged consumption, and many goods, particularly consumer durables like cars and appliances, were unavailable or strictly rationed. As the baby boom began to accelerate and rates of household formation rose, construction, particularly of new houses, finally surpassed records first established in the 1920s. Domestic orders for manufactured goods to fill the new houses and their driveways and satisfy deferred replacement demand remained strong, as did U.S. exports, as the Marshall Plan rebuilt Europe.

During the 1970s, the sector experienced twin oil shocks, but by the end of the decade (June 1979), manufacturing employment reached an all-time high. Serious concerns about the decline of the sector had yet to manifest themselves. According to Google's Ngram Viewer, which plots the frequency of text strings in a body of printed works, references to the decline of U.S. manufacturing experienced modest boomlets between 1949 and 1952, between 1957 and 1960 and between 1972 and 1975. Frequencies

began to take off in 1978 and then exploded in the period 1981- 1992. References continued, but at a more moderate rate, between the early 1990s and 2008, when they again jumped. The decline in the absolute number of U.S. manufacturing jobs in the decade of the 2000s was striking, much of it taking place even before the cyclical effects of the financial crisis and ensuing recession become apparent. That decadal drop reinvigorated a literature that was birthed in the 1980s but then simmered during the better part of two decades before heating up again.

Figure 2
 Google Ngram Viewer: “Decline of U.S. Manufacturing”
 1948-2019



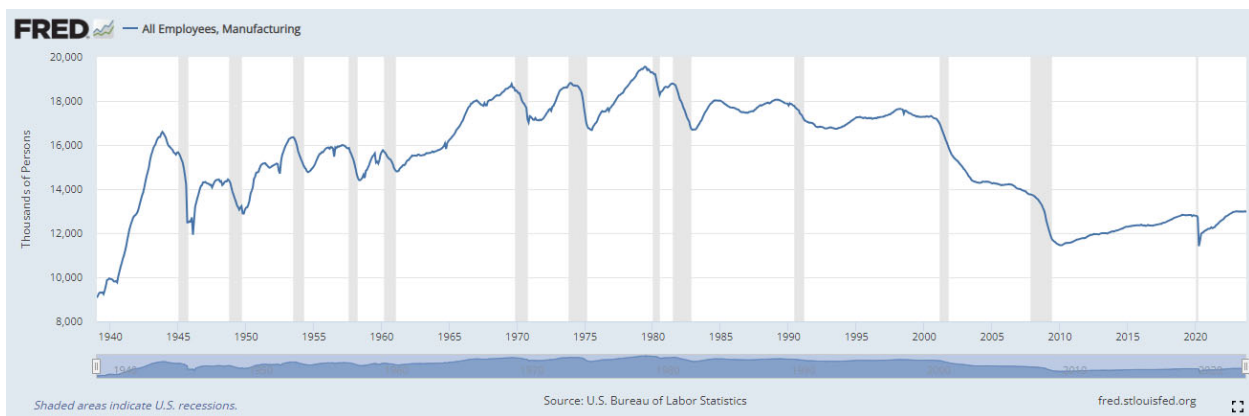
Note: The plot displays, by year, the frequency of ngrams (in this case a 4gram) in a corpus of printed works, in other words, what fraction of 4grams match the identified text string. In this case the corpus is American English and the option of searching independently of case (case-Insensitive) has been selected. The annual data are not smoothed (smoothing parameter = 0).

Overall employment in manufacturing (not its share), grew from 9.1 million at the start of 1939 to 16.6 million at the peak of war production in November 1943. It declined gradually through February 1945 (15.9 million) and then precipitously as the end of the war approached and rapid demobilization ensued, reaching a nadir of 11.9 million in February 1946, during one of the most active periods of labor unrest and strike activity in U.S. history. As the economy recovered and returned to producing the prewar product mix (automobile production resumed in October 1945), employment rose above 14 million from September 1946 through December 1948, before declining to 12.9 million during the recession preceding the Korean War. With the outbreak of the Korean war (June 1950), employment again broke 14 million and then continued to increase, particularly in the first half of 1953, reaching 16.4 million in July 1953, close to the World War II record. Employment receded in the post-Korean War recession, and then toyed with exceeding 16 million between 1955 and August 1957. Employment fell to 14.4 million in May 1958, recovering to 15.8 million in February 1960, then down again to 14.8 million in the recession that coincided with the start of the Kennedy administration.

With the Vietnam buildup and the booming economy of the 1960s, total employment surpassed its World War II peak in July 1965, and reached 18.8 million in August 1969 before recession pulled the jobs number down to 17 million in November 1970.

During the 1970s, manufacturing employment, although volatile, continued to increase, rising to 18.8 million in December 1973, just prior to the first oil shock, before declining to 16.7 million in the ensuing recession. Manufacturing then began a sharp recovery, with employment hitting its all-time high of 19.6 million in June 1979. The slowdown of manufacturing productivity growth after 1973 due in particular to the need to adjust to the oil shocks, along with relatively low unemployment at the end of the decade, probably played some role in this.

Figure 3
U.S. Manufacturing Employment, Monthly, 1939-2023



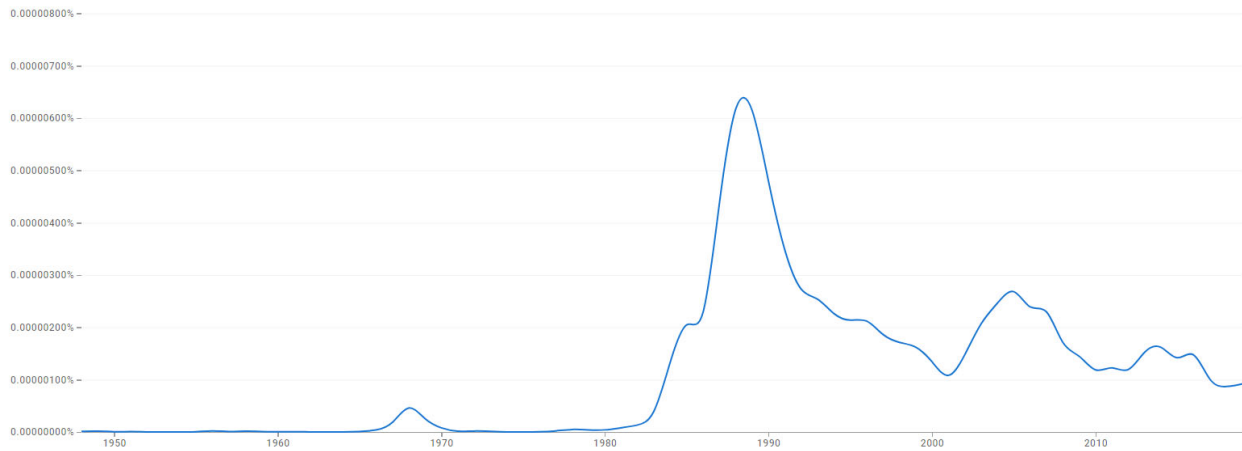
Source: FRED Database, Series MANEMP, Monthly, Seasonally Adjusted.

Employment then declined in the recession of 1980 and more steeply during the severe downturn of 1982, returning in the trough to the 16.7 million level experienced in the 1975 recession. Recovery brought it back above 18 million again in April 1984. It sagged in the mid-1980s, losing about 600,000 workers, before rising above 18 million at the end of Reagan's presidency in December 1988.

As reflected in the n-gram data (Figure 2), widespread concern with manufacturing's decline began under President Reagan. Much of the discussion at the time was organized around the idea of the twin deficits (federal budget and current account) and their connection. Up through the 1990s, an n-gram viewer plot of references to 'twin deficits' shows much the same pattern as 'decline of U.S. manufacturing.' There are small boomlets in 1960-61 and between 1966 and 1970, with an explosion starting in 1982 and then declining frequency in the 1990s. There's a pickup again between 2000 and 2004, but notably, the spike after 2008 evident in the 'decline in manufacturing' n-gram is absent.

It is striking, indeed, looking over Reagan's two terms and the entire 1980s, how little actual decline actually occurred in manufacturing employment. By the end of the decade, the dollar appreciation of the first part of the decade had been completely unwound, the budget deficit had narrowed, and the current account deficit enjoyed a half year in surplus. These developments help explain why discussion of manufacturing's decline receded until resuscitated by what happened in the 2000s. No doubt Reagan did much to strengthen the foundations for future shrinkage in manufacturing employment. But by and large, it was not under Reagan that truly large declines took place. It was under George W. Bush.

Figure 4
Google N-Gram: “Twin Deficits”



Note: American English and Case-Insensitive selected and smoothing parameter = 0.

Employment sagged somewhat during the 1990 recession, then rose above 17 million in April 1994, and continued above that level through the remainder of the decade, with a peak in March 1998 at 17.6 million.

Between January 2001 and February 2010, sectoral employment dropped by a full third, from 17.2 to 11.5 million. More than half of that took place prior to the cyclical effects of the financial crisis and Great Recession. Subsequently, although interrupted by the pandemic shock, there has been some modest growth (coinciding with an evaporation of sectoral productivity improvement), with the numbers in September 2023 at 13 million.

An obvious conclusion from these data is that there are strong and predictable cyclical effects on manufacturing employment. This is not altogether surprising since these numbers are an important series considered by the NBER business cycle dating committee in deciding when recessions begin and end. But it is clear, looking back over the past four decades, that there has also been a secular decline. Much of the attempt to understand what has been driving this has focused on the United States' relationships with its trading partners – particularly on the relaxation of trading restrictions, with a special emphasis on China.

But there have been and remain those who doubt that trade is a primary factor in the decline. They have argued that it is natural to expect that, as an economy matures, its manufacturing sector will eventually shrink, both relative to other sectors in the economy and in absolute terms. First, if productivity growth in manufacturing is rapid, employment will simply not grow as fast as output, and will tend to decline unless demand has a highly elastic response to a declining relative price. That was true for computers and IT equipment during the 1990s but not for many other subsectors, and so, it is argued, it is to be expected that there will be a tendency towards shrinking sectoral employment. A low income elasticity of demand in an economy in which average income levels are rising could potentiate this effect.

That said, and this has been a point emphasized by those focused on trade, for a given quantity of manufactured goods domestically demanded, domestic output and employment will be lower the

greater the portion of that demand satisfied by foreign-produced goods. Thus, since the current account is dominated by trade in goods, and since manufacturing goods account for a large proportion of the goods portion of the trade deficit, it seems plausible that growing current account deficits could have something to do with the decline of the U.S. sector.

Let's consider the analytical structure of the twin deficits narrative that emerged to explain what was happening in Reagan's first term, and that drove the initial upsurge in the 'decline of U.S. manufacturing' alarms. With the election of Reagan, the sector experienced macroeconomic shocks unusual in several respects. As already explained, these occurred within an institutional policy environment that had switched from fixed exchange rates to managed floating, reduced the tariff and non-tariff barriers to international trade, and greatly liberalized the opportunities for cross border investment. The twin deficits narrative, it must be emphasized, presumes all of this.

In his 1980 presidential campaign, Reagan promised to cut taxes dramatically, increase military spending by building a 600 ship Navy and funding a Star Wars missile shield, and balance the federal budget. He achieved the first two, but not the third of these goals. The predictable consequence of increased spending and dramatic tax cuts was an explosion of the deficit, Art Laffer and a parabolic curve sketched on a napkin notwithstanding. When this fiscal expansion collided with Paul Volcker's successful efforts to shrink the money supply and rein in inflation, we had a rightward movement of the IS schedule colliding with a leftward movement of the LM schedule. The consequence was a sharp rise in the real interest rate to levels not seen since the 1920s, even though nominal rates declined as the inflation premium got wrung out of bond markets with the actual decline in the rate of price increase.

Traditional macroeconomic analysis predicts that this would take a toll on manufacturing, by reducing private sector capital accumulation and consumer demand for durables, but the fact that exchange rates were now flexible changed the likely locus of the crowding out effect. According to the twin deficits narrative, high real returns in U.S. assets increased the attractiveness of such assets compared to other countries' assets with similar risk profiles, leading to a growing surplus on financial/capital account as foreign wealth holders responded by acquiring U.S. assets. The demand for U.S. currency to complete these transactions led to an unprecedented appreciation of the dollar, which soared 55 percent between September 1980 and February 1985 (FRED, series DTWEXM). In terms of the magnitude and rapidity of the appreciation and the level ultimately attained, there is nothing comparable in the half century since the Bretton Woods system collapsed.

As a simple matter of accounting, a widening deficit on current account had to match the widening surplus on capital account. Only by financing an increased current account deficit could the rest of the world transfer real resources to the United States. Since the current account is dominated by trade in goods, expansionary fiscal policy colliding with tight money posed serious challenges for U.S. manufacturing. A high value of the dollar would make it difficult to sell into foreign markets as foreign consumers switched to their domestic providers. And some of our trading partners would now find they could sell into U.S. markets, undercutting the dollar price of U.S. manufacturers and threatening their dominance in U.S. domestic markets. As many other countries have experienced, a strong currency can be a curse as well as a blessing, affecting different sectors of the economy differently depending upon where they are situated.

Figure 5
Trade Weighted U.S. Dollar Index: Major Currencies (Goods Only), 1973-2019



Note: This chart shows, over time, an index of how many units of a trade weighted bundle of foreign currencies one U.S. dollar would purchase.

Source: FRED database, series DTWEXM.

The logic of the twin deficits analysis seems bulletproof. The 1980s were indeed characterized by twin deficits: a deficit in the federal budget and a deficit on the current account, linked through the mechanisms just described. The narrative, however, quickly ran into trouble. Although the current account deficit persisted, and indeed eventually grew much worse after briefly vanishing at the start of the 1990s, the federal budget deficit began to shrink in 1992 and disappeared during President Clinton's second term: modest tax rate increases and robust economic growth pushed the budget into surplus for four years at the end of the 1990s (1998-2001). And, as noted, after all the 1980s discussion of decline, manufacturing employment ended up roughly unchanged at the end of the decade relative to what it had been when Reagan was elected.

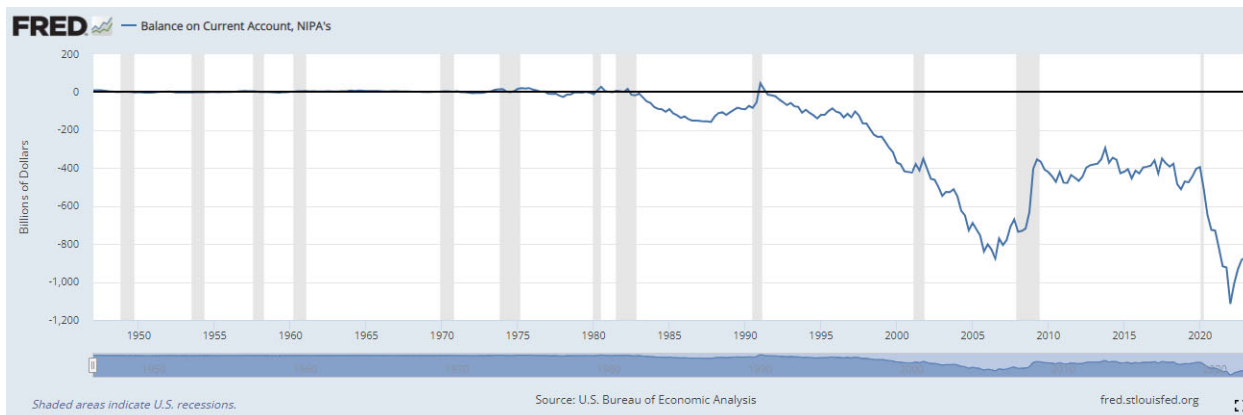
Here's why the twin deficits narrative fell from grace almost as rapidly as it had acquired adherents. First, though the fiscal deficits continued, the period of very high dollar exchange was relatively brief. It was ended by a policy initiative and agreement (the Plaza Accord) hammered out multilaterally at a G-7 meeting in 1985. Although Bretton Woods had broken down, exchange rates were determined within a regime of managed floating. Central banks could and did continue to intervene by increasing or decreasing their holdings of foreign currency or asset reserves (usually Treasury securities). If a foreign central bank reduced its holdings of U.S. assets (dollar reserves), the effects would be to dull or counteract what otherwise might have been a larger or more prolonged rise in the U.S. exchange rate (Frankel, 2015). Concerned about the effect of higher real interest rates on the exchange rate and therefore on export-oriented or import-competing sectors, U.S. negotiators pressed for an agreement that would bring down the exchange rate, and, as a result of the ensuing agreement, the dollar depreciated sharply between 1985 and 1987, more than compensating for the initial appreciation. The J-curve literature suggested it would take some time for depreciation to affect the trade balance, and it did – about two years -- but the absolute value of the current account deficit began to drop in 1988Q1. By the end of 1990 it had shrunk to just \$54 billion on an annualized basis, from \$157 billion at its trough

in 1987Q4. In 1987 G-7 central bankers decided that the goals of the Plaza Accord had been achieved and, in the Louvre Accord, agreed to take joint action to prevent further depreciation of the dollar.

The current account deficit continued to shrink, almost disappearing in 1990 (and doing so in 1991Q1 and Q2). This was due to the delayed effects of the reversal of the dollar appreciation augmented by the negative effects on imports of the modest 1990 recession. But subsequently, the current account deficit again began to grow, and did so more or less steadily until 2001Q1, before taking a pause during the 2001 recession. The twin deficits narrative now lacked explanatory power, since the budget deficits, the prime mover in that story, shrank and then disappeared in Clinton's second term. The exchange rate did rise about 41 percent between 1995 and February 2002, and then began to decline, but this rise could not be attributed to federal budget deficits, which were absent during most of this interval and only began to increase as the exchange rate began declining. Analysts also began to recall that large budget deficits in the 1970s had had little effect on the current account, leading to the suggestion that the twin deficits of the 1980s might actually be considered an aberration. The national income and product identities mandate that the current account deficit (capital/financial account surplus) reflect foreign saving directed to the U.S., and that this must cover any gap between gross private domestic investment and national saving (the sum of government and private sector saving). While the government budget had swung into surplus (positive government saving), the household saving rate had declined; foreign saving still had to cover the difference as the current account widened.

A new narrative was needed. The story for the 1980s was premised on foreign wealth holders moving along a stable demand curve for U.S. assets in response to changes in relative risk adjusted rates of return resulting from innovations in U.S. macroeconomic policy. A new narrative for the 1990s focused on how attractive the booming U.S. stock market was for foreign investors. And it referenced sluggish rates of economic growth in our trading partners, which meant slow growth in U.S. exports (their imports), while the soaring U.S. economy did the reverse, increased demands for imports (their exports). Finally, it pointed out that the government move from dissaving to saving (federal budget moving from deficit to surplus) was largely counteracted by a decline of U.S. private saving. The effect of this on the current account was potentiated because the import intensity of consumer spending (growing with falling household saving rates) was much higher than that of government spending (declining) (Mann, 1999).

Figure 5
U.S. Balance on Current Account, 1947-2023



But there was a new wrinkle as well, which would become even more important in the explanations of what happened in the 2000s. The new narrative emphasized *shifts* in foreign wealth holders' and central bankers' demand schedules for U.S. assets resulting more directly from developments in the foreign countries themselves. Increases in the exchange rate would reflect an increase in the demand for U.S. assets (not simply an increase in the *quantity* demanded responding to changes in the arguments of a stable demand function). The focus was on a growing hunger outside of the United States for assets that embodied safety and stability, rather than simply relatively attractive yields (Bernanke, 2005). Precipitating factors identified included the takeover of Hong Kong by Communist China in 1997, the 1998 Russian default, and the response of foreign central bankers to the Asian financial crisis.

That crisis was the indirect consequence of the liberalization of capital/financial accounts, which allowed huge flows of financial investment into developing countries, and equally rapid exits, resulting in a whipsawing of exchange rates. As foreign capital flowed in, local currency appreciation permitted large current account deficits in the affected countries. When Western investors headed for the exits, disenchanted with prospects the loans would be repaid, depreciation and austerity followed, as the developing economies now tried to engineer the outflows of real resources necessary to pay back their creditors. To moderate the appreciation and then collapse of their currencies in the future, Asian central banks aimed to accumulate large stocks of U.S. dollar assets that could be used to reduce exchange rate movements if faced with similar hot money flows again (Mann, 2000, p. 43).

To the degree the shift in the demand for U.S. assets increased U.S. bond prices, it lowered U.S. interest rates, and stimulated the U.S. domestic economy, further worsening the trade balance by increasing U.S. imports.

Looking back over the last 45 years, a key takeaway is that among many, although not all economists, there is an increasing emphasis on movements in the capital/financial account driving changes in the current account, rather than the traditional emphasis on the reverse, particularly under Bretton Woods and the earlier gold exchange and gold standards. The new approach is reflected in this statement from the 1998 *Economic Report of the President*: "Changes in the trade balance are seldom related to specific market-opening efforts; this is generally determined by macroeconomic factors, not microeconomic barriers to trade" (1998, p. 246).

The observation is relevant in trying to choose between competing explanations of what happened in the 2000s.

The 2000s

During the 2000s, manufacturing employment shrank by a staggering amount: a full third. There are two competing narratives, one which comes at the problem from the current account side, and the other from the capital/financial account side. The current account explanation focuses on a change in the trade status granted by the United States to China. Prior to 2001, China had NTR (normal trade relations) status, which was offered to all World Trade Organization members. But China did not officially accede to the WTO until December 11, 2001, and before that, the status had to be renewed annually by the United States, introducing uncertainty about the terms on which the country would be permitted to have continued access to the U.S. market. Prior to 2001, various political groups often succeeded in delaying renewal. In October 2000, anticipating China's entry, the US granted China PNTR (Permanent Normal Trade Relations) status, effective at the start of 2001, which removed this uncertainty (prior to 1998, PNTR was called MFN --most favored nation status). From the standpoint of the Chinese, this can be thought of as "a specific market-opening endeavor." Pierce and Schott (2016) view this policy change – from the U.S. perspective sometimes referred to as the 'China shock' -- as the fundamental cause of the very large drop in manufacturing employment during that decade up to 2007. Employment fell 2.8 million from a January 2001 level of 17.1 million to 14.3 million in September 2003, an additional 600,000 to February 2008, and then another 2.3 million between then and February 2010, for a total loss between the beginning of 2001 and the beginning of 2010 of 5.7 million jobs, or about a third.

The competing narrative builds on the story devised to explain worsening current account deficits in the face of budget surpluses during Clinton's second term, an account emphasizing foreign central bank and private investor responses to transfer of Hong Kong to China, the Russian bond default, and the Asian financial crisis. The narrative was now expanded and made more general, with appeal to a global saving glut seeking havens in safe assets which meant, in particular, U.S. Treasury securities. The attractiveness of such assets was based not only on their long record of freedom from default but also on the maturity and depth of the secondary market – which, due to the large number of such securities outstanding, provided unparalleled liquidity. Again, the only way the rest of the world could actually transfer real resources to the United States in exchange for such assets was to force a widening of the current account deficit. And, for reasons already described, it was likely that this widening would come to a considerable degree at the expense of US domestic manufacturing and employment.

Other factors, of course, also probably contributed. Productivity advance in manufacturing between 1995 and 2007 was relatively rapid, reflecting the ultimate resolution of the Solow paradox, as IT investment finally did begin to show up in the productivity statistics. Obviously, the more rapid was sectoral productivity advance, the fewer employees would be needed to produce a given amount of output.

It is also worth observing that, in contrast to the second half of the 1990s, the exchange rate declined between early 2002 and March 2008, as the storm clouds announcing the arrival of the Global Financial Crisis began to roll in. Despite this depreciation, it is likely that, absent the continuing strong rest of the world demand for U.S. assets, the exchange rate would have fallen more, thus hindering the ability of the U.S. to sustain such a large current account deficit.

As economists contemplated the manufacturing sector after the employment shrinkage of the 2000s, it became more difficult to dismiss job losses of these magnitudes as necessarily reflecting only domestic

U.S. developments. Clearly foreign economic relations played some role: the question was whether this had to do with falling barriers to entry for foreign companies trying to export to the U.S., or an apparently insatiable hunger for U.S. 'safe' assets.

In their 1994 *Scientific American* article, Krugman and Lawrence calculated the difference between the actual share of manufacturing value added in the U.S. and a hypothetical share had trade remained roughly balanced (no deficit or surplus) and found the differences in the trajectories to be small. Their data, however, ended in 1990, a year that would have encouraged them in their thinking, since the current account deficit was then small and close to the point of (temporarily) vanishing. In contrast, the balance in 2006Q3 was -\$875.8 billion (and even larger in absolute terms in 2022Q2). Dismissing international influences is more difficult with the additional years of data now available to us.

Reflections and Conclusion

Not everyone agrees that U.S. manufacturing is declining, or that, if it is, that decline of U.S. manufacturing employment should be arrested, or that if that is to be done, that government actions are the appropriate means to do so. If one believes that some kind of government intervention is warranted, the routes forward are less obvious than they may appear.

The twin deficits narrative emphasized a link not only between the budget deficit and the current account deficit, but also between the current account deficit and manufacturing employment. The logic, like a set of nested Russian dolls, was that the trade deficit dominated the current account, that trade in goods dominated the trade deficit, and that manufactures dominated trade in goods: "In 2011, about 86 percent of U.S. goods exports and 78 percent of all goods imports were manufactured productsTherefore, when imports are higher than exports and the share of imports is expanding, i.e., when the goods trade deficit is growing, domestic manufactured products and manufacturing jobs are displaced" (Scott, Jorgensen, and Hall, 2013, p. 4). It would seem to follow then, that a parsimonious route to stanching manufacturing output/job loss would be through actions that reduced the current account deficit.

But it does not follow that manufacturing shrinkage would necessarily be alleviated by policies focused simply on reducing the current account/trade/goods deficit. No one argues for fiscal and monetary austerity for that reason, and it would be a silly policy to pursue if the goal were to boost manufacturing, since it would decimate demand and production for the domestic market. The twin deficits narrative fostered an apparently more reasonable argument that eliminating the full employment budget deficit (in other words, eliminating government dissaving) would do the trick. The evidence of recent decades, however, raises doubts that actions to bring the federal budget deficit into balance by raising taxes or cutting spending or entitlements will necessarily have much effect on the current account deficit.

Further complications arise if we approach the problem from a vantage point assuming that the financial/capital account is now the main driver of changes in the current account rather than vice versa. The United States continues to produce items very much in demand by the rest of the world. Unfortunately for many U.S. manufacturers, the preponderance of these items appear to be assets (predominantly financial assets), not tradeable goods. Placing restrictions on the ability of foreign wealth holders or central banks to buy or accumulate U.S. treasuries (Scott, Jorgensen, and Hall, 2013) would lower their price, increase their yields, and further raise the burden faced by taxpayers in servicing the existing federal debt. Trump's efforts to stimulate the manufacturing sector via protection

were notably unsuccessful, since he seems to have ignored the possibility of retaliation and had to spend \$16 billion dollars annually to “compensate” American farmers (on top of regular subsidies) for their resulting loss of markets. For manufactured imports, the main effect of the tariffs was to increase the cost of appliances and other durables for U.S. consumers. The current account balance under Trump remained relatively unchanged prior to the pandemic.

As these observations indicate, interventions the consequences of which seem simple or obvious are often not so, and on close examination seem less desirable when considered carefully. Widespread skepticism about the effectiveness (and sometimes desirability) of intervention has led to what a 2017 McKinsey Institute report described as a “prevailing narrative (saying) that nothing can be done to stop (manufacturing’s) decline at the hands of globalization and technology” (2017, p. 11).

Anticipating this skepticism, and perhaps worried about their inability to overcome it, Pisano and Shih ended their 2012 book by falling back on a claim that we should subsidize manufacturing because so many other sectors of the economy (examples: real estate, private equity, through the carried interest loophole, agriculture) already receive substantial government support in the form of direct subsidy or tax expenditures. Their closing argument for government action therefore devolves into a simple call to “level the playing field” domestically (2012, p. 133). This is unlikely to persuade those who might prefer the elimination of unjustified subsidies to other sectors.

The strongest arguments for government support of manufacturing remain those invoking national security, particularly if we define national security in a broad fashion. Reliance on cheap foreign sourcing and just-in-time inventory management is efficient until it is not, that is, until what is considered a dependable source of supply turns out not to be. This became clear, for example, during the pandemic, when access to PPE and materials and equipment necessary to produce vaccines were no longer easily available. We are thus driven to the view that if anything is to be done, it must probably be in the form of targeted industrial support combined and aligned with continued government funded research and development, rather than broader initiatives motivated by the national income and product accounting identities, however compelling they seem to be. In his deeply researched history of the semiconductor industry, Christopher Miller argues that these interventions were more likely to succeed not when they tried to “resuscitate failing firms but when they capitalized on preexisting American strengths” (2022, p. 148). This has in recent years meant more focus on initiatives to boost export competitiveness as opposed to import substitution (Juhasz, Lane, and Rodrik. 2023), although that may now be changing.

Any case for government intervention benefiting a particular sector, industry, or firm, will remain vulnerable to the objection that whatever justifications are proffered, they simply disguise a special interest claim. Appeals to national security are as likely as any other to experience this fate, with advocates presumed to be ‘wrapping themselves in the flag’ to obtain benefits from the tax-paying public. But the world is in fact divided into nation-states, and the concept of national security is meaningful. The interests of an individual firm may or may not coincide with those of a nation (Vernon, 1971). Actions by a government in the name of national security will differentially impact firms, benefitting some, harming others by not supporting them or, for example, subjecting them to export controls.

National security arguments can be abused, like any other claim by private actors for government support. But that does not mean that any proposal for support can be rejected out of hand. Some government interventions such as DARPA may ultimately be viewed as successes, others, such as

SEMATECH, less so. But the fact that some initiatives fail to deliver what they promise does not tarnish the entire category any more than does the failure and ‘waste’ associated with business initiatives that don’t pan out.

Arguments for targeted intervention, if they are to persuade, must be dynamic, because they must overcome the presumption that intervention will initially impose static losses. This has been true since the initial development of U.S. manufacturing, when the infant industry argument was used to justify high rates of protection that, at least in the short run, increased costs to U.S. consumers. Skepticism about the alleged dynamic benefits that would follow from various forms of industrial policy helps explain the chilly reception those policies have often experienced from U.S. economists. But the political and intellectual climate for such policies has warmed in recent years. The initiatives to bring back the U.S. solar panel industry (*New York Times*, November 7, 2023), or to stimulate domestic chip production, or more generally to support small and medium sized manufacturing firms are cases in point. These policies include producer subsidies, buyer subsidies (provided the item satisfies domestic content thresholds) as well in some cases as tariff and/or quota protection, as well as publicly funded research and development.

Obviously, if considered a high enough priority, it would be possible to increase employment in any firm or industry or indeed the manufacturing sector as a whole. This could be done with a combination of subsidies and tariff protection of varying strengths, up to and including nationalization, with operation by government employees or by private sector contractors. The issue is at what cost. Such moves are often expensive relative to the option of continuing to buy from foreign suppliers – either because of the direct out of pocket expense of subsidies, or higher prices to consumers, or some combination of the two. Previous estimates have suggested that total direct and indirect costs can easily run into the low hundreds of thousands of dollars to preserve one job. Preserving jobs per se cannot be the long run justification for industrial policy.

For those still afflicted with visceral discomfort when contemplating government programs directly benefiting manufacturing industries, an historical perspective may provide some analgesic effect. Vannevar Bush, who headed the Office of Scientific Research and Development (OSRD) during the Second World War and laid out a proposed architecture for a postwar innovation system in *Science, The Endless Frontier* (1945), is given much of the credit for the design of the postwar U.S. innovation system. After the war ended Bush played an important role in persuading President Truman to endorse an enlarged federal role in funding basic scientific research and to support the establishment and funding of the National Science Foundation.

Bush argued that in the nineteenth century Yankee tinkering combined with mostly European scientific progress had been sufficient to propel the United States to world leadership in manufacturing. In the postwar period, he concluded, that would be insufficient, specifically referencing “Our spectacular development of the automobile, the airplane, and radio” but maintaining that none of this would have been possible without prior scientific advance from outside of the country. He then goes on to argue that future progress would be “most striking in those highly complex fields—electronics, aerodynamics, chemistry—which are based directly upon the foundations of modern science [and] a nation that borrows its basic knowledge will be hopelessly handicapped in the race for innovation” (Bush 1945, p. 87).

The U.S. came out of the war as the undisputed world leader in manufacturing production and productivity. But the country had in the past been living off of scientific seed corn provided by Europe, a source upon which the United States could no longer rely. And so Bush promoted basic research, located primarily in U.S. universities rather than government research facilities or private industry.

Although military procurement, research and development support, export financing, and other programs indirectly benefitted manufacturing in the immediate postwar period, the country shied away from direct support. This was in part for ideological reasons and in part because U.S. industries had worldwide dominance and were expected to retain it. Given what has happened since 1945, that presumption is no longer so obvious. If, in the postwar period, the U.S. embarked on a program to catch up and surpass the rest of the world in basic science, the rest of the world worked hard and with considerable success to catch up with the U.S. in manufacturing. Many of our trading partners, scrambling to close the productivity gap, developed extensive government policies specifically intended to support their traded goods industries. Germany, for example, rebuilt its manufacturing infrastructure, to a considerable degree with Marshall Plan aid, and was able, despite government budget deficits, to run current account surpluses, while compensating its workers at higher rates than their U.S. counterparts. One may as a matter of political principle prefer an ostensibly hands-off approach (in its history, the U.S. has been far from 'pure' on this account). But in the face of often successful industrial policies conducted by our trading partners, policies over which the U.S. can have only limited influence, more direct support as a means of protecting our national security, broadly defined, may become more acceptable, even for those traditionally skeptical.

It is difficult for many to let go of a romantic belief in American exceptionalism. In 1945 or 1948 there was, arguably, a case that the position of U.S. manufacturing in the world was indeed exceptional. But in this, as in other realms, the case for exceptionalism today is much weaker.

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