

**DEMAND & DEFECTIVE GROWTH PATTERNS:
THE ROLE OF THE TRADABLE AND NON-TRADABLE SECTORS IN AN
OPEN ECONOMY**

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Abstract: The U.S. economy is currently growing annually at about 2 percent in real terms and is well below its potential. The economy is demand constrained as a result of a large, negative domestic aggregate demand shock that followed from a decade of running on excess domestic demand. This excess demand was enabled by an unsustainable run-up in leverage and an accompanying asset price bubble. In short, prior to the recession, the U.S. exhibited a defective growth pattern. This paper focuses on the underlying structural elements of U.S. growth patterns, pre and post-crisis. The data suggest what theory would point to: as domestic aggregate demand retreats to more sustainable levels relative to total income, the tradable side of the economy is an important catalyst for restoring growth. As de-leveraging runs its course, domestic demand will bounce back to some extent; however, the economy will not re-leverage to the pre-crisis composition of domestic and external demand. The latter will grow larger. To shed light on these growth dynamics, we closely examine the tradable structure of the economy, uncovering its central characteristics and interactions with cyclical forces. A structural rebalancing is already occurring; the tradable sector generated more than half of gross gains in value added since the start of the recovery even though it is only a third of the economy. The growth of exports and the relative decline in import share, along with the rest of domestic demand, is causing the current account deficit to decline. However, there are also potential hurdles. Most of the post-crisis employment growth originated in largely non-tradable industries, indicating a continuing divergence between drivers of employment and drivers of value-added, with negative implications for the income distribution.

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Domestic and External Demand as Growth Drivers

For developing countries external demand plays a critical enabling role because it is large relative to small and fragmented domestic demand. This makes the tradable sector an important early-stage growth driver; it absorbs surplus labor, increases productivity and generates demand that then spills over to the non-tradable sector. Issues related to the level and composition of domestic aggregate demand and the balance between the non-tradable and tradable sectors are at the core of analysis on sustainable growth paths during every phase of a developing country's evolution including its early stages of growth and the middle income transition of the type China is now undergoing.

There are lessons in developing market growth analysis for advanced economy growth analysis, but the latter has focused largely on the important issues of incentives and drivers of TFP growth – the Schumpeterian dynamics of the supply side. While these models place importance on the composition of demand with respect to domestic consumption and investment, they are usually closed economy models. Thus, excess domestic aggregate demand financed with external debt--and its impact on the structure of the supply side of the economy, in particular the balance between the tradable and non-tradable sectors--does not typically appear.¹

Based on how the recession materialized and propagated in the U.S. and abroad, the close connection between balance sheet dynamics and stable patterns of growth has become conspicuous. This connection has been the focus of some important analyses. In 2000 Godley and Wray declared that “Goldilocks is doomed” in reference to the U.S. economy. They examined the salient features of the American economy at the time: a federal government surplus, a large and growing current account deficit, and the private (households and firms) sector's large deficits.² They argued that if budget surpluses and a large current account deficit were to persist, the private sector would have to continue accruing ever-increasing debt. Since firms had historically run small deficits and were already shouldering significantly more debt than typical, the authors concluded that a large portion of the burden would fall on households going forward—households that would eventually lose their ability to take on more debt. While the federal budget would eventually return to a deficit, it was met with a rising current account deficit, not a sustained rise in private savings from households or firms. In short, it was an unsustainable growth pattern. In structural terms, it caused the non-tradable side of the economy to become too large at the expense of the tradable side. Eight years later, we saw the full consequences of Godley and Wray's predictions as the Great Recession commenced.

¹ There are a few growth models that allow a role for external debt (Otani and Villaneuva 1989; Bhandari, Haque, and Turnovsky 1990; Mariano and Villanueva 2005, 2007). However, these models tend to rely on a small country assumption, which makes their application to the U.S. case dubious.

² Where deficits are defined as the difference between net investment (purchases less depreciation on existing stock) and net saving (disposable income less outlays).

The U.S. economy is currently growing annually at 2 percent or less in real terms and is well below its potential. According to Congressional Budget Office estimates of potential GDP, the output gap, in real terms, stood at -843 billion USD as of the last quarter of 2012. Post-crisis, the economy is demand constrained as a result of the large, negative demand shock that followed from a decade of running on excess domestic demand, enabled by excess leverage and an accompanying asset bubble. Domestic aggregate demand (consumption, government, and investment – public and private) exceeded what we produced and we borrowed the difference from the rest of the world.

To be more precise, it is the non-tradable side of the economy that is demand constrained. While the negative demand shock also impacted the tradable sector, there are two components of the tradable sector's demand: domestic and external demand. Therefore, strictly speaking, the tradable sector is not demand constrained since it can access external demand. Nonetheless, it is constrained by productivity in relation to incomes (that is, competitiveness) at the margin.

What, in qualitative terms, was wrong with the pre-crisis growth pattern in the U.S.? As alluded to above, both the level and composition of aggregate demand are central in this narrative. The supply-side of an economy follows demand (directly, in the case of the non-tradable sector). Thus, if the composition of aggregate demand is out of balance, the structure of the supply-side will follow it and be out of balance too.

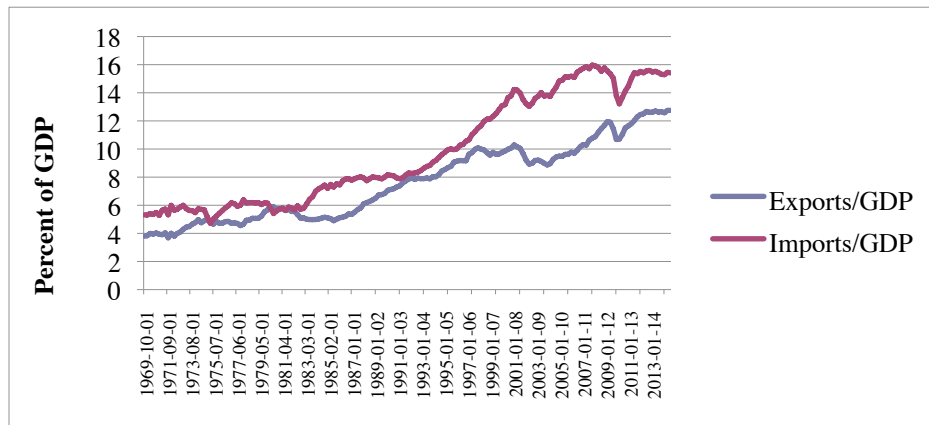
The U.S. (and a number of other advanced economies) had several interacting imbalances as it approached the start of the crisis. Primarily, the tradable sector was crowded out at the margin due to outsized domestic aggregate demand and a very accommodative inflow of capital from the rest of the world that led to a booming non-tradable sector. With reduced scope, tradable sector employment, particularly in the middle-income range, fell. Lower value-added components of increasingly atomized global supply chains also moved abroad.

Second, household consumption was too high and saving too low, enabled by what turned out to be illusory gains on the asset side of their balance sheets. Third, government fell into deficit and contributed to the savings shortfall. Fourth, public sector investment fell short of levels needed to sustain full potential growth and, while other aspects of the defective growth pattern are now in reversal, this problem persists and is likely to continue for some time.

To be fair, the employment challenges faced in the tradable sector (the details of which we will come to later) were not entirely caused by a crowding out effect on the tradable side. Major contributing factors included (1) labor saving technology advancements across the entire economy, which reduced employment in routine white and blue-collar jobs, and (2) a shift of tradable middle income jobs to other countries as the efficiency, complexity, and mobility of global supply chains rose. Still, excess aggregate demand made the problem of employment in the tradable sector worse than it otherwise would have been.

The composition of aggregate demand has been shifting. Figure 1 shows exports and imports for the U.S. in the post war period. Over the long-term the U.S. is becoming more trade exposed as advanced and emerging economies increase their share of global GDP and their incomes and purchasing power rise. Beginning in the 1980s, and then accelerating during the 1990s, imports rose as a fraction of GDP. Exports rose too, but lagged import growth, particularly from the mid 1990s to early 2000s. The recent catch-up of exports began with the onset of the Great Recession.

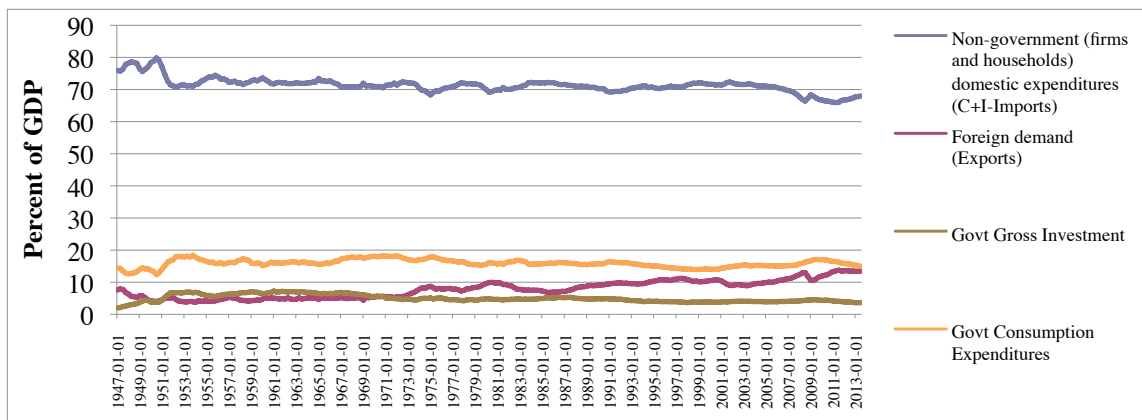
Figure 1: Exports and Imports, Q1:1969 to Q2:2013 (Percent of GDP)



Source: Bureau of Economic Analysis and authors' calculations.

If we consider the components of aggregate demand that affect the structural evolution of the supply side of the economy, one way to illustrate them is shown in Figure 2. Domestic aggregate demand consists of government consumption and investment, and private sector consumption and investment minus imports. External demand is captured by exports.

Figure 2: Components of Demand for the Domestic Supply Side, Q1:1947 to Q3:2013 (Percent of GDP)



Source: Bureau of Economic Analysis and authors' calculations.

Strikingly, despite a rise in imports in the 1980s and 90s, the share of domestic non-government aggregate demand did not decline until the Great Recession. Since then, external demand has begun filling the gap left by the fall in non-government domestic demand. For the extended period before the crisis, the economy was near full employment. With domestic aggregate demand elevated, labor and other factors of production were pulled towards the provision of a domestic consumption basket. At the margin, the elevated domestic aggregate demand and the accompanying capital inflows reduced the scope of the tradable supply side via an impact on factor prices, costs, and the exchange rate. Net, our competitiveness fell.

In this paper, we first employ a sector balances accounting approach as a lens with which to examine the U.S. economy, the same approach that served as the foundation for Godley and Wray's (2000) analysis and has been used by many others (e.g. Friedman 1987; Mann 2000; Bezemer 2010; Koo 2011; Papadimitriou et al. 2013).⁴ The framework provides a way for examining what Brainard and Tobin (1968) deemed "essential interdependences." It illustrates how we ran into trouble, what reasonable bounds might be for sector financial balances in order to avoid future defective growth patterns, and possible routes to a stronger recovery.

An important part of a recovery from the collapse of this defective growth pattern is a further structural rebalancing towards the tradable sector, a process that is currently underway in the U.S.⁵

To better understand how such a rebalancing might take place, we then take a deeper look at the structural evolution of the economy, uncovering its central characteristics and interactions with cyclical forces. Our exploration of the way in which U.S. structure interacts with sector balances differentiates our work from others who adopt a sector balances framework. To do so, we employ Jensen and Kletzer's (2005) approach for measuring the tradability of an industry based on its geographic concentration. The data show that external demand is already helping shift the U.S.'s structure back towards a more sustainable balance; the tradable sector has generated more than half of gross gains since the start of the recovery even though it is only a third of the economy. Going forward, there exist encouraging areas of opportunity along both the intensive and extensive margins in the tradable sector.

However, there are also potential hurdles to this growth pattern. Most of the post-crisis employment growth has originated in largely non-tradable industries, indicating a

⁴ Our adoption of this framework is not meant to be a dismissal of recent theoretical advances in macroeconomics. Rather, our choice hinges on the ability to simply present the workings of the U.S. economy in an abstract form that does not lose too much when it comes to reality. This approach is not a panacea, but it does quite quickly and convincingly give us some insight on how economies like the U.S. can end up in defective growth patterns and how we might avoid them going forward.

⁵ This does not show up in most growth models because they are closed country models as opposed to open economy models. In that setting everything is non-tradable so the distinction disappears. Further, it is not possible in a closed economy to consume and invest more than you produce. In the closed model, you can over or under invest with consequences for the levels and growth of income and consumption, but defective growth patterns that persist and then have sudden stop inflection points are harder to generate.

divergence between drivers of employment and drivers of value-added. This trend has and will continue to result in worsening income inequality since average value added per job, a measure correlated with annual incomes, in the tradable sector is larger than non-tradable value added per job by a factor of roughly 1.6.

In addition to its methodological links with papers that employ a sector balances accounting approach, this research complements several other areas of the literature. Since long periods of strong growth tend to reflect more sustainable growth patterns, our research is associated with literature on growth spell durations and their determinants (e.g. Hausmann, Pritchett, and Rodrik 2005; Johnson, Ostry, and Subramanian 2007; Castro 2010; Berg, Ostry, and Zettelmeyer 2012). However, most of the growth spell literature centers its analyses on developing markets, where fundamentals like protection of property rights, avoiding civil unrest, regime change, and distorted exchange rates tend to dominate growth sustainability in these economies. There also is a growing body of work that explores the role of various sectors' balance sheets in the recent recession (Mian and Sufi 2009, 2010, 2011, 2012; Cetorelli and Goldberg 2012). These papers analyze the dynamics and spillover effects of individual sectors, whereas our approach uncovers interacting effects between sectors.

Given our focus on the structure of the U.S. economy, this analysis also complements the large body of structural trend research (e.g. Rowthorn and Ramaswamy 1999; Imbs and Wacziarg 2003; Guerrieri and Meliciani 2005; McMillan, Rodrik, and Verduzco-Gallo 2013). We add to this literature by connecting trends in flows to structural outcomes and by explicitly distinguishing between the tradable and non-tradable sectors as a basis for our analysis.

The next section introduces the accounting framework, providing illustrative examples of how it can clarify the idea of defective growth patterns under the context of sector financial balances. We then turn to a discussion of the structural framework of the economy, introducing the classification methodology and some characteristics of the U.S. economy. The subsequent section explores the channels that link structure and growth, before turning to a closer look at the post-crisis recovery period. Finally, we discuss some of the opportunity areas and hurdles going forward with a quick comment on why a current account surplus and excess investment levels could present alternative difficulties, as in the case of China, before concluding.

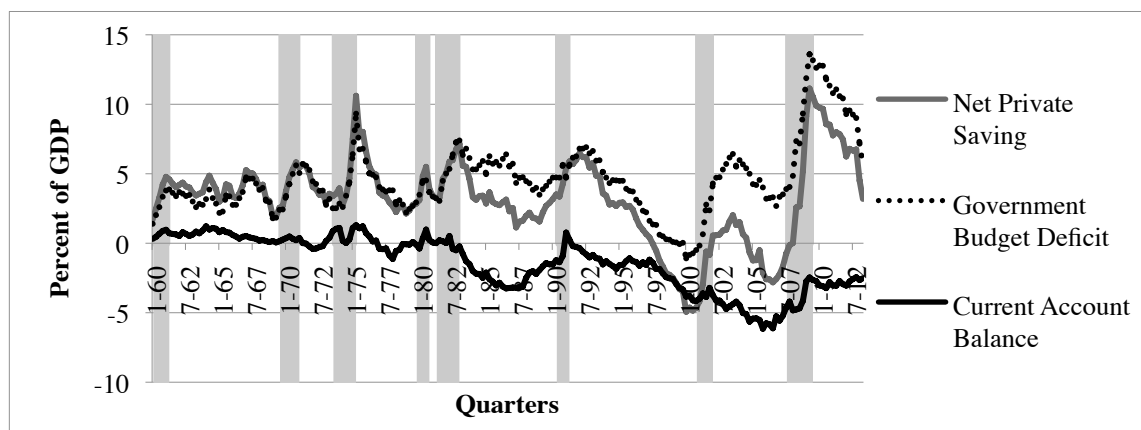
A Sector Financial Balances Framework

Even in an open economy, financial flows are closed; that is, every sector's surplus (or deficit) must be offset with other sectors' deficits (or surpluses). This double-entry accounting approach results in the following identity:

$$\text{Net private savings} = \text{Government deficit} + \text{Current account balance}$$

The relationship between the three sectors' balances can be seen in Figure 3, which uses data from the National Product and Income Accounts (NIPA).

Figure 3: Sector Balances (1960-2012)

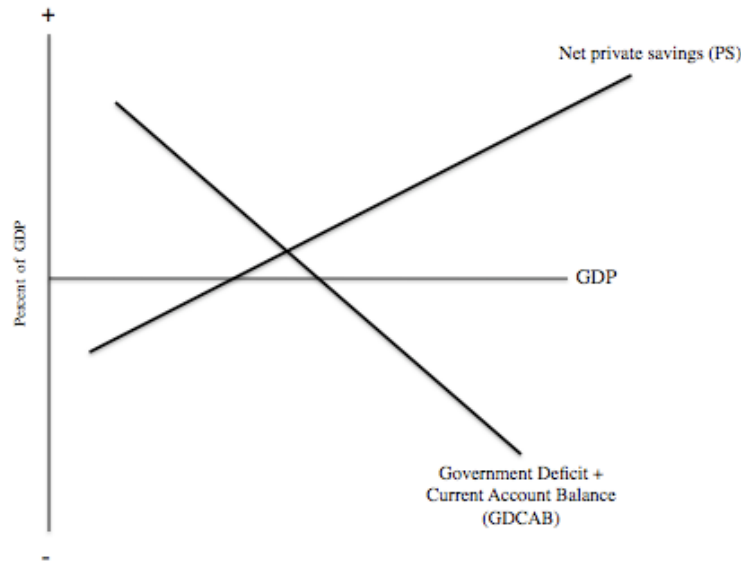


Source: Bureau of Economic Analysis, NIPA Accounts. Recessions are in gray and based on the NBER's business cycle dating committee's peak and trough dates.

Flows in household and firm balance sheets enter as net private savings, while the impact of integration and aggregate demand imbalances with the rest of the world are represented by the current account balance. Overtime, these flows translate into larger (or smaller) stocks. In the case of households and firms, these stocks are net private household and firm wealth. For government, stocks are public debt net of government assets. Finally, current account balance flows translate into net stock of overseas assets. For households, in particular, saving flows serve as an imperfect proxy for actual savings activity in the household sector given some outages in NIPA's measures of income.⁷ The identity can also be depicted as a graph seen in Figure 4 (Fullwiler, 2009).

⁷ NIPA's measures of income and savings are not a perfect representation of households' standing. Capital gains, capital transfers, and natural disasters all impact household net worth, but are not included in NIPA measures since they do not relate to current production. For our purposes, the most worrying exclusion is capital gains, which were large and positive during the asset price bubble of the 2000s. However, capital gains are included when it comes to personal outlays in the form of taxes on capital gains, creating a systematic bias in income's measurement. There is a vibrant debate on whether or not capital gains should be included in NIPA given their volatile nature, particularly in the presence of bubbles. What is clear is that as capital gains increase in importance to households, NIPA's saving rate measure becomes increasingly biased downward. NIPA also sources its income data from IRS filings, payroll data, and corporate reports. According to Guidolin and La Jeunesse (2007), the aggregated income data typically sum to less than GNP by 2 to 3 percent, meaning that NIPA's measures of income and saving are too low and undergo frequent, large revisions. Regardless of its shortcomings, the NIPA savings measure does seem to capture general trends in household savings behavior, despite not getting the magnitudes perfectly right.

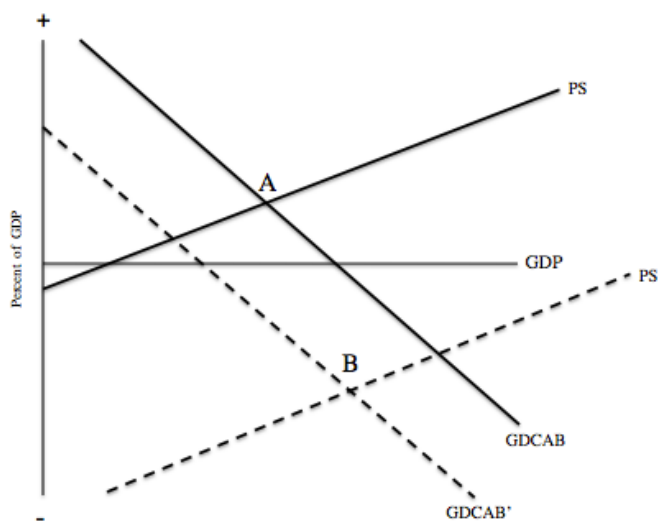
Figure 4: Accounting Framework



Since both the government deficit and current account balance tend to move counter-cyclically with GDP, the two can be combined in a downward sloping function. As GDP falls, the government deficit tends to rise as take up of unemployment insurance and related social safety nets increase (i.e. automatic stabilizers counteract the fall in GDP). Similarly, with a fall in GDP, we also tend to see an improvement in the current account deficit as imports typically fall. Net private saving, on the other hand, is positive related to increases in GDP; higher incomes tend to yield higher savings. Intersections of the two curves are the “point in time” offsetting balances of all three components. Shifts in each curve represent changes in sector behavior, whereas movements along each curve are based on functional relationships as briefly laid out. For instance, the increase in the deficit due to automatic stabilizers represents a movement upwards and along the GDCAB curve, whereas the introduction of a fiscal stimulus is a shift outwards in the GDCAB curve. Employment responds positively to increases in GDP and negatively to drops in GDP.

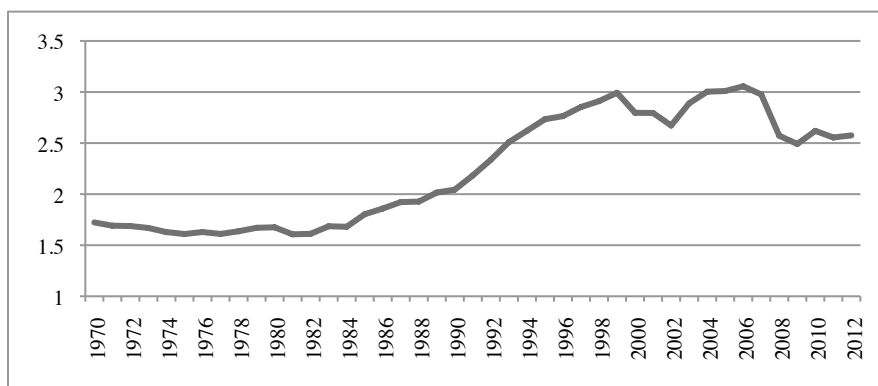
To illustrate how this simple depiction can provide insight about the US economy, consider the below examples, also discussed by Fullwiler. Point A characterizes the economy in the mid 1990s, prior to the Clinton budget surplus era (see Figure 5). There was a government deficit, which outweighed the magnitude of the current account deficit and net private savings were positive. Towards the late 1990s, steps were taken to bring the budget into the surplus. At the same time, the Asian crisis was unfolding, contributing to a rise in the current account deficit. Together, these two effects implied an inward shift in the GDCAB curve to GDCAB' in Figure 5.

Figure 5: Pre-Great Recession Examples



The late 1990s also featured a marked rise in the appetite of the private sector for leveraging. We can proxy leverage ratios following the methodology of Taylor (2012), where we compare levels and changes in broad money to levels and changes in credit.⁸ The ratio of domestic credit provided by the banking sector to broad money was rather stable at around 1.7 from 1970 to 1984 (see Figure 6 below). By 1999, it stood at 3.

Figure 6: U.S. domestic credit provided by banking sector/ broad money



Source: World Bank's World Development Indicators (2013)

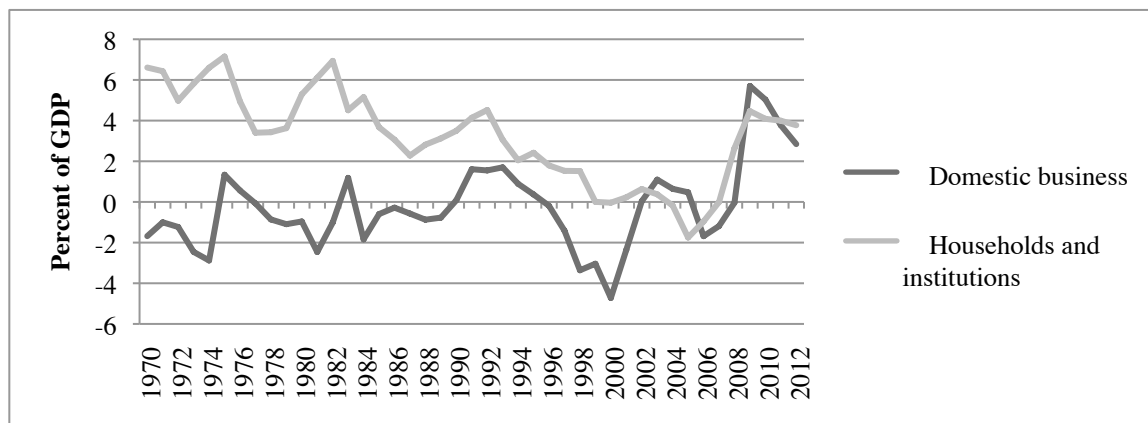
⁸ The World Bank and IMF define broad money as “the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler’s checks; and other securities such as certificates of deposit and commercial paper.” Domestic credit provided by the banking sector is defined as including “all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits).”

The increase in the private sector’s leveraging implied a downward shift in the PS curve to PS’. Thus, at the end of the 1990s, the U.S. economy stood at point B, with a negative and growing current account deficit, a budget surplus, and negative net private savings.

After the recession of the early 2000s, a temporary period of deleveraging took place; however by 2004, the ratio had risen back to 3, remaining there until the start of the Great Recession (see Figure 6). Mian and Sufi (2011) estimate that homeowners borrowed \$1.3 trillion against the appreciating value of their homes between 2002 and 2006, over 2 percent of the period’s total GDP.

In recent years, the domestic credit to broad money ratio has stabilized around 2.5. While it does not bring us back to levels seen prior to the mid-1990s, it does represent a meaningful shift in the right direction. Both households and domestic firms have reduced their debt burdens in the wake of the crisis (see Figure 7).

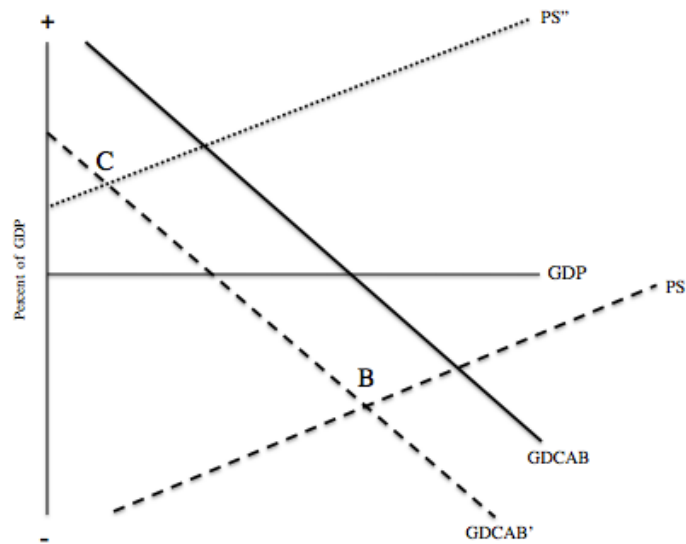
Figure 7: Firm and Household Balances (1970-2012)



Source: Bureau of Economic Analysis’s NIPA Tables. Institutions are defined as nonprofit institutions serving households.

Net, this implies that the economy’s PS curve shifted upwards to PS’’. The economy now stands at a point similar to C (see Figure 8). The move from point B to C led to a sharp decline in GDP, growth in the government deficit, and a decline in the current account deficit, where the increase in the government deficit outweighed the decline in the current account deficit.

Figure 8: Great Recession Example



This recent shift in the PS curve also tells us something about the sustainability of certain growth patterns. If we allow for the above framework to take on a more dynamic nature where instead of discrete shifts there are continuous marginal changes in behavior over time, then one could imagine that as the economy moved from A to B the sustainability of such a growth trajectory became more tenuous as the economy approached B. That is, as balance sheets continued to deteriorate in the private sector and the economy accrued greater and greater risk, we approached an imprecise bound on what burden households and firms could bear.

To emphasize this point, flows in any given year are not the source of defective growth patterns. It is the persistence, or sticky nature, of certain trends in flows that (1) translate demand-side distortions into supply-side distortions and (2) contribute to increased stocks that eventually will hit a bound, requiring a correction in the sector balances. Based on the domestic credit to broad money ratio, the current bound for firms and households seems to be around 3, and cannot be maintained for too long. Of course, there has also been considerable research on the bounds for the current account deficit and the government deficit.

Many characterize a current account deficit to GDP ratio in excess of 4 to 5 percent as unsustainable (Mann 1999; Mussa 2004; Freund 2005; Freund and Warnock 2007).⁹ However, the so-called “valuation channel” can help offset the detrimental debt effects of a large current account deficit, increasing its sustainability in the short-run. Since U.S. foreign liabilities are primarily denominated in U.S. dollars and U.S. foreign assets are primarily denominated in foreign currencies, a dollar depreciation results in a relative decrease in U.S. liabilities and a relative rise in U.S. assets. Stronger relative asset prices

⁹ A current account balance is deemed sustainable if “neither it, nor the associated foreign capital inflows, nor the negative net international investment position are large enough to induce significant changes in economic variables, such as consumption or investment or interest rates or exchange rates.” Mann (2002).

abroad similarly improve the net international investment position. Lane and Milesi-Ferretti (2007) found that the average real return on assets from 2001 to 2004 was 4.8 percent while the average real return on liabilities was -0.4 percent, driven by a 15 percent depreciation of the real effective exchange rate and relatively more bullish stock markets abroad. Gourinchas and Rey (2007) also explore the valuation channel and find that it historically has been able to absorb roughly 30 percent of cyclical external imbalances in the short horizon. Note, however, that dollar depreciation should not be viewed as a complete fix to a large current account deficit; as Obstfeld and Rogoff (2007) note, “[t]he lion’s share of the adjustment has to come from saving and productivity shocks that help equilibrate global net saving levels and that imply dollar change largely as a by-product.”

When it comes to the government deficit, the issue of sustainability relates more directly to rising public debt stocks that stem from running large deficits. The general rule is that debt stocks cannot rise faster than GDP for an extended period, since servicing that debt will absorb an increasing portion of output overtime. Sustainability relies on the expectations of investors on the credibility of the government. If investors start to worry that the government will not honor its obligations (i.e. risk of default) or that it will monetize the debt (in the federal government’s case, via inflation), then they will be less willing to hold it at reasonable interest rates. As borrowing becomes more costly for the government, a vicious cycle ensues as the deficit grows even faster and borrowing costs continue rising; recent experiences in the Eurozone illustrated this point. We focus on the federal deficit, which is much larger than combined state-level deficits.

Thus far, despite the historically high deficits in recent years, investors do not view the debt levels as unsustainable since yields on Treasury notes have fallen post-crisis.¹⁰ In fact, yields are historically low; at the end of 2012, yields on 30-year notes were below 3 percent for the first-time since the 1950s (Labonte 2012). Long-term yields have since risen to just under 4 percent but still have not reached their pre-crisis levels of roughly 5 percent. Looking at credit default swaps for U.S. treasuries, investors priced the risk of government default at less than 2 percent in the days leading up to the October debt ceiling deadline.¹¹ The Fed’s quantitative easing programs have also contributed to the historically low yields. In particular, QE2, which targeted Treasuries, signaled a commitment on the Fed’s side to keep interest rates low for the foreseeable future and raised the premium that investors seeking safe assets were willing to pay since the supply of long-term Treasuries fell. Both channels lowered yields on long-term Treasuries (Krishnamurthy and Vissing-Jorgensen 2011, 2012).

Still, for the level of debt to remain sustainable some major changes must be undertaken to bring the budget deficit back to a manageable level—namely, finding reasonable solutions for growing Social Security and health program costs as well as finding ways to increase revenue without imposing too great a tax burden. The question regarding these

¹⁰ The federal debt to GDP ratio is currently about 73 percent, the highest ratio in the post-war period.

¹¹ Childs (2013).

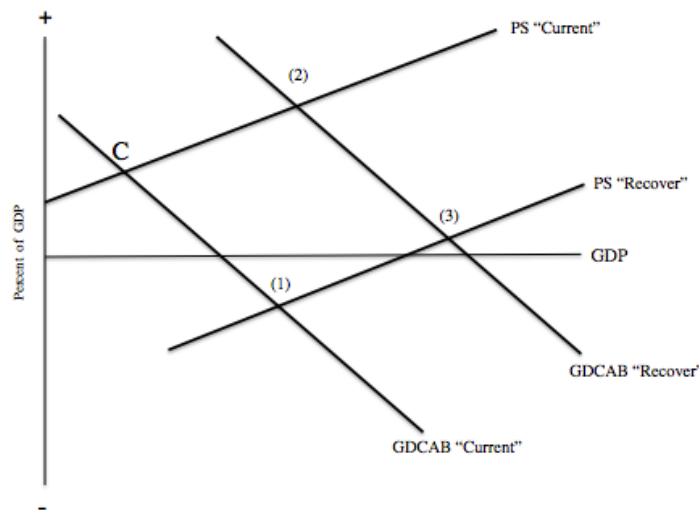
changes is when, not if, they should be imposed. Given the current economic environment, both here and abroad, now does not seem like the opportune time.¹²

Possible Paths to Recovery

A benefit of this simple representation of the U.S. economy is that it also suggests what paths of the recovery might look like. There are three options for getting the economy running again: (1) a shift downward in PS, (2) a shift outward in GDCAB, and (3) some combination of (1) and (2) (see Figure 9). We consider each in turn.

A shift downward in PS (1) would suggest systematic re-leveraging, either by households, firms, or both. We see some evidence of a slowed pace in the deleveraging process in the net private savings data from 2010 to 2012 (see Figure 7).¹³ Still, net private savings remain quite positive for both firms and households.¹⁴ A slowdown in the deleveraging process is allowable and could be represented with a small shift downward in the PS curve that places net private savings above or near zero. However, with a large shift, net private savings will become negative and move the economy back towards the pre-crisis demand and growth pattern. Thus, a shift in the GDCAB curve is more desirable.

Figure 9: Options for Recovery



¹² Our comments here are in line with Congressional Budget Office's (2013) discussions of the current U.S. budget outlook.

¹³ Surely a significant portion of the slowed pace in the deleveraging process, particularly on the firm side, is driven by the Fed's quantitative easing campaign. If the Fed begins tapering, this trend will moderate. On the household side, student and auto loan debt have increased in the post-crisis period. All other types of household debt—mortgage, credit card, HE revolving, and other debt—have fallen in the post-crisis period. Based on data from the Federal Reserve Bank of New York, November 2013 Quarterly Report on Household Debt and Credit.

¹⁴ The November 2013 unemployment rate stood at 7.0 percent; however, when one includes underemployment (all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force) the rate stands at 13.2 percent.

A shift outward in GDCAB already occurred, in the form of the 2009 fiscal stimulus. By and large, economists tend to agree that it led to positive GDP growth, particularly with respect to its Medicaid and infrastructure components (e.g. the Chodorow-Reich et al. (2012) and Feyrer and Sacerdote (2011) papers find fiscal multipliers in the range of 2 for these types of spending). Even for critics of the stimulus, like Taylor (2011), the critique seems to be that not enough of it was allocated to direct government purchases. Alternatively stated, the stimulus did not have a first best allocation.

As we sit here at the start of 2014, it is clear that there is more to do if we are to accelerate this painfully slow recovery in a sustainable manner. The defective growth pattern that might stem from another aggressive re-leveraging period and the recent commencement of the Fed's tapering program make (1) an unlikely outcome. Also, an additional fiscal stimulus is improbable in foreseeable future given our current debt levels and the political climate. Thus, a preferred alternative would be a structural shift that improves the current account balance and shifts the GDCAB to the right (2). If we allow for some re-leveraging (or at least a large drop in net private savings) in combination with a shift in the GDCAB curve via an improvement in the current account balance, then there are a continuum of possible outcomes south-east of (2) as we approach (3). However an outcome closer to (2), which requires an improvement in the current account balance, is the main opportunity for sustainable growth.

Examining the balances depicted in Figure 3, the current account balance has become increasingly negative in the 1990s and 2000s, offsetting large government deficits and positive private savings. The increase in current account deficits can be partly ascribed to a rapid increase in U.S. integration over the past two decades via the launch of NAFTA in and the World Trade Organization in 1994, the signing of over 300 trade agreements under the Clinton administration, the conferral of Permanent Normal Trade Relations to China in 2000 (and eventual accession to the WTO in 2001), and high capital inflows from abroad.¹⁵ A central prerequisite for determining what scope there is for an improvement in the current account balance is understanding the dynamics of the tradable and, in turn, non-tradable sides of the economy. Alternatively stated, we need to understand the evolving structure of the U.S. economy, the subject that we now turn to.

Exploring the U.S.'s Structure: the Tradable and Non-tradable Sectors

The tradable side of the economy includes most manufactured industries and a range of service sectors like finance, consulting, managing multinational enterprises, computer design, R&D, IT administration, and customer service. The non-tradable side includes most of government, health care, education, construction, retail, hospitality (hotels, restaurants, food service), and several administrative services.

¹⁵ We abstract from a discussion about exchange rates here; however, there was a general trend in appreciation of the dollar throughout the 1990s and a depreciating trend in the 2000s.

In an advanced economy, the non-tradable sector is roughly two-thirds of the economy while the tradable sector is one-third. In the U.S. and, in fact, globally, the tradable part of the economy is expanding as a share overtime. More services are becoming tradable and this trend is likely to continue, absent policy-induced blockages. The trend is predominantly due to technology, especially network-based information technology, combined with management and organizational learning on how to use the technology to create integrated and efficient value chains and networks.

Technology has also enabled the efficient atomization of global supply chains: breaking them up into a rising number of parts located in different countries, regions, and cities. The rising import content of exports reflects this trend. This means that functions that used to require proximity, because of the challenge of communication and coordination in the absence of proximity, can now be split up to follow available human resources and other capabilities wherever they are located. And functions that formerly enjoyed protection from external competition because of proximity requirement no longer enjoy that protection. The growing share of the tradable sector underlines the importance of placing the growth dynamics associated with it in focus.

Standard industry classifications do not match up perfectly with tradability. Some sectors are clearly on one side of the ledger or the other, but some like professional services are hybrids. In order to proxy the tradability of an industry, we rely on Jensen and Kletzer's (2005) measures of geographical concentration of industries using locational Gini coefficients, which are based on employment measures. The intuition is as follows: non-tradable goods and services (e.g. hair salons and cement suppliers) tend to be located everywhere, whereas tradable goods and services (e.g. financial services and manufacturing production) tend to be concentrated geographically. The latter's geographical concentration can be explained via a number of mechanisms, namely the gains from economies of scale in tradable industries (Helpman and Krugman 1985).

To avoid classifying non-tradable industries that are concentrated due to outsized, concentrated demand as tradable, Jensen and Kletzer allow for non-tradable industries that are inputs of downstream industries to follow the geographical distribution of said downstream industries (rather than relying on a measure of income for demand). The first component of the Gini measure is industry demand share, which measures the concentration of demand for industry i in region p and is calculated as follows:

$$\text{Industry Demand Share (IDS)}_{i,p} \equiv \sum_j \left(\frac{Y_{i,j}}{Y_i} \times \frac{\ln EMP_{j,p}}{\ln EMP_j} \right)$$

Where

$Y_{i,j}$ = output of industry i used by industry j ;

Y_i = total output of industry i ;

$\ln EMP_{j,p}$ = industry j employment in region p ; and

$\ln EMP_j$ = total industry j employment

The industry demand shares (IDSs) are then used as an input to calculate locational Gini coefficients by industry:

$$Gini(G)_i = \left| 1 - \sum_p (\sigma Y_{i,p-1} + \sigma Y_{i,p}) \times (\sigma IDS_{i,p-1} - \sigma IDS_{i,p}) \right|$$

Where p 's index regions, sorted by share of industry employment and

$\sigma Y_{i,p-1}$ = cumulative share of industry i employment in the

region $(p-1)$ with the next lowest share of industry employment;

$\sigma Y_{i,p}$ = cumulative share of industry i employment in the region p ;

$\sigma IDS_{i,p-1}$ = cumulative share of industry i IDS in the region $(p-1)$ with the next lowest share of industry IDS; and

$\sigma IDS_{i,p}$ = cumulative share of industry i IDS in the region p

A low Gini corresponds to a highly non-tradable industry, while a high Gini corresponds to a highly tradable industry.¹⁶ These measures were constructed using the 1999 input output use tables from the Bureau of Economic Analysis and the 2000 Decennial Census of Population Public Use Micro Sample (PUMS). Admittedly, these measures pick up domestic tradability more than internationally tradability. To that end, we make some value judgments about the classifications of certain industries as internationally tradable.¹⁷

Applying the industry tradable/non-tradable splits, we then use seasonally-adjusted employment data by industry from the Bureau of Labor Statistics' Current Employment Statistics survey and value-added data by industry from the Bureau of Economic Analysis's data. The data for both employment and value added are at the two-digit level.

One weakness of this approach is that we assume tradability to be static overtime. For industries like manufacturing and agriculture that have always been wholly tradable, this point is not relevant (for instance, you still cannot get an auto mechanic from Bangladesh to inspect your car in Palo Alto, California). For industries that have benefitted greatly from the information technology and communication revolution (e.g. consulting, radiology, and payroll services), this outage is more worrying. However, most of these

¹⁶ Using their continuous measure of tradability, we classed Gini class 1 (below .1) as non-tradable proportions and Gini class 2 and 3 (above .1) as tradable proportions.

¹⁷ Legal services is once such example of an industry that appears domestically tradable, but tends to not be internationally tradable.

industries are classed as largely tradable already. Also, even among professional service industries that are increasing in tradability, only a small number of clientele are taking advantage of the ability to source services like architectural, computer systems design, and accounting services from abroad. Thus, in the aggregate, we feel our approach is reasonable. For the industry splits, see Appendix I.

One might wonder why we are classifying industries into their tradable and non-tradable components via this methodology when we have trade data available for both services and goods trade. There are several reasons. Primarily, if we are to determine the potential for improving the current account balance, we must understand the inner workings of tradable goods and service industries, whether they are currently traded or not. Trade data would only be able to point the fraction of an industry that is traded, not the fraction that is tradable.

Additionally, even if we assume that tradability is perfectly correlated with what is traded, the services trade data is still quite coarse, meaning that we would need to adopt industries as wholly tradable or wholly non-tradable since we are not able to break down what elements of each industry are being traded. While most industries are either completely tradable or non-tradable, our approach allows for industries like finance and insurance to be split appropriately between their non-tradable and tradable components.

Thirdly, it's still unclear how seriously we can take the data on service trade. Bernstein (2005) shares the following anecdotal evidence—

[T]hese [service trade] data, especially the highly relevant parts relating to information technology, are getting a bit hard to believe, given what so many firms are telling us about their service imports and what some other countries' service export data suggest. Take, for example, data on the value of imports of computer-related services, which includes software writing, from India. Even with recent large upward revisions, the tiny magnitudes of the BEA numbers for example, \$330 million in 2003 are hard to believe. The Indian tech trade group NASSCOM puts this value at \$4.7 billion. This is not to suggest that NASSCOM's data capacity is superior to BEA's. Rather, if you're out to identify service jobs affected by offshoring, most analysts are suspicious of the quality of our data on the import of some key services associated with offshoring.

Finally, while not all goods and services produced by tradable industries are traded, these industries face a very different competitive space relative to non-tradable industries. For example, while hair salons may compete locally, tradable services like call centers must compete internationally. These differences translate into very different dynamics across the two sector-types in both the value-added and employment data.

First, we share an overview of the tradable and non-tradable sectors in the U.S. economy.

As of June 2013, total employment stands at 136 million, up 27 million from 1990 (see Figure 10). Overtime, the non-tradable sector has increased as a proportion of total

employment. In fact, the tradable sector contributed only 2 percent of the net employment over the period from 1990 to mid-2013, although it has contributed more during the most recent recovery (see Figure 11). Health care, accommodation and food services, and administrative and waste services, and government (all largely non-tradable) feature as the largest increasing industries from 1990 to 2012 and account for two-thirds of the total net change in employment over the period. Largely tradable professional service industries also drove growth in employment (8 percent of total net increase, ranking 6th after government), however these tradable gains were offset by larger losses across the manufacturing industries.

Figure 10: Total Employment, 1990 to mid-2013

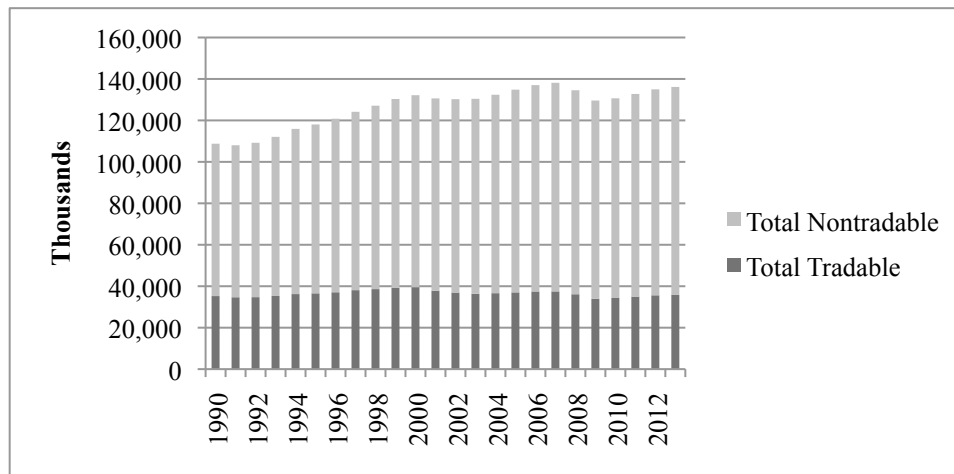
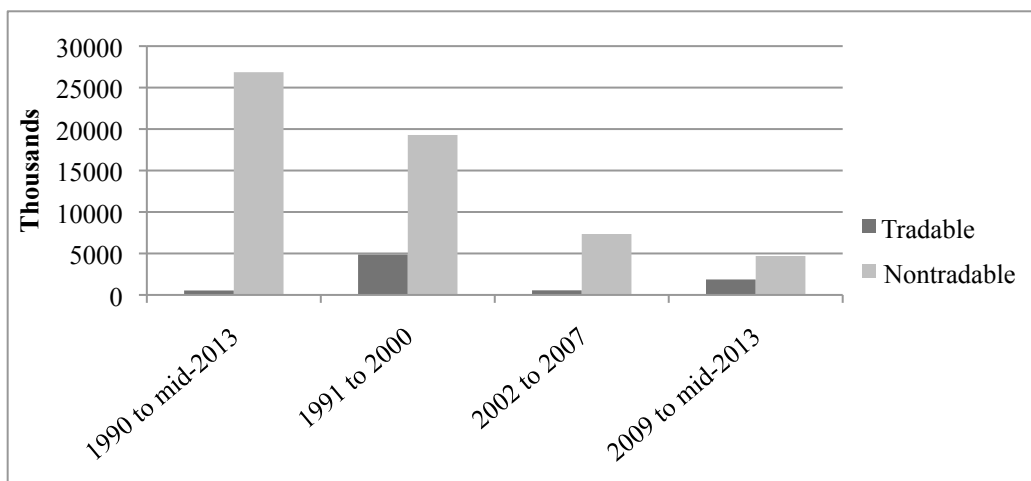


Figure 11: Change in Employment Over Different Periods¹⁸



Value-added, in billions of 2005 dollars, rose from 8.9 trillion in 1990 to 13.6 trillion in 2012 (see Figure 12). Unlike employment, the tradable sector contributed a sizeable

¹⁸ The periods were chosen based on NBER business cycle dates. The intent is to compare this recovery's characteristics with past "trough to peak" periods.

portion to the change (36 percent over the full period) and has been increasing in its contribution over more recent growth periods (see Figure 13). Still, non-tradable industries generated a large portion of the increase in value added; real estate, wholesale trade, retail trade, and health care topped the list, contributing 40 percent of the total net increase. Largely tradable industries like finance, insurance, and professional services also contributed substantially (20 percent as an aggregate over the period), reflecting the more balanced contribution of both the tradable and non-tradable sectors to the increase in value-added.

Figure 12: U.S. Tradable/Non-tradable Real Value Added, 1990-2012

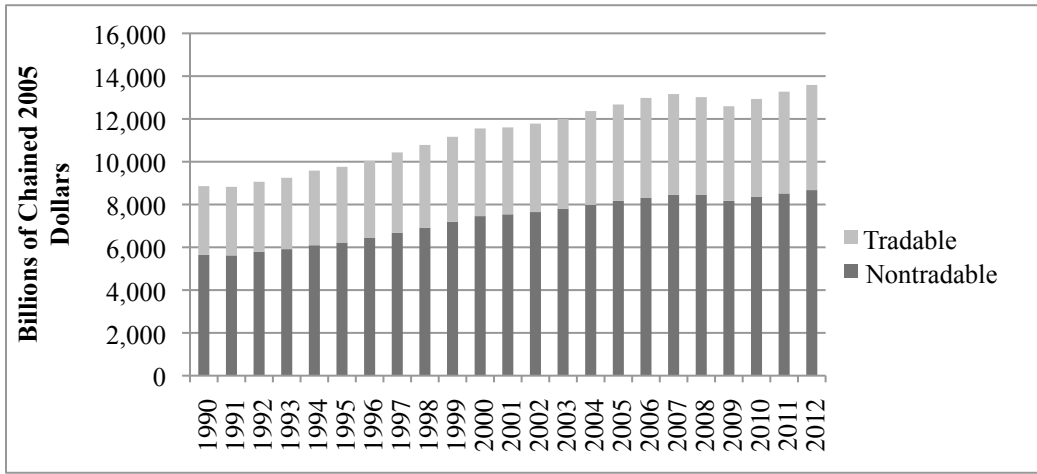
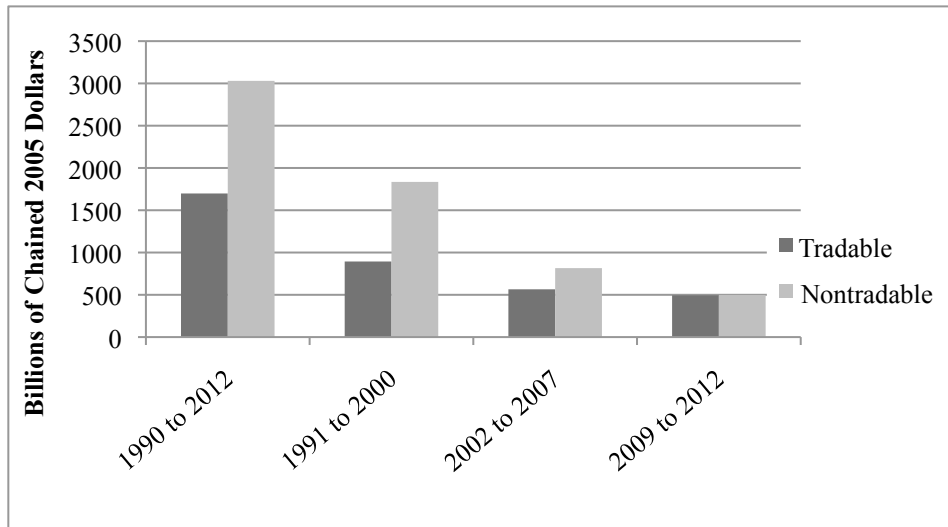


Figure 13: Change in Real Value Added Over Different Periods¹⁹

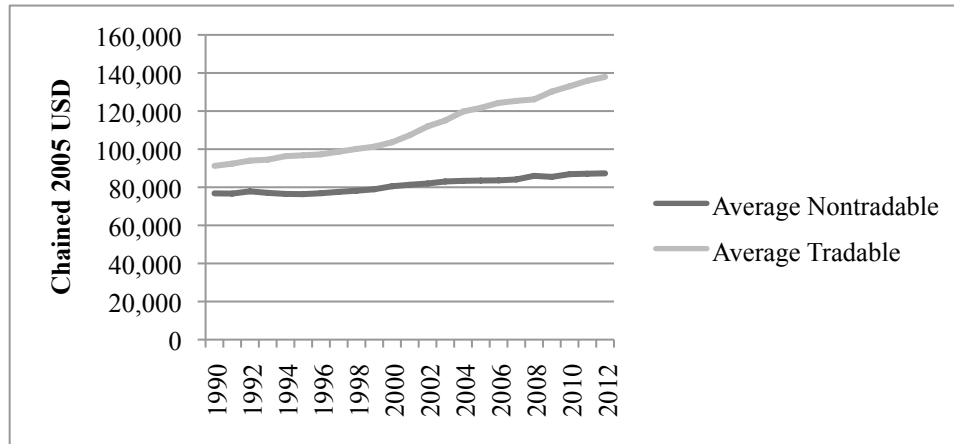


The pace of rising value added in the tradable sector is much faster than rising tradable employment, resulting in rising value added per job in the tradable sector (see Figure 14).

¹⁹ The periods were chosen based on NBER business cycle dates. The intent is to compare this recovery’s characteristics with past “trough to peak” periods.

In the non-tradable sector, growth in the two measures has occurred largely in tandem with one another, resulting in relatively flat value added per job over the full period. Value added per job is positively correlated with annual incomes, implying that the trend over the past two decades has been towards ever-increasing income inequality, because most of the jobs were created in the non-tradable sector where value added per job and hence average income growth have been limited. If we use value added per job as a proxy for income, what was once a \$14 thousand dollar difference between those working in the two sectors has become a \$51 thousand dollar gap.

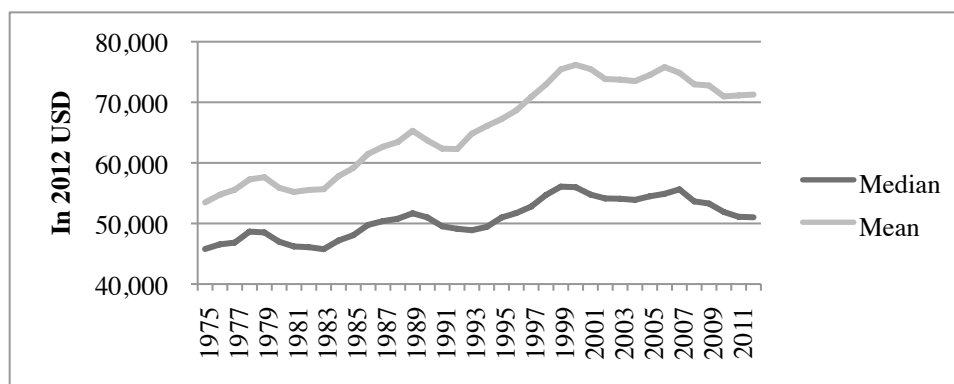
Figure 14: Weighted Average of Real Value Added Per Job (1990-2012)



Note: weighting based on industry share of employment

The relatively subdued growth in value added per person employed in the non-tradable sector where virtually all the incremental net employment was created, contributed to the adverse trend in the income distribution. One index of this trend can be seen in the growing gap between mean and medium income (see Figure 15).

Figure 15: Household Real Mean and Median Income, 1975-2012



Source: Census Bureau

To be sure, in this overview of the characteristics of both sectors we are leaving out a lot of interesting detail, both within sectors and across time. For the period leading up to the crisis, see Spence and Hlatshwayo (2012) for a data-intensive discussion of the structural

changes that occurred from 1990 to 2008. With respect to the post-crisis era, more detail will be given below.

How Structure Interacts with The Recovery : Tradability and Constraints on Growth

Now that we have a sense for what the tradable and non-tradable sides of the economy look like, we can discuss what role external demand might have in promoting growth. Every economy has a demand structure that divides demand between the tradable and non-tradable sides. As mentioned above, non-tradable demand must be met (by definition) by domestic supply. If there is an extended negative demand shock like the one we are experiencing, growth will be negative (the movement from point B to C in Figure 8) and then slow on the non-tradable supply side, which is what we are seeing now. Both employment and investment will fall.

The tradable side is different. Tradable demand is met with a combination of external and domestic supply, the former being imports. Similarly the markets for the tradable supply side are dual: the domestic market and external demand, the latter being exports. Thus while a negative domestic aggregate demand shock has a large and immediate effect on the non-tradable side, the effect is only partial on the tradable side. Further, for most countries the external demand is very large relative to domestic demand. Thus the tradable side can expand even if there is a shortfall in domestic tradable demand. Whether it actually does expand depends on competitiveness of the tradable supply side, which in turn depends on productivity in relation to income levels, the exchange rate, trade policies, infrastructure, and available technologies.

Given access to the world market, tradable demand and supply can diverge. If the U.S. runs a trade deficit of 6 percent of GDP that means imports exceed exports by 6 percent of GDP or more relevantly by about 18 percent of tradable supply, since the tradable part is about one-third of the economy. A crude way to put this is that the non-tradable side is demand-constrained in the medium term while the tradable side is productivity-constrained. Of course, on both sides, productivity growth will eventually turn into additional demand, with resulting growth. However, on the non-tradable side, if demand is deficient, the short and even medium run effect of productivity growth will be unemployment. Whereas, on the tradable side, productivity growth combined with restrained wage increases can translate moderately quickly into an expanded ability to serve external demand and, hence, growth, provided the economy is flexible and factors are mobile.

The absence of a binding demand-constraint on the tradable side of an economy makes it a potentially important catalyst in restarting growth. We say potentially because there are things that can get in the way, but we will come back to that. Income generated on the tradable supply side will generate additional demand on the tradable side but will also spill over in a substantial way to generate non-tradable demand. This happens quite quickly so that standard growth accounting can easily miss the causal linkages.

It is worth noting that the tradable supply-side specializes based on comparative advantage and its productivity determinants, but the demand-side does not shift around – it is relatively stable across the tradable/non-tradable sides and across countries. The exception is that levels of public sector investment and service provision differ across countries.

Why do these structural elements matter? They matter because it difficult to capture the growth dynamics in open economies, the potential for defective growth patterns and the recovery mechanisms without paying attention to the differential constraining elements on the tradable and non-tradable sectors.

The scope for developing self-limiting or defective growth patterns in an open economy setting is much larger. In a closed economy, excess domestic aggregate demand will lead to inflationary pressure and normally a central bank response that moderates the demand pressure by increasing saving or reducing investment or both. In the opposite case of a demand shortfall, you have countercyclical responses that work provided the fiscal balance in the public sector is not upset. Otherwise you have a natural but multi-year deleveraging and balance sheet healing process and that cannot be accelerated much. Perhaps aggressive monetary policy helps for a while. But in neither case does the economy get structurally out of balance.

In an open economy, things are quite different due to amplification and contagion effects. Prior to the crisis the U.S. was, as noted earlier, operating under a growth pattern in which domestic aggregate demand exceeded output. The current account deficit was large and negative. This was enabled by net capital inflows from surplus countries (China, Japan, Korea, Germany, oil producers etc), with the U.S.'s large and liquid capital markets and reserve currency status playing a role. That by itself is not necessarily problematic in the short to medium term. However, the internal leverage and obliviousness to rising systemic risk made the model defective.

The elevation of domestic aggregate demand above sustainable levels has similar effects to the “Dutch” disease for resource rich countries, a point brought to our attention by Edward R. Surendran of the Singapore Monetary Authority and raised by many others (e.g. Ebrahim-zadeh 2003 and Alford 2013). Structurally, the large inflows in foreign capital expanded the non-tradable sector and led to a shrinking tradable sector as the current account deficit grew in the early to mid 2000s, hitting a record level of 6 percent in 2006. While the U.S. also saw increasing price competitiveness via a decline in the real effective exchange rate (see Figure 16), the decline was not sufficient to offset the inflows of foreign capital that shifted resources towards the non-tradable sector.²⁰

²⁰ A rise in the real effective exchange rate corresponds to a deterioration in price competitiveness.

Figure 16: U.S. Dollar Real Effective Exchange Rate, Monthly (Jan 1990 to Nov 2013)



Source: Global Financial Data, 2013

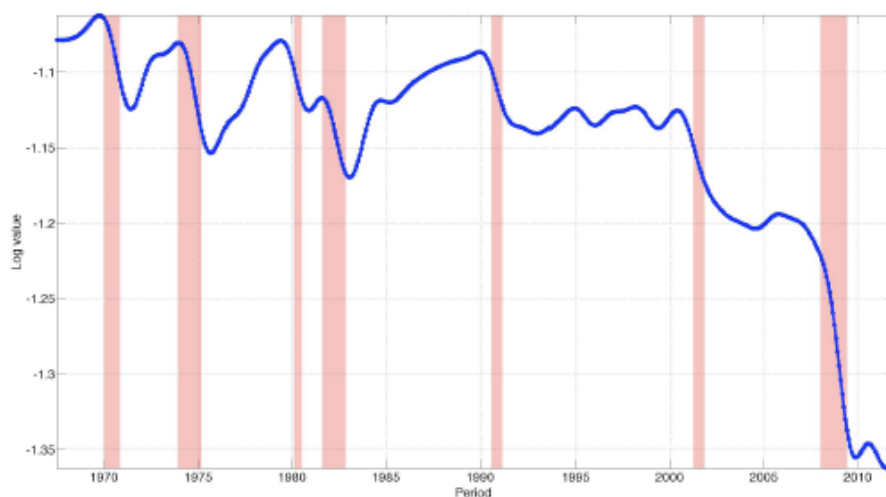
U.S. investment rates were also abnormally low, relative to other advanced countries, and probably too low to sustain growth without the boost coming from excess domestic aggregate demand. Both the level and efficiency of public sector investment in infrastructure and education were also problematic. Clearly savings fell short of even low levels of investment, hence the current account deficit and accompanying net foreign borrowing. Government deficits contributed to the problem.

As shared earlier, we know in this period (roughly 20 years prior to 2008) that both the tradable and non-tradable sides grew in value added terms, but the tradable side did not generate any meaningful gains in net employment. From a structural point of view, the non-tradable sector became too big, while the traditional tradable sector was competing with the non-tradable sector for resources and at the margin lost competitiveness. Clearly the arrival of China with its scale in manufacturing trade, its financial resources, and its pattern of excess savings contributed to the imbalances. The effects of such structural shifts showed up mainly in employment.²¹

Of course, there were two additional forces operating in the economy. On both the tradable and non-tradable side, routine white and blue-collar employment was being reduced by powerful, labor-saving technology, with accelerations in the trend during downturns (see Figure 17). And, second, increasing global integration on the tradable side caused mid to lower value added jobs to move offshore to other parts of the global economy. This, in part, accounts for the rapidly rising value added per person in the tradable sector (see Figure 14). This last pattern is not by itself problematic; this is what is supposed to happen when developing countries engage with the global economy and do so via occupying the lower value added segments of global supply chains. But it went too far in the U.S. case because of the excess domestic consumption and deficient investment.

²¹ For instance, Autor, Dorn, and Hanson (2012) found that regions with high proportions of manufacturing employment experienced outsized decreases in manufacturing's share of employment in response to the influx of Chinese imports. These authors have several additional papers that corroborate this finding.

Figure 17: Log Employment in Routine Occupations, 1967-2011



Source: Jaimovich, N., & Siu, H. E. (2012). *The trend is the cycle: Job polarization and jobless recoveries* (No. w18334). National Bureau of Economic Research.²²

We do not want to be misunderstood here; globalization does not automatically produce defective growth patterns. However, increased integration does create more opportunities for defective growth patterns to develop and the relatively straightforward and largely automatic adjustment mechanisms that are present when an economy is largely closed are not present.

The Post-Crisis Period

The post-crisis period is especially interesting. In order to get a sense for the drivers and drags on the U.S. economy over the recovery period, we ranked changes in employment and value added from 2009 to 2012 to highlight what parts of the economy seem to be pushing and pulling growth and what industries are contributing to these dynamics (see Table 1; see Appendix II for a more detailed version).

²² According to Jaimovich and Siu (2012), “[i]f the tasks involved [for an occupation] can be summarized as a set of specific activities accomplished by following well-defined instructions and procedures, the occupation is considered routine.” For more detail, see Jaimovich and Siu (2012).

Table 1: Summary of Drivers and Drags of the U.S. Recovery (2009-2012)

Change in Employment, 2009 to 2012		Change in Real Value Added, 2009 to 2012	
<u>Gross 09-12 Gain: +6,092 thousand jobs</u>		<u>Gross 09-12 Gain: +1,045 billion 2005 USD</u>	
<i>Gross Gain (in thousands)</i>		<i>Gross Gain (in billions of 2005 USD)</i>	
Non-tradable	+4,260	Non-tradable	+506
Tradable	+1,832	Tradable	+539
<u>Gross 09-12 Loss: -707 thousand jobs</u>		<u>Gross 09-12 Loss: -51 billion 2005 USD</u>	
<i>Gross Loss (in thousands)</i>		<i>Gross Loss (in billions of 2005 USD)</i>	
Non-tradable	-568	Non-tradable	-7
Tradable	-139	Tradable	-44

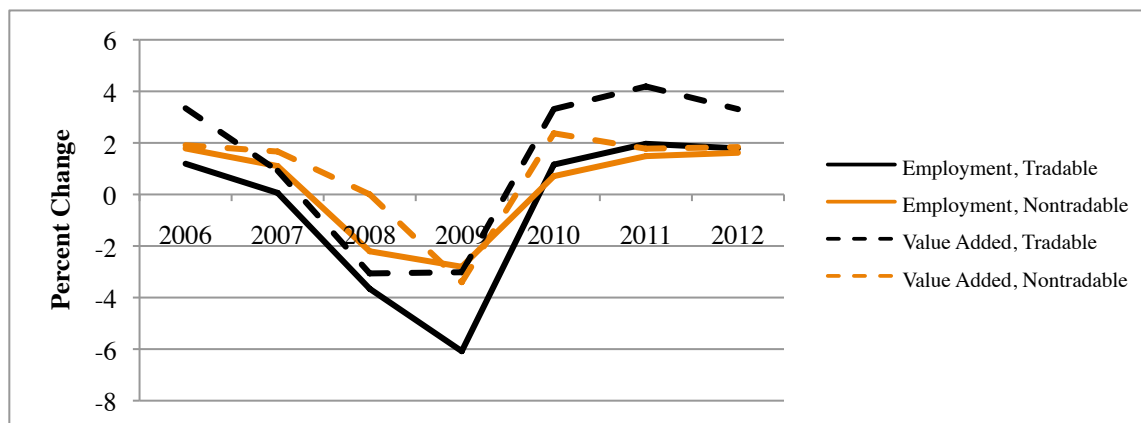
In terms of employment, 70 percent of the gross gain of 6 million jobs from 2009 to 2012 originated in the non-tradable sector, with industries like health care, the hospitality industry (accommodation and food), administrative services, and retail as key drivers. While the tradable sector accounts for a small proportion of gross gain, some growth in professional service and capital-intensive manufacturing III employment is encouraging. Employment losses of 707 thousand jobs were also biased towards the non-tradable sector, with 77 percent of lost employment coming from government. These cuts largely took place at the local level in public education.

On the value added side of the economy, the tradable side of the economy is performing strongly, generating more than half of gross gains since the start of the recovery even though it is only a third of the economy. The tradable value added gains stem from manufacturing III (particularly electronics and auto) and professional services. Drags on the economy's value added growth stem from agriculture and mining, also parts of the tradable sector of the economy. However, these losses are minor (losses of \$51 billion USD) relative to the gross gains (an added \$1 trillion USD) over the 2009 to 2012 period.

Taking a closer look at year on year changes in each component during the crisis and subsequent recovery, we see that the drop in tradable employment was particularly severe (see Figure 18). Also, the tradable side of the economy reacted more negatively in the early phase of the recession, in both value added and employment terms. However, tradable value added quickly rebounded and is now driving the recovery, growing an average of 3.6 percent year on year over the period from 2010 to 2012. Tradable employment, on the other hand, is growing at an average of 1.6 percent year on year from 2010 to 2012, slightly faster than non-tradable employment but off a much smaller base.

Across both sectors, employment is not growing fast enough to regain lost employment from the recession and accommodate the growing labor force—hence the still high unemployment rate.

Figure 18: Employment and Real Value Added Percent Change, Year on Year



The comparatively stronger growth in the tradable sector is the pattern you would predict in a relatively flexible and dynamic economy. Under-utilized labor and capital capacity is moving towards external demand since domestic demand is still in a slump.²⁴ Part of the rising competitiveness at the margin in the tradable sector is muted wage and income growth stemming from labor reallocation towards low-skill non-tradable industries, which in combination with inflation, lowers unit labor costs. Inflation has been muted but the effect is still there. There is also the substantial effect in some sectors of declining energy costs associated with shale gas and oil. Finally, the trend depreciation in the dollar, and resulting increase in export price competitiveness, is also a contributing factor to the tradable sector’s gains (see Figure 16).

Figure 19 and 20 illustrate the 24-quarter patterns in export and imports relative to GDP following several business cycle peaks dating back to the late 1960s.²⁵ The thick black line represents the most recent cycle. With external demand picking up some of the slack, exports are rising and are well above their 2007 levels. Imports dropped and then rose but not much past their 2007 levels yet. Compared to other cycles in the past forty years, imports dropped severely and have been very slow to rebound due to depressed demand and depreciation effects.²⁶ The trade deficit is decreasing.

²⁴ Based on the National Federation of Independent Businesses’ May 2012 survey of small U.S. firms, low sales have been the predominant issue over the recovery period. According to the November 2013 SBET survey, government regulation and taxes have replaced poor sales as front-runners for concerned small business owners more recently.

²⁵ The peak dates come from the NBER Business Cycle Dating Committee.

²⁶ While we recognize that there is incomplete pass thru, there is likely some pressure on import prices.

Figure 19: Exports/GDP, Percent Change from Peak

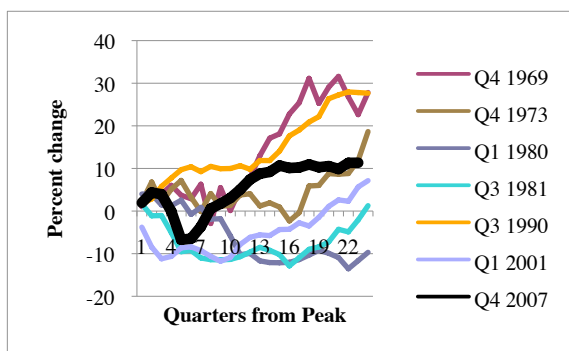
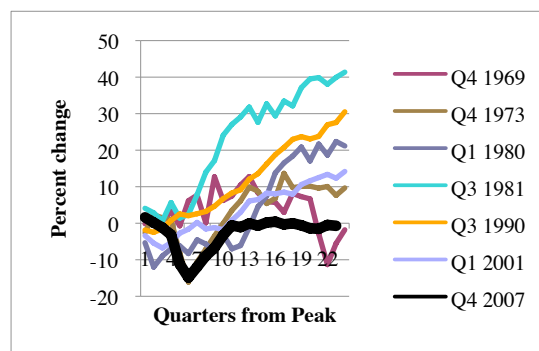


Figure 20: Imports/GDP, Percent Change from Peak



Source: Bureau of Economic Analysis and authors' calculations.

In summary, we are watching a demand-driven supply-side rebalancing process toward the tradable sector and away from the non-tradable side. And because income generated on the tradable side spills over to non-tradable demand, the growth in the tradable side undoubtedly understates its contribution to the partial recovery we are experiencing.

From a longer term perspective, as the tradable sector of the global economy grew, in part because of developing country growth and productive potential, exports and imports have been rising as is evident in Figure 1. Most economies including the U.S. are becoming more trade exposed. But in the U.S. case, beginning in the mid 1990's, imports rose faster than exports. This might have produced a problem of deficient total aggregate demand. But outsized domestic aggregate demand filled the gap until the crisis. Now external demand is rising absolutely and as a fraction of total aggregate demand. The supply side of the economy is shifting structurally toward the tradable side. This takes time, but it is a move toward a more sustainable growth pattern.

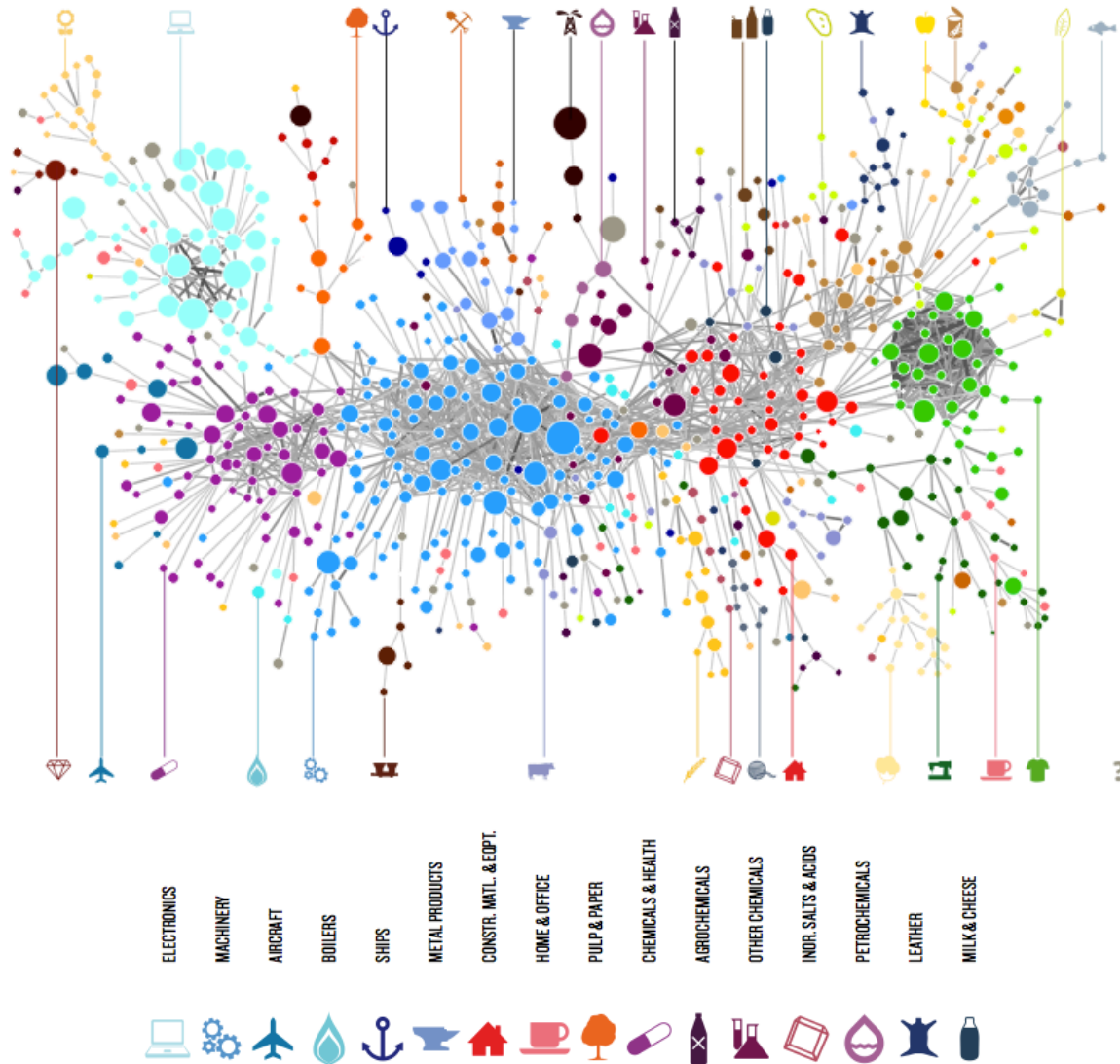
Opportunities & Hurdles for Expansion

Despite the current administration's goal of doubling exports between 2010 and 2014, one might wonder how realistic it is to expect meaningful growth in U.S. exports along either the extensive or intensive margin. Our recent export growth provides evidence that the latter is already occurring with auto, aircraft, electronics, and petroleum products leading the increase.²⁷ However, there is also room for diversification into new export industries. Recent research from Hausmann et al. (2011) shows that there exists "low hanging fruit" in the world of international goods trade. Different sets of "embedded knowledge" capabilities are suited for producing different sets of products. The authors grouped products based on their probability of being co-exported by individual countries, a measure constructed using international trade data from 2006 to 2008. For example, if countries that export televisions also tend to export desktop computers, these two products would be in the same "embedded knowledge" product set. Each product category is marked with a node and the size of each node is based on the product's share

²⁷ Based on US International Trade Commission data, Sept 2013 Update.

of total world trade (see Figure 21). Product spaces in blue and purple are high complexity industries like machinery, computer electronics, and transport equipment (autos, ships, and aircraft). Red products are in the construction materials industry, green products are in the garment industry. As the authors contend, the map is not meant to be a guide for industrial policy; rather, the map is to highlight the “scope of the achievable.”²⁸

Figure 21: Product Space (Hausmann et al. 2011)



²⁸ From the preface of Hausmann et al. (2011).



Source: Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Chung, S., Jimenez, J., Simoes, A., & Yildirim, M. A. (2011). *The Atlas of Economic Complexity: Mapping Paths to Prosperity*. Boston, USA.

Of course, as the world’s largest services exporter and second largest goods exporter, the U.S. is already exporting in most product industries.²⁹ However, there are still substantial diversification opportunities in electronics and machinery (the products in shades of blue). And while Hausmann and his co-authors do not include service trade in their analysis, there are also diversification opportunities in high-skill service sectors as well.

The role of policymakers should be to support the flexibility of the economy and the mobility of resources so that we might take advantage of this “low-hanging fruit.” There is now substantial evidence of large and persistent labor market frictions (in the form of long unemployment spells, lower earnings, and high retraining costs) when workers must shift to a new sector.³⁰ Policies to mitigate these frictions will help the structural adjustment process in terms of speed and quality. Additionally, taking steps to improve foreign market access for services will help support the professional service sector’s continued expansion, under the purview of the WTO or in bilateral trade agreements.

On the negative side, there remain problems, including substantial fiscal drag, the pattern of public sector under-investment has not shifted dramatically yet, and persistently low interest rates may start to push the economy back toward the levered growth pattern with bloated (relative to sustainable potential) non-tradable demand as mentioned above. At the moment that would be a risk rather than a reality, but it is and should be included in the calculation of costs and risks of continued unconventional monetary policy.

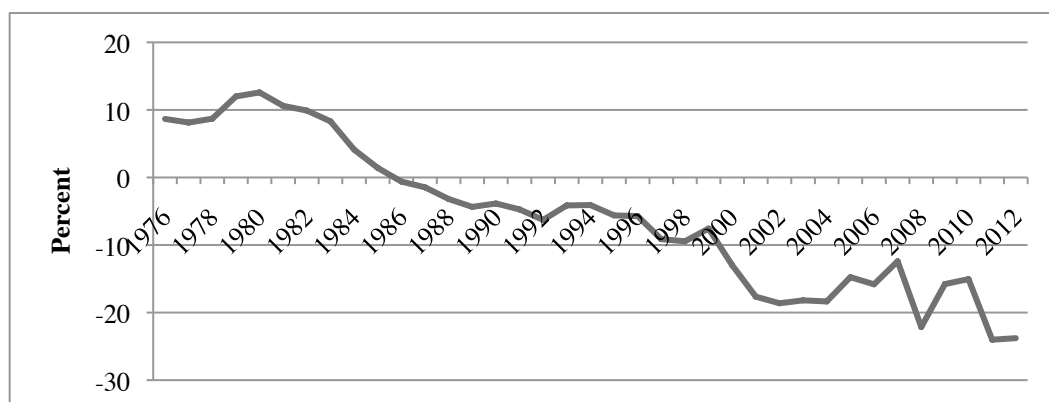
Also of continuing concern is the divergence between drivers of employment versus drivers of value-added. Based on the recovery thus far, rising income differentials between the tradable and non-tradable sectors are not set to slow. Moreover, because the tradable sector tends to be geographically concentrated, inequality between the sectors may translate into increasing geographic inequality, leading to a more reactionary political environment, as unemployment and underemployment become concentrated in certain regions. Thus, while promotion of the tradable sector may get us top-line GDP growth, it may not solve any of the distributional problems that have become particularly conspicuous during the recovery from the Great Recession.

²⁹ Based on the WTO’s 2011 rankings of the world’s top exporters.

³⁰ Examples of supporting literature include Murphy and Topel (1987), Cosar (2010), Fajgelbaum, (2010), and Menezes-Filho and Muendler (2011).

Finally, in this paper we have not focused on the non-trade components of the current account balance: net income on investments and net transfers. Net transfers are elements like remittances and grants to foreign countries, while net income is the difference between receipts and payments on investments. The latter is becoming increasingly important. Payments on foreign-owned U.S. investments dampen the net income component of the current account balance (although it is still positive since the U.S. has a higher rate of return on foreign assets than foreigners have on U.S. assets). Since the level of the current account balance translates into changes in the U.S. net international investment position (NIIP), we can get a sense for how large the dampening effect is becoming over time. The U.S. NIIP to GDP ratio, which has been increasingly negative since 1986, momentarily improved during the recession but has since deteriorated again (see Figure 22).

Figure 22: U.S. Net International Investment/GDP, 1976-2012



Source: Bureau of Economic Analysis

There is little the U.S. can do to intervene given the global savings glut and affinity for U.S. assets (even during the worst of times); thus, it may not be possible to attain a surplus. Nor may we want to attain a surplus. Catherine Mann (2002) notes that a current account deficit can indicate that a country is “living beyond its means” or that it is an “oasis of prosperity.” The U.S. current account deficit in the years leading up to the Great Recession reflected the more worrying of the two conclusions as private saving fell. However, the deficit’s recent contraction moves us closer to a more sustainable level that reflects a strong, safe investment environment.³²

It should also be noted that the dollar’s trend depreciation has induced strong positive valuation effects in recent years, helping offset the negative effects of the large capital inflows. Prior to the crisis, Elwell (2012) found valuation effects in the range of 30 percent for 2006, corroborating Gourinchas and Rey’s earlier findings; for 2007, he estimates valuation effects of nearly 70 percent.

³² Gross, as opposed to net, flows are also of importance due to their potential for inducing balance sheet recessions because of their large size and distorted compositions. For an excellent discussion on these elements, see Obstfeld (2012).

However, even if it were possible to push the current account balance into the black, that does not mean that our difficulties would cease to exist. Recent lessons from Germany and China tell us that relying too heavily on external demand can present its own set of quandaries.

Current Account Surpluses Can Be Problematic Too: The Examples of China and Germany

China

For much of the past 30 years, China's growth was driven by external demand and by very high levels of investment. Household income and consumption as a fraction of total aggregate demand declined and remain abnormally low, even when compared to developing countries at similar income levels. This growth pattern worked well but has reached its limits and requires change. Generating domestic aggregate demand by pushing investment into low return territory at the margin is a defective growth pattern. This is well understood in China. The core of the Chinese reform program on the demand side is targeted at shifting the *composition* of aggregate demand to high return investment (public and private) combined with household income and consumption growth. It is made more urgent by low growth potential in the export sector (though domestic demand for tradables will rise) because of low growth in advanced countries that still account for roughly 50 percent of the global economy and a larger fraction of export demand.

In many ways China is the reverse of the U.S. case. In the Chinese case, aggregate demand needs to shift somewhat away from external demand (not in absolute terms but as a percentage) and low return investment at the margin, toward consumption. This will require a reversal of the downward trend in household income as a fraction of total income.

There are many complementary system reforms (in the financial sector, governance, and fiscal space, including the management of substantial public assets) that are required to steer the economy toward this adjusted growth pattern. There is also a substantial agenda targeted at human capital, rising value added, and structural change on the supply side of the Chinese economy, including augmenting the incentives (via competition) for innovation, and its financing. The state owned enterprises and reserved sectors are at the core of the discussion. Nevertheless, the structural evolution of the economy will, in the end, respond to the level and composition of aggregate demand. Getting the balance right via exchange rate appreciation, shifting who controls income, and how it is deployed between consumption and high return investment is the key. The direction of change is clear. Government, directly or indirectly will need to control less and the market will need to control more.

Germany

Much is made of the German current account surplus, which is large in both percentage and absolute dollar terms. Due to the heterogeneous Eurozone membership, southern countries in the Eurozone have an overvalued currency and Germany has an undervalued one. In Germany, that tends to produce surpluses and, by definition, an excess of savings over investment. It also tends to produce a defective growth model, one with an outsized tradable sector with insufficient domestic aggregate demand. Since the non-tradable sector in advanced economies tends to generate the employment, this pattern can also lead to an employment problem, even if it is partially masked by cutting back hours rather than people.

Leveraging up will not be an attractive option in Germany. However, relaxing the restraints on income and wage growth (an important part of the competitive rebalancing reforms of the 2003-2006 period) does appear to be part of new coalition government's plans. This may have two beneficial effects. One is to elevate domestic demand and the other is to accelerate the convergence of productivity relative to unit labor costs with the southern European countries. Both will tend to bring the current account surplus down, and help create growth potential in the south.

Concluding Thoughts

In an open and increasingly connected global economy, growth patterns are complex and defective ones can be a source of significant macro risk. Thus, identifying defective growth patterns before they fail, sometimes catastrophically, has a reasonably high payoff for investors, businesses and policy makers alike.

The U.S. recovery and restoration of sustainable growth at full potential has three components. One is the restoration of confidence and animal spirits, a normal and well understood part of any cyclical recovery. The second is completion of the multi-year process of deleveraging. And the third, the one we have focused on, is the structural rebalancing of the supply-side toward the tradable sector.

Both the second and the third take time. While there are policies that affect the speed of adjustment, beyond a certain point the process cannot be compressed. As we have tried to show, the third element--the structural rebalancing--is occurring naturally. This is in part due to the flexibility of the U.S. economy and the absence of structural rigidities that plague some of the southern European countries. In the U.S. case, the principle potential impediment to structural rebalancing would be re-leveraging and elevating domestic aggregate demand above a sustainable level with respect to income.

We are not at that point yet. An orderly, credible multi-year deficit reduction plan with a focus on growth enhancing investment combined with a restoration of a normal interest rate environment will allow the movement towards a sustainable growth pattern to proceed. A collaboration among government, business, and the educational sector to

close skills gaps and mismatches would help accelerate the process, as would the continued removal of barriers to trade in goods and especially services.

In terms of tailwinds, a restoration of some growth in Europe would help, but that is probably a few years out into the future. China's growth, rising incomes, and its large market will also create expanded opportunities in the tradable sector. The reduction of the current account surplus in China combined with the declining U.S. current account deficit suggests that some aspects of pre-crisis global imbalances are unwinding.

In the long run, real growth is driven by total factor productivity increases. Our analysis is not meant to detract from that fundamental insight. Our point is that staying in balance structurally is an important aspect of reaping the benefits of TFP growth without taking destructive multi-year detours.

Finally, in advanced countries, employment in the short to medium term and the distribution of income and wealth in the longer term are going to remain economic and social and political challenges. Restoring growth and employment, in part via improving competitiveness at the margin in the tradable sector, may involve reducing unit labor costs. It certainly does in southern Europe. That will not help with the adverse distributional trends we have experienced.

Appendix I: Industry Splits

<i>Percent of Industry</i>	<u>Non-tradable</u>	<u>Tradable</u>
Accommodation and food services	100	0
Administrative and waste services	89.8	10.2
Agriculture, forestry, fishing, and hunting	0	100
Arts, entertainment, recreation	90	10
Construction	100	0
Educational services	98.89	1.11
Finance and insurance	32.05	67.95
Government	90	10
Health care and social assistance	97.8	2.2
Information	34.1	65.9
Manufacturing I	0	100
Manufacturing II	0	100
Manufacturing III	0	100
Mining	0	100
Other services	100	0
Professional Services	39.2	60.8
Real estate and rental and leasing	100	0
Retail trade	85.185	14.815
Transportation and warehousing	0	100
Utilities	40	60
Wholesale trade	100	0

Appendix II: Drivers and Drags of the Post-Crisis Recovery

Change in Employment, 2009 to 2012			Change in Real Value Added, 2009 to 2012		
<u>Gross 09-12 Gain: +6,092 thousand jobs</u>			<u>Gross 09-12 Gain: +1,045 billion 2005 USD</u>		
	<i>Gross Gain (in thousands of jobs)</i>	<i>% of Gross Gain</i>		<i>Gross Gain (in billions of 2005 USD)</i>	<i>% of Gross Gain</i>
Non-tradable	+4,260	70%	Non-tradable	+506	48%
Tradable	+1,832	30%	Tradable	+539	52%
<i>By industry:</i>			<i>By industry:</i>		
Health care and social assistance	Non-tradable	15%	Manufacturing III	Tradable	24%
Accommodation and food services	Non-tradable	14%	Professional services	Tradable	9%
Administrative and waste services	Non-tradable	14%	Wholesale trade	Non-tradable	7%
Retail trade	Non-tradable	9%	Retail trade	Non-tradable	7%
Manufacturing III	Tradable	9%	Real estate and rental and leasing	Non-tradable	7%
Professional Services	Tradable	7%	Professional services	Non-tradable	6%
<u>Gross 09-12 Loss: -707 thousand jobs</u>			<u>Gross 09-12 Loss: -51 billion 2005 USD</u>		
	<i>Gross Loss (in thousands)</i>	<i>% of Gross Loss</i>		<i>Gross Loss (in billions of 2005 USD)</i>	<i>% of Gross Loss</i>
Non-tradable	-568	80%	Non- tradable	-7	14%
Tradable	-139	20%	Tradable	-44	86%
<i>By industry:</i>			<i>By industry:</i>		
Government	Non-tradable	77%	Agriculture	Tradable	55%
Government	Tradable	9%	Mining	Tradable	29%
Information	Tradable	6%	Government	Non-tradable	13%
Information	Non-tradable	3%	Educational services	Non-tradable	1%
Manufacturing II	Tradable	5%	Government	Tradable	1%

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