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### **The Relation Between Budget Deficits and Growth: Complicated but Clear**

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## **ABSTRACT**

This paper looks at the relationship between government budget deficits and the growth rate of GDP. While orthodox economic theory offers several reasons to believe that growing deficits might be associated with slower growth, and would ultimately be unsustainable, Keynesians assert that deficits could stimulate growth—at least in the short run—implying the relation between deficits and growth could be positive. Modern Money Theory, adopting Godley’s sectoral balance approach, Lerner’s functional finance approach, and Minsky’s theory of financial instability takes a more nuanced approach. Historical data for a number of countries is presented, showing that there is no obvious relation between the deficit ratio and economic growth over long time periods. However, there is a predictable path of the relationship over the course of the business cycle for all countries examined.

**KEY WORDS:** government budget deficit; deficit ratio; GDP growth rate; MMT; sectoral balance; functional finance; Wray curve; automatic stabilizer; Godley; Lerner

**JEL CODES:** B22, B25, B52, E12, E32, E62, F43, H62, H63

## INTRODUCTION

In all versions of orthodoxy, government budget deficits and debt are generally considered to be problematic. While most orthodox economists will admit that occasional and temporary deficits could be beneficial, persistent deficits are evidence that policy is on the wrong track. Deficits that are large enough to cause the debt-to-GDP ratio to rise on trend are particularly dangerous.

Orthodox theory begins with a government budget constraint derived from the application of consumer theory to government. Just like the household, government's spending should largely be financed out of its income. In the case of government, tax revenue is the source of income, although government could also own real and financial assets that produce rent and interest income, respectively. Households can also use debt to finance income, which is seen as a way to smooth consumption overtime—drawing on future income to finance consumption today. The government's analogue is borrowing through bond sales. Borrowing commits the household and government to interest payments. While the household's time horizon is limited, the government's horizon is longer and perhaps unlimited. The household must service debt and eventually retire it; government needs only to service the debt (although politicians often proclaim that government must pay it all back). The sustainability condition for government, then, is roughly that the interest rate paid on debt must be lower than the growth rate of government's income, which can be related to the growth of national GDP since national income can be taxed to service the debt.

Even if the interest rate on government's debt is below the current growth rate of the economy, this may not be sustainable because of the negative impact of debt on the growth rate and/or on the interest rate. According to the Ricardian Equivalents argument, taxpayers will increase saving as they realize that tax rates will go up to service (or repay) the debt. This could slow growth: as government's borrowing absorbs more private saving (households buy government debt rather than financing private investment), growth slows. Since government's spending is biased toward consumption (i.e., transfers and defense spending), productive capacity grows more slowly as saving finances government rather than private investment. Hence, government

deficits and debt slow growth and make it more likely that the interest rate on government debt will be greater than the growth rate of GDP.

Government deficits will also tend to push interest rates up. Competition between government and private investment for a limited amount of finance pushes up borrowing rates. Again, this crowds out investment and slows growth, while increasing the interest rate paid by government. In the ISLM model, the government's deficit pushes the IS curve out and the interest rate up as rising money demand faces a fixed money supply curve.

Unlike the household, government has another source of finance: money printing. This could alleviate crowding-out and pressure on the interest rate. However, increasing the money supply will cause prices to rise and, as inflation increases, interest rates also rise through the Fisher expectations effect (expected inflation is added to the real rate, boosting nominal rates). Since government's spending is not constrained by profit considerations, it can outbid private firms for resources, causing accelerating inflation. At the extreme, government's money printing causes hyperinflation as it chases rising prices.

Finally, as deficits and debt ratios rise, government finds it increasingly difficult to borrow. Bond vigilantes demand ever-higher interest rates to compensate for rising risk that government will simply default on its debt.

To sum up, according to orthodoxy, chronic and rising deficits should be associated with slower growth, rising debt ratios, rising interest rates, and higher inflation.

On the other hand, Keynesian-leaning economists recognize that, in conditions of insufficient aggregate demand, a budget deficit can increase demand and growth. With private spending depressed, government spending could even "crowd-in" private investment. Still, the beneficial impacts of budget deficits are presumably limited as the deficits push the economy toward capacity. Beyond that, many of the dangers highlighted by orthodoxy return.

**Modern Money Theory, Functional Finance, and Sectoral Balances**

Modern Money Theory (MMT) offers an alternative view based on its understanding of government finance, informed by the *state theory of money* and also by Abba Lerner's *functional finance approach* and Wynne Godley's *sectoral balances approach*. Here we will just very quickly summarize the conclusions of MMT regarding impacts of deficits and debt on interest rates and growth and as well on the sustainability of deficits.<sup>1</sup>

According to MMT, government finance is nothing like household or business finance. The so-called budget constraint (with spending financed by income and borrowing) does not apply to sovereign government, but is instead an *ex-post* accounting identity: at the end of the accounting period it will be true that government spending is equal to the sum of tax revenue, bonds sold, and bank reserves created ("money printing") over the period. It is neither a constraint nor does it tell us "how government financed its spending" over the period. All government spending takes the same form: when treasury spends, the central bank credits the reserves of the recipient's bank, and that bank credits the deposit account of the recipient. Tax payments reverse that. Bond sales are not really a borrowing operation, but instead are offered as a higher interest-earning alternative to bank reserves. Since profit-seeking banks will generally prefer bonds over reserves and because bonds are initially placed with dealer banks that must (in the case of the US) place bids, there are no bond vigilantes to refuse to purchase them.

Modern central banks operate with overnight interest rate targets, so they use open market operations to maintain a corridor within which the market rate fluctuates around the target rate (in the USA, the fed funds rate fluctuates between the rate paid by the Fed on reserves and the discount rate at which it lends reserves). Central banks can also operate across the term structure, engaging in open market operations to buy and sell bonds (either outright purchases and sales, or by using repos and reverse repos). Finally, the treasury can work with the dealer banks to ensure that the term structure of the bonds it offers is consistent with market preferences. This means that even though central banks generally focus only on the overnight interest rate directly, rates across the term structure of treasury debt can be managed.

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<sup>1</sup> For a detailed summary of MMT's approach see Wray, L. Randall 2024. *Modern Money Theory: A primer on macroeconomics for sovereign monetary systems*, Palgrave Macmillan New York.

For these reasons, MMT rejects the argument that higher government deficits and debt ratios should be associated with higher interest rates. MMT also rejects the crowding-out arguments because there is no competition for loanable funds nor for a fixed money supply. The short-term interest rate is set by the central bank, not by either the intersection of the demand and supply of loanable funds nor by the demand for a fixed money supply. The private supply of bank money is *endogenously* determined—not fixed by the central bank—and normally increases to meet the demand. While government spending could lead to *real* crowding out—by moving real resources out of the private sector and into the public sector—it cannot lead to *financial* crowding out.

Indeed, government deficits increase both nongovernment-sector saving (“loanable funds”) and bank reserves (“money supply”). The first follows from Keynes’s saving equation (at the aggregate level, saving equals the sum of investment, the government’s deficit, and net exports) and the second follows from understanding that government spending puts reserves into banks and taxes take them out. Hence, net spending leads to a net injection of reserves. The functional purpose of bond sales is not to allow the government to spend but to substitute higher interest-earning bonds for reserves. Since banks voluntarily exchange reserves for bonds, there is no pressure on rates unless the treasury is offering maturities that banks do not want.

Competition over real resources could cause inflation, although outside major war, direct spending by government is not likely to impart much inflationary pressure in the rich developed nations unless government’s purchases are of output with large relative importance in price indices. In the US, high inflation typically comes from fossil fuel–related, food, and shelter components. Much of government’s spending is on transfers and healthcare (including drugs), which *could* (mostly indirectly) fuel inflation pressure. Much of this spending is relatively stable, although some is countercyclical—which should reduce the inflationary impact. Only in exceptional cases—such as COVID-relief spending—has transfer spending increased quickly enough to fuel inflation in the developed countries.<sup>2</sup> Finally, government purchases can

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<sup>2</sup> For an examination of the causes of inflation associated with the COVID recession and recovery see Yeva Nersisyan and L. Randall Wray, “What’s Causing Accelerating Inflation: Pandemic or Policy Response?” Working Paper No. 1003 | March 2022 <https://www.levyinstitute.org/publications/whats-causing-accelerating-inflation-pandemic-or-policy-response>

indirectly cause inflation through the wage channel, for example by causing wages to rise in the most advanced sectors (such as defense) that use skilled and unionized labor. This may have been a problem in the late 1960s, but with declining union power in the US it probably was not a problem in the three decades before COVID.

Indeed, the evidence for the past 30 years in the US and Japan (especially) has been that persistently high deficits and rising debt ratios have been associated with low and relatively stable inflation and interest rates. When interest rates have risen, this was clearly in response to central bank policy to raise them—policy that was well-telegraphed and widely discussed. The exception, again, was the COVID inflation—which led to a highly unusual disruption of the supply side of the economy and an unprecedentedly large infusion of government transfer payments. (We will examine some of this evidence below.)

Lerner’s functional finance approach argues that policy should be formulated to achieve the public purpose, without regard to the impact it might have on the government’s budget. At the aggregate level, the proper budget balance is that which is consistent with full employment. To be sure, that is too simplistic because it ignores the fact that it matters where government spending is directed. There is no unique level of effective demand that would provide full employment. Some types of government spending are inherently more inflationary than others. MMT has always supported targeted spending to achieve full employment while minimizing inflationary pressures—with the Job Guarantee being the main policy proposal.<sup>3</sup> Furthermore, government spending should also take account of social and environmental sustainability: policy should aim to reduce inequality, avoid financial instability, and improve environmental outcomes. But Lerner’s recommendation remains useful: government should try to use its budget to achieve those goals without regard to the budgetary outcome—whether a surplus, a balance, or a deficit is generated.

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<sup>3</sup> For a relief proposal consistent with MMT see Yeva Nersisyan and L. Randall Wray, ONE-PAGER NO. 62 | March 2020 The Economic Response to the Coronavirus Pandemic, [https://www.levyinstitute.org/pubs/op\\_62.pdf](https://www.levyinstitute.org/pubs/op_62.pdf)

MMT also adopts the sectoral balance approach of Wynne Godley.<sup>4</sup> At the aggregate level, national income equals national expenditure. While any one sector can run a deficit, by identity that must mean that at least one other sector runs a surplus. We will look at sectoral balances below. But the important point to recognize is that Godley's sectoral balance approach implies the government's budgetary outcome is not independently determined—indeed, it is not discretionary. To the extent that the nongovernment sector(s) has (have) discretion, it means the government does not. If we look at the budgeting process, we see that much of government spending is determined by economic performance and other factors not directly under government's control—unemployment compensation and various kinds of welfare spending depend on economic performance, while spending on old-aged security, education, and medical support depend on demographics. Likewise, tax revenue is tied closely to economic performance—so while tax rates can be changed, it is more difficult to target revenue.

Together, the functional finance and sectoral balances approaches imply that the goal of policy should be to balance the economy not the government's budget. For our purposes, the implication is that the budgetary outcome is largely endogenously determined with a complex relationship to economic growth rates.

We will turn to evidence on the relationship between deficit ratios and growth rates in the following sections. We begin by summarizing previous work on Japan and the US and then will expand the analysis to a number of other countries, trying to identify commonalities and drawing conclusions that contrast sharply to conventional wisdom.

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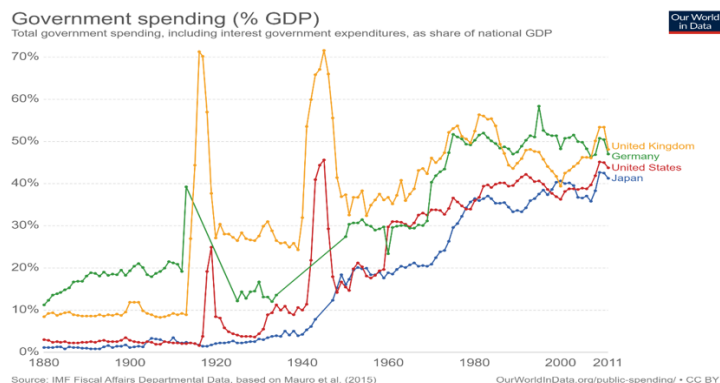
<sup>4</sup> For an application of Godley's sectoral balances approach, see Wynne Godley, "Seven Unsustainable Processes Medium-term Prospects and Policies for the United States and the World" Levy Economics Institute, Strategic Analysis, January 1999, <https://www.levyinstitute.org/publications/seven-unsustainable-processes>



## THE JAPANESE ENIGMA<sup>5</sup>

After decades of rapid growth, Japan became stuck in a low-growth, low-inflation rut. Even with zero interest rates and large and rising deficits and debt ratios, Japan could not restore growth or get its inflation *up* to its target. For three decades, Japan’s experience has defied conventional wisdom—as its debt ratio climbed to what is *probably* a global record (historical data before 1900 may not be accurate, and even more recent data from Greece and Italy might be tainted by creative accounting) but this did not drive interest rates or inflation up. It is true that growth has been sluggish over the period—which would be expected by those who adopt the crowding-out theory (although interest rates should have risen). However, this could be a case of reverse causation: since Japan is rapidly aging, social spending might rise faster than private sector spending, and hence, faster than GDP. Slow growth, in turn, means that, at given tax rates, tax revenue grows slowly, so that the big deficits are caused by slow growth (rather than deficits causing slow growth).

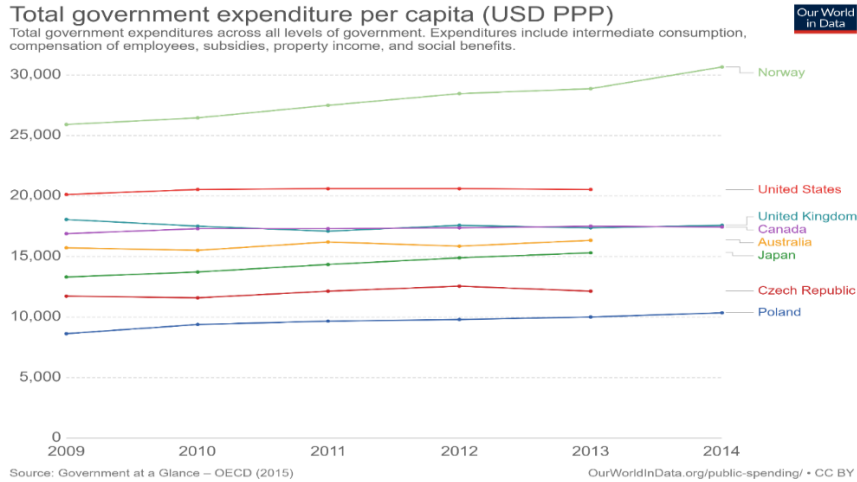
Let’s look at the data. As a percent of GDP, Japanese government spending had risen considerably, as it approached the ratios in the US, UK, and Germany.



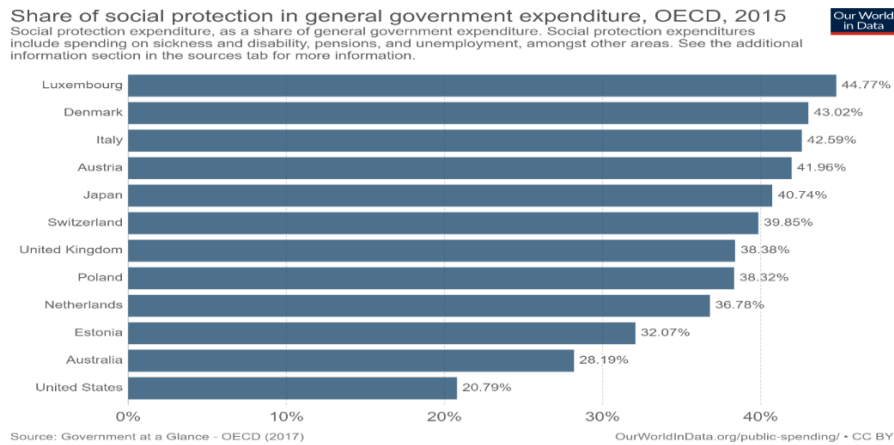
While there *was* rapid growth of the ratio in the 1970s, it has been relatively moderate in the 1990s and 2000s (and it even fell in the Global Financial Crisis). Still, Japan remains relatively

<sup>5</sup> The discussion in this section generally follows the exposition in L. Randall Wray (2019): “MMT and Two Paths to Big Deficits”, *Challenge*, DOI: 10.1080/05775132.2019.1668646

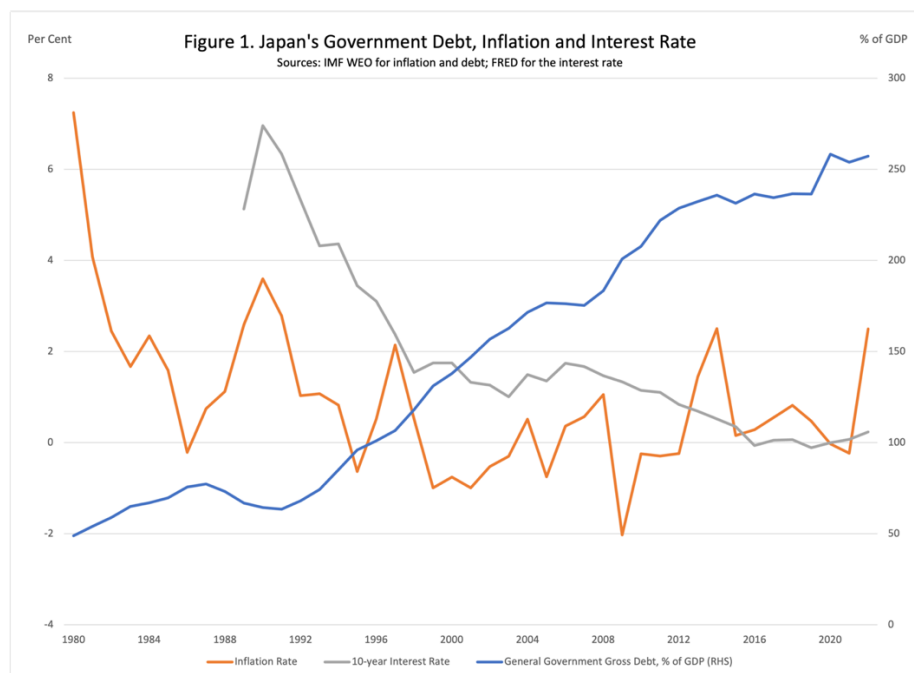
frugal compared to other rich nations when it comes to government spending per capita, as the next chart shows.



If we look at spending for social protection as a share of government spending (which accounts for a large part of government spending in all the wealthy nations), Japan is in the middle of the pack. The US (along with Australia) is an outlier—its population is relatively younger than most (it receives a lot of young immigrants) and it spends far more on defense. Japan and Italy, of course, are far along the demographic march to an aged population, so we’d expect more spending on old-age security.



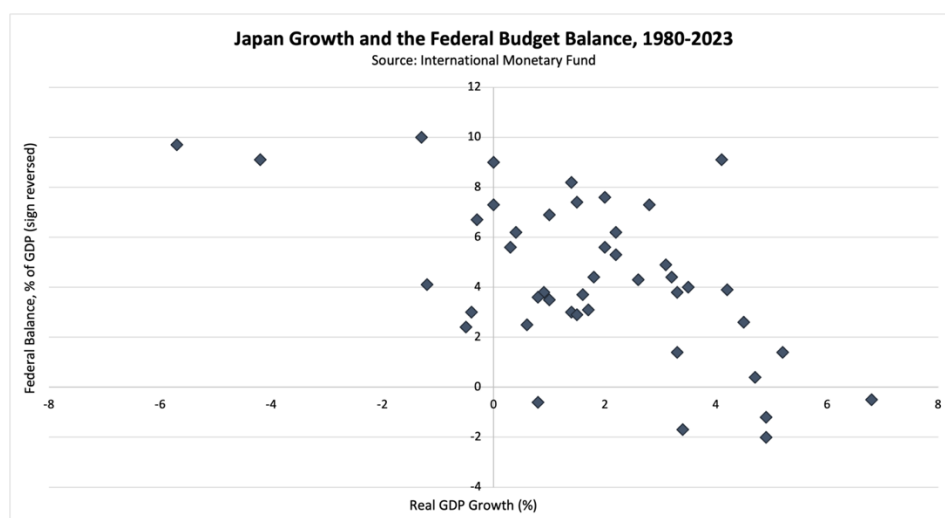
As the following figure shows, Japan's debt ratio has risen to 250 percent although the interest rate on bonds fell to zero, and inflation remained constrained.



The orthodox prescription for Japan's dilemma would be to increase taxes because the problem appears to be that it taxes too little. And this has been the typical response of the Japanese government: to raise consumption taxes to reduce the deficit. For example, in spite of substandard growth, the government passed consumption tax hikes in 1997, 2014, and 2019 (which brought the rate to 10 percent) in failed attempts to close the deficit and slow growth of the debt ratio. What they do not understand is that there are two ways to produce a high deficit (and debt) ratio: the ugly way and the good way. In the next section we present a way to think about this, and then apply it to the Japanese case. In the subsequent section we look at the case of the US.

## THE WRAY CURVE: GOOD AND UGLY JAPANESE DEFICITS<sup>6</sup>

As we've seen, orthodox economists would expect that a rising deficit ratio should be associated with slower growth, while Keynesians would expect that (temporary) rising deficits should add stimulus to demand, and thus produce a higher growth rate. To settle the debate, we might simply plot the deficit ratio against the growth rate, as in the following figure using Japanese data.

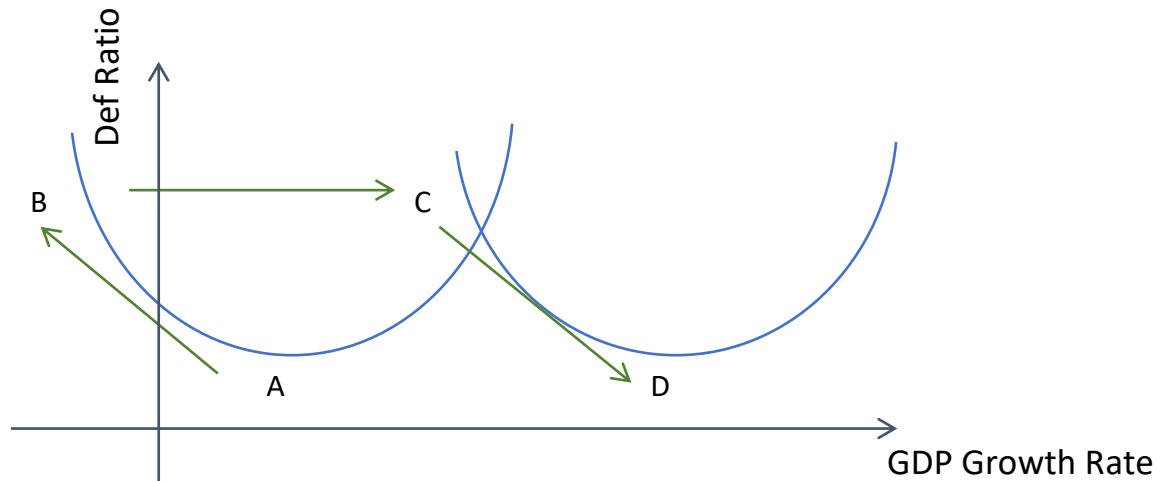


It appears that any given deficit ratio can be associated with a variety of growth rates; conversely, any given growth rate is associated with a variety of deficit ratios. There is no obvious correlation between growth rates and deficit ratios (although there seems to be a negative bias—a point we will return to later) because there are two ways to increase the budget deficit. Let's use a simple graph—the Wray Curve—to demonstrate the proposition.

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<sup>6</sup> The following discussion follows that of L. Randall Wray & Yeva Nersisyan (2021): "Does the national debt matter?" *The Japanese Political Economy*, DOI: 10.1080/2329194X.2020.1867586.

**Figure: The “Wray Curve”**



Begin at point A, with moderate growth and a low deficit ratio. The “ugly” way to produce a higher deficit ratio is to go into a recession, which lowers tax revenue as GDP growth turns negative. We move toward point B. The “good” way to get to a higher deficit ratio, i.e., to point C, would be to engage in proactive and adequately sized stimulus spending, such as spending on public works, infrastructure and direct job creation. A measured and targeted stimulus would lead to rising household and firm incomes, that would eventually boost optimism enough to increase private discretionary spending. We would expect the deficit to increase and the growth rate to rise.

However, at point C, the faster growth will increase tax revenue, reducing the deficit ratio as the deficit adds demand to the economy. We could move toward point D. As the deficit ratio declines and moves toward a surplus, taxes take demand out of the economy. It is possible that the drag would slow growth—perhaps moving toward point A—that then restores a bigger deficit if the downturn is deep enough. We can get another ugly deficit, moving back to point B. Each point is temporary because of the dynamics created by movement of the government’s budget.

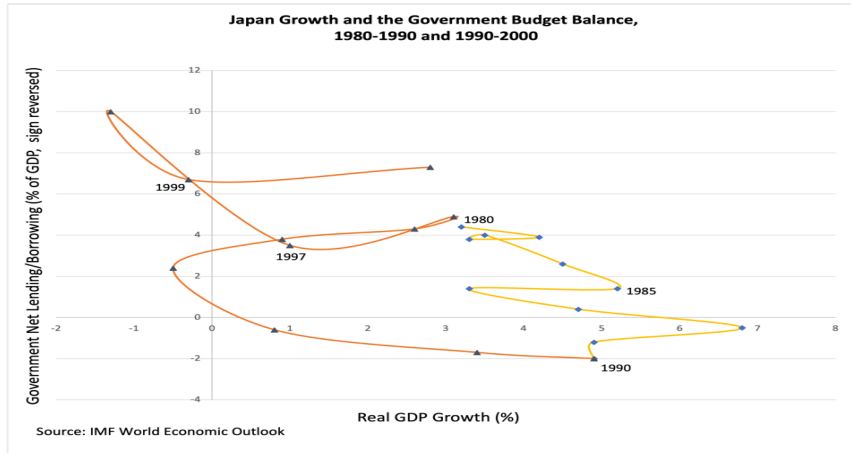
The dynamics could be changed in the case of Japan by ramping up the old-aged security safety net (that is relatively weak), as well as making a commitment to the provision of secure jobs and decent pay to encourage households and firms to spend. What is important is that the deficit is self-limiting as growth leads to higher tax revenues (due to rising incomes) shifting the economy from Point A to Point D (as the curve shifts to a higher growth rate) with lower deficits and higher growth.

As we will see, nations typically move in a predictable cyclical manner from moderate growth and a lower deficit ratio, A, to much lower growth with a higher deficit ratio, B, and on to a lower deficit and faster growth. The lower deficit then moderates growth, with slower growth resulting in higher deficits—with this process repeating itself over and over again. This could be due to a combination of automatic stabilizers and discretionary fiscal policy. Policymakers accept bigger deficits in recession but once recovery begins, they add to the automatic damper of rising tax revenues by pursuit of measures to cut deficits (i.e., spending constraints or new taxes). The deficit does fall with faster economic growth but that creates headwinds that push the economy toward another downturn.

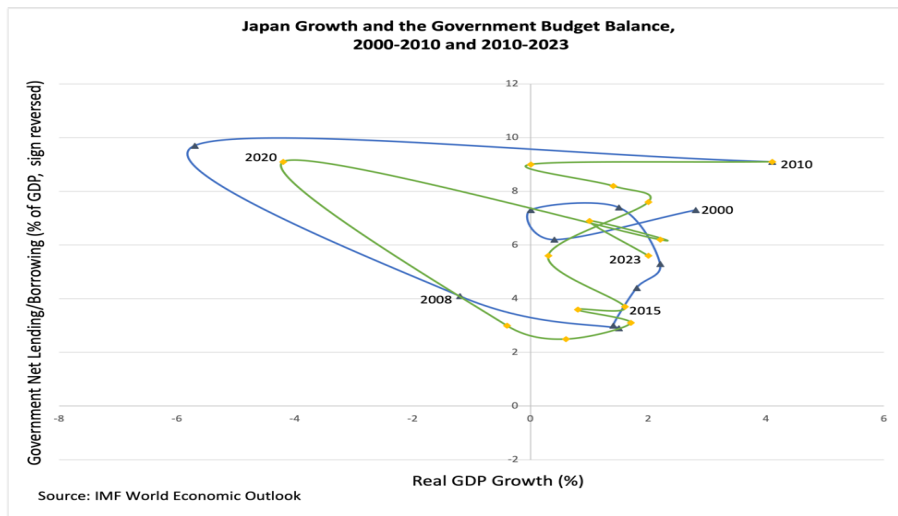
In sum, we propose that there are two different growth rates consistent with a given deficit ratio. A nation can achieve a particular growth rate either the “ugly” way or the “good” way. We hypothesize that Japan continually operates its economy to produce “ugly” deficits—in part because it fears excessive deficits and debt. Let’s look at the data in detail.

In the following graph, the yellow line traces the relationship between the government balance and economic growth over the period 1980–90. Over this period, growth trended upward, from about a 3 percent pace to a range of 5–6 percent over the course of the 1980s, while the budget moved from a relatively high 4.5 percent of GDP toward balance and then a surplus in the final three years of the decade. The orange line shows the period 1990–2000. Early in the decade, growth plummeted, while the budget surplus fell and then turned into a deficit. Over the rest of the decade, both growth and the deficit ratio experienced wild swings—each with a period of slowing growth associated with sharply rising deficit ratios, helping to restore growth that lowered the deficit ratio. Note that, despite the aforementioned consumption tax hikes, the general trend for the deficit ratio was upward: it took a bigger “ugly” deficit to restore growth

over the course of the decade. And none of the peak growth rates approached the pre-1990s performance.



The following graph shows the period 2000–2010 in blue. The first half of the decade shows a tendency for the deficit ratio and the growth rate to fall together, while the second half saw a deep recession as the Global Financial Crisis impacted the economy and caused a large increase in the deficit ratio. The economy recovered moderate growth in 2010 with a high deficit ratio. The green line shows the relationship between 2010 and 2023. Over that period, the economy cycles between a growth rate of 1 to 2 percent, with the deficit ratio falling from 9 to about 2 percent before the COVID crisis. By 2020, Japan was back in a deep recession with a deficit ratio again approaching 10 percent. With recovery from the pandemic’s recession, Japan resumed slow growth, and the deficit ratio fell to about 6 percent.



To sum up, what we generally find in the case of Japan is that high growth rates in the 1980s reduced the deficit ratio and even produced a budget surplus, which eventually reduced economic growth. After that, the high growth rates of the 1980s were never approached again. Whenever growth fell, the deficit ratio would rise, generally helping growth recover, albeit to low levels, which tended to reduce the deficit ratio—only to be followed by yet another downturn. When growth was sufficiently negative, recovery would lower the deficit ratio. Yet growth was never sufficiently robust to eliminate the deficit. Overall, the deficit ratio was sufficiently higher than the growth rate to increase the debt-to-GDP ratio five-fold, from 50 to 250 percent. As we saw above, government spending was growing relative to GDP, but it only increased from about 35 to less than 45 percent over the same period—less than 10 percentage points.

Returning to Lerner’s functional finance approach, Japan’s attempt to reduce deficits by increasing the consumption tax was wrong-headed and should have been done only if Japanese consumption was too high—for example, if it was causing domestic inflation. However, as we have seen, the inflation rate has been low, and even stubbornly below the central bank’s target. Further, Japanese private saving rates are high—among the highest in the world. Given sluggish growth, low inflation, and a high propensity to save, government should have reduced consumption taxes to encourage more spending. We will have more to say about Japanese saving rates below when we turn to Godley’s sectoral balance approach, which helps to put Japan’s high saving in another light.

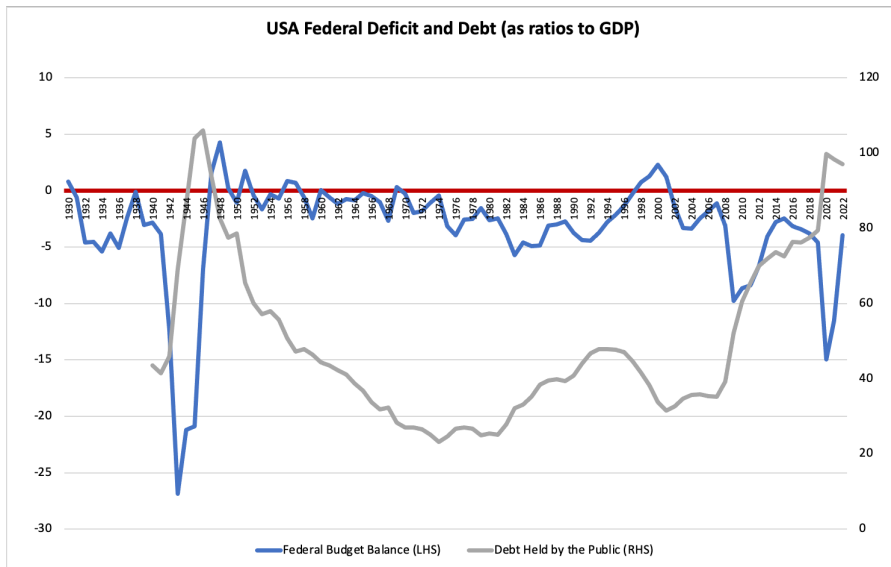
## **THE CASE OF THE USA**

As we saw in the three graphs above, the US has a relatively small government sector, approximately the same size as that of Japan. US per capita government spending is only mid-range for the developed nations, in spite of very high per capita GDP. Finally, with its relatively young demographic composition (for a rich nation), its social safety net is not generous. Still, like Japan, its debt ratio has been growing significantly, and except for the Clinton years, it has



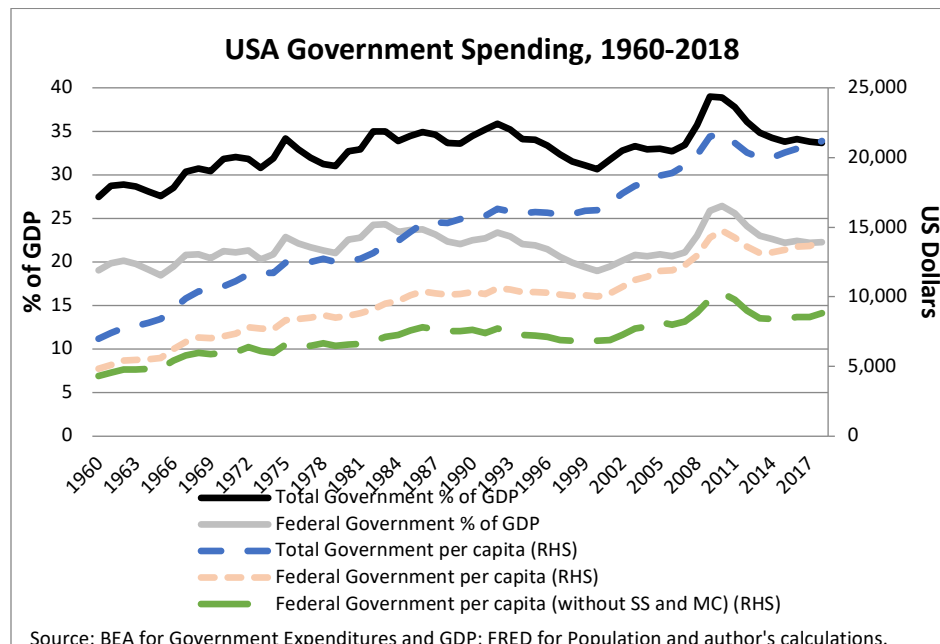
had a persistent budget deficit. Before turning to a Wray Curve for the US, let's add a few more points related to US's budget deficits.

The following graphs show the trends for the federal government's budget deficit and debt ratio (*publicly held debt*, which excludes debt held by the government itself in trust funds, such as that of the Social Security program). In the postwar period, the only two periods with significant budget surpluses occurred with the de-militarization immediately after WWII and during the Clinton administration at the end of the 1990s. Otherwise, deficits are the normal outcome. Second, the debt ratio declined continually in the postwar period, not because of budget surpluses but because GDP grew faster than debt. That was reversed in the 1970s, as debt generally grew faster than GDP—especially with the end of the Clinton surpluses, as it has grown to nearly 100 percent.



The following graph shows various ways to look at US government spending, both total spending (all levels of government) and federal spending only—as a percent of GDP and per capita. Total government spending relative to GDP grew by only about 5 percent over the period, with federal spending increasing about 3 percent. Except for a temporary bump upward after 2008, most of the growth had occurred before 1970—largely reflecting spending related to the baby boom (spending on births, schools, and suburbs). On a per capita basis, total government

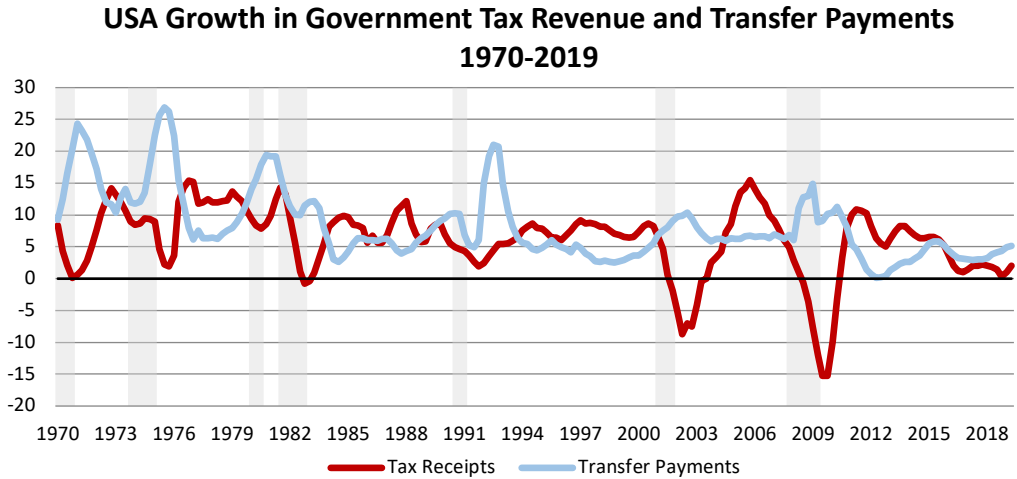
spending quadrupled over the period—at a pace just above growth of living standards as reflected by GDP growth. What is surprising is how slowly per capita federal spending grew when we leave out Social Security and medical care—just \$3000 over the entire period. That means most of the growth of federal government spending per capita was mandated by law, increasing spending on Social Security, Medicare, and Medicaid. Very little of the growth of federal government spending was discretionary.



The following graph highlights the cyclical nature of tax revenues and transfer spending—with taxes highly pro-cyclical and transfers counter-cyclical. Note that transfers rise significantly after recessions (shaded grey), but the swings become smaller over time. The automatic spending stabilization effect of transfer spending has gone down; not surprisingly, recoveries (up to the COVID recovery) have been called “jobless” since President Bush, Sr.’s recession in the early 1990s. And as Tcherneva<sup>7</sup> has shown, they became more jobless since, with recovery of jobs lost in recession taking longer with each recession. On the other hand, taxes have become more pro-cyclical, with revenues falling off a cliff in recession and rising sharply in expansion. Their automatic stabilizing function has become more important than transfers—something that is often overlooked. While tax revenues have always grown more slowly in recessions, since 2000

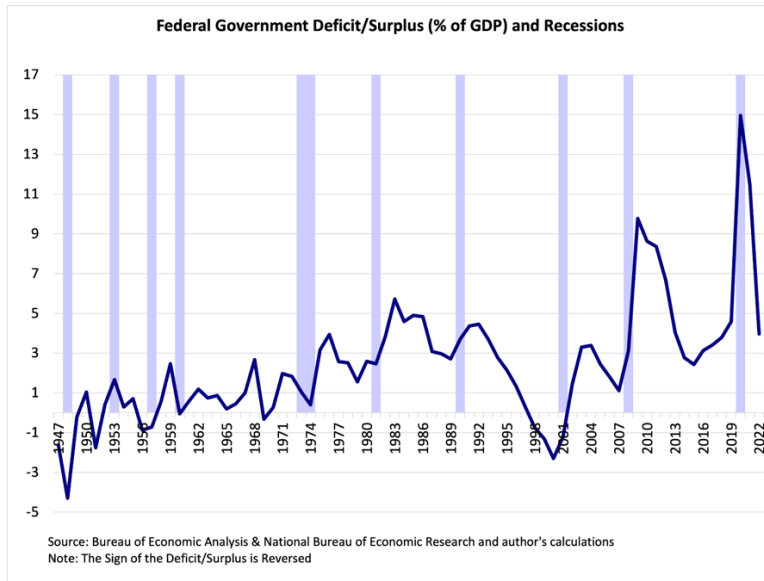
<sup>7</sup> [https://www.levyinstitute.org/pubs/pn\\_17\\_1.pdf](https://www.levyinstitute.org/pubs/pn_17_1.pdf)

they actually fall in absolute terms. What this means for the Wray Curve will be examined below: large “ugly” deficits are produced when growth slows.



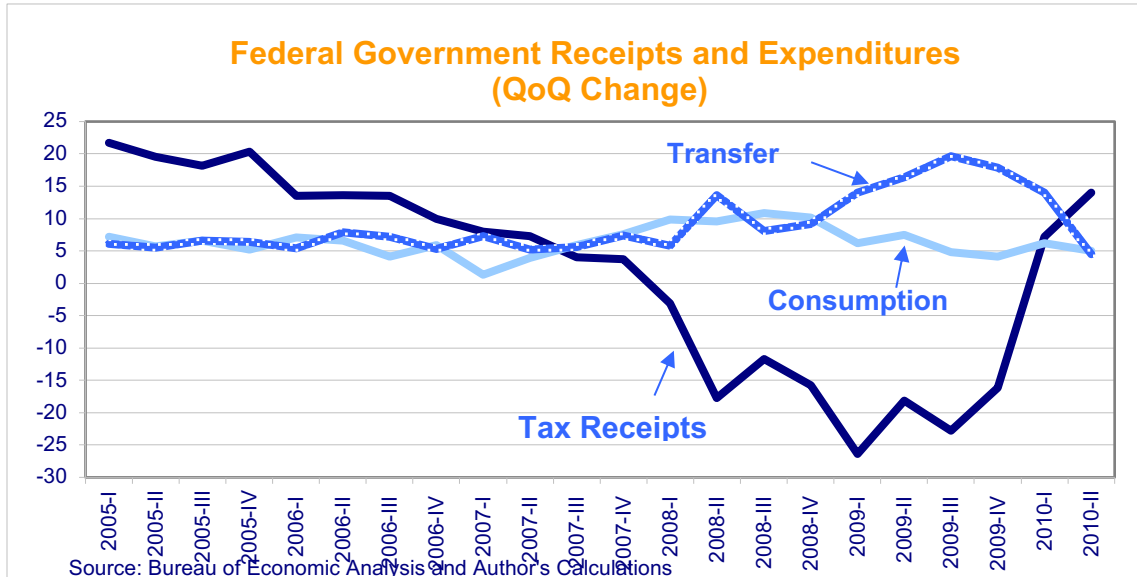
Source: BEA and author's calculations. Note: growth is measured over the same quarter of two years. Data has been smoothed using a moving average.

The following figure shows how the budget always tightens (the deficit falls) right before recession, and then quickly and sharply turns toward bigger deficits in recession.

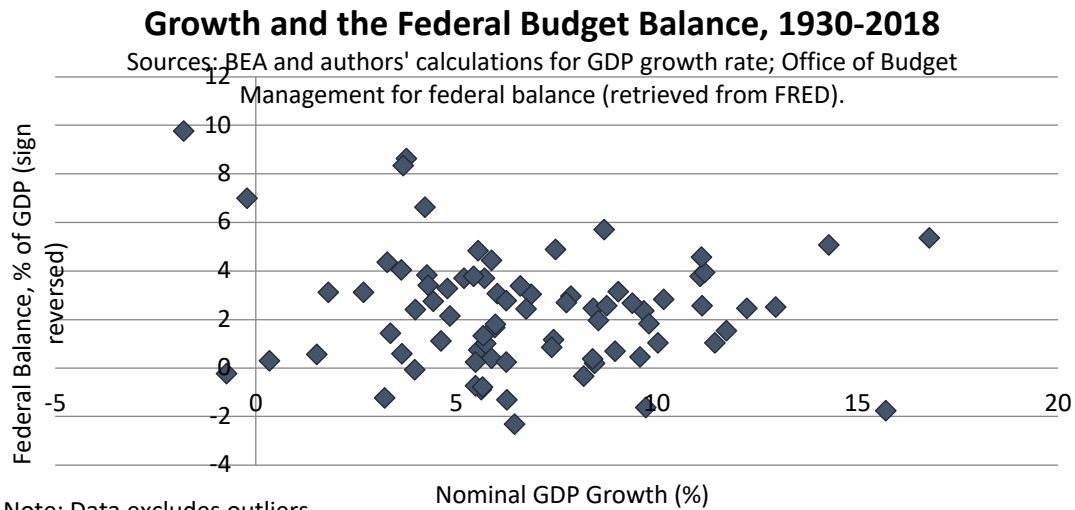


Looking in particular at the GFC’s recession (next figure), we see that most of the expansion of the deficit was indeed due to the collapse of tax revenue. Federal government revenues declined

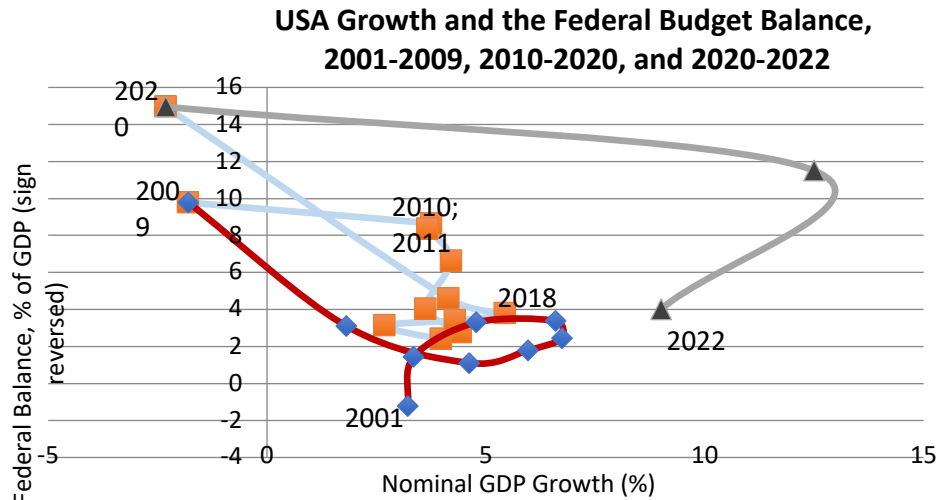
sharply as the economy slowed; consumption-type spending at first rose slightly (probably reflecting the small two-year relief package), and transfer payments gradually rose as the recession deepened. But most of the swing of the budget to a huge deficit was due to lost tax revenues.



Turning to the Wray Curve for the US, we first look at a scatterplot showing combinations of growth rates and deficit ratios. As we now expect, given the argument above, there is no obvious relationship between the two. At moderate deficit ratios (2–4 percent) we observe a very wide range of growth rates.



When we trace the path of the relationship over the decades, we find patterns similar to those we found for Japan. The appendix shows additional years, but let’s focus on the two decades 2001–09 and 2010–20 plus the post-COVID period.



Sources: BEA and authors' calculations for GDP growth rate; Office of Budget

We begin with recovery from the relatively short Dot.com recession, the last year of the Clinton surplus in 2001. The deficit ratio grows in a “good” way to about 4 percent, with growth accelerating to about 7 percent in the bubble economy before the GFC collapse. As the recession worsens, growth goes negative after 2008 and the deficit ratio climbs to 10 percent—an “ugly deficit” largely due to loss of tax revenue, although there was a fiscal stimulus package of about \$800 billion spread over two years. The economy began recovery in 2010, with growth rising to nearly 4 percent, and remaining at approximately that pace for much of the next decade (peaking at nearly 5.5 percent in 2018). The faster growth saw the deficit ratio fall as low as 2 percent. However, the COVID recession caused GDP to fall at nearly a 2.5 percent pace while the deficit rose to a postwar record of 15 percent in 2020, in part boosted by \$5 trillion of relief provided by Presidents Trump and Biden.

In sum, we see “loops” that are similar to those we saw for Japan (see the appendix for other decades, also with similar, although less dramatic, loops). Robust growth pushes the deficit ratio toward a surplus, which slows growth and restores an ugly deficit that puts a floor to the recession and eventually turns the economy around. Rinse and repeat over the decades.

Before turning to a summary of findings for a number of other countries, let us consider the implications of adding Godley's sectoral balances approach to our analysis.

### **Sectoral Balances: an important additional factor to consider**

In this section we look at sectoral balances for the US and Japan. While we've shown that the relationship between growth rates and deficit ratios reacts in similar ways over time, it is important to note a very big difference between the two countries: the USA is a net importer while Japan is a net exporter. We focus on what this means for the government balance.

At the aggregate level, spending equals income. We can divide the aggregate into different sectors, and exactly how we do that depends on what we are investigating. For our purposes we begin with just three sectors: domestic government (for the US we use all levels: federal, state, and local governments), domestic private (includes households, firms, and nonprofits), and the external sector (rest of the world). Any one of these can spend more than its income, less than income, or can balance income and spending. The sum of balances across sectors must be zero (i.e., a balance between income and spending).

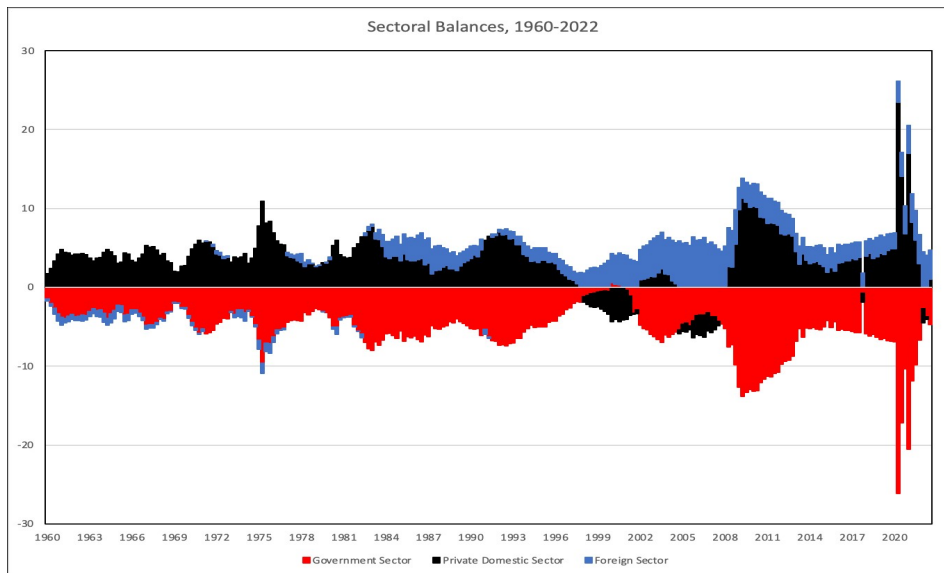
Countries use different approaches to accounting. Ideally, flow of funds accounts are best—they count actual flows of spending and income. However, not all countries collect this data. Using GDP (or GNP) and gross national income (GNI) can approximate the flow of funds. In that case we use the identity that  $(G-T) + (I-S) + (NX) = 0$ , which means that the government's balance (G-T) plus the private sector's balance (I-S), plus the balance with the rest of the world (exports-imports, or net exports) is zero. Assuming the external balance is zero, a government deficit (G-T > 0) would mean the private sector has a surplus (I < S).

The following graph shows the US sectoral balances. As shown, the government sector taken as a whole runs deficits almost all the time (because state and local governments are required to balance their budgets—and typically come close—it is the federal government's deficit that dominates movements of the sectoral balance), while the domestic private sector almost always runs surpluses. And since the Reagan years, the external account is almost always negative

(meaning the US runs a current account deficit). The sum is zero, which is why the graph presents a mirror image.

We see the huge outlier occurs during the Presidency of Clinton when the private sector balance goes hugely negative and the government's balance goes into surplus. In fact, there are two periods of private deficits—the first is before the Dot.com bubble bursts and the second is just before the GFC. The bursting of the Dot.com bubble caused a relatively short recession that was relieved by bubbles in the housing and commodities markets—during which the private sector went into another deficit (largely due to spending on housing and borrowing against houses for consumption). This time, the government sector remained in deficit. When those bubbles burst the economy went into a deep recession and the private sector surplus reached a record high—until the COVID recession—as did the government deficit.

## US SECTORAL BALANCES



What is also important to notice is the foreign sector balance—which before the Reagan administration was in deficit (the US had a surplus against the rest of the world). After Reagan, the foreign sector runs a surplus against the USA, which tended to grow until after the GFC

(when it remained positive but relatively stable). What is the implication? It means that some of the beneficial boost of a government budget deficit leaked out of the economy to the foreign sector. With a chronic current account deficit, for any given size of budget deficit, the private sector surplus is smaller.

Looking at the sectoral balance graph, we do see that the budget deficits tend to get bigger as the foreign sector balance moves from deficit to ever larger surpluses until the GFC. Ignoring the deep recessions of the GFC and COVID, the private sector surpluses are smaller beginning with the Clinton administration—indeed they turn into deficits—and after the GFC private surpluses are relatively small (until COVID). For every dollar of government deficit, the private surplus is smaller because of the leakage to foreign sector surpluses. Given the private sector’s desire to accumulate saving, the US government taken as a whole must run larger deficits to account for foreign surpluses. In a sense, the bigger budget deficits are “baked-in” by the current account deficit.

Finally, looking at balances from this view, it is obvious that the balances of each sector are linked to one another. To reduce the government’s deficit, either the domestic private sector or the foreign sector must reduce its surplus. To the degree that the domestic private sector or the foreign sector has discretion over its decision to spend out of income, that means the US government sector has less discretion over its own balance.

Returning to Lerner’s functional finance approach to the government budget, the government’s balance should be determined by what is necessary to balance the economy. In the context of the sectoral balance approach, the government balance should be that which allows the domestic private sector to achieve the balance between its income and spending that it desires, taking into account the desires of the foreign sector. Given that the rest of world wants to accumulate US dollar assets, that means it wants to run a surplus against the US. If the domestic private sector also wants to run a surplus—to save for the future—then the budget deficit must equal the sum of the desired savings of the other two sectors. How do those two sectors adjust behavior to achieve the desired result? The domestic private sector spends less to save more; the foreign

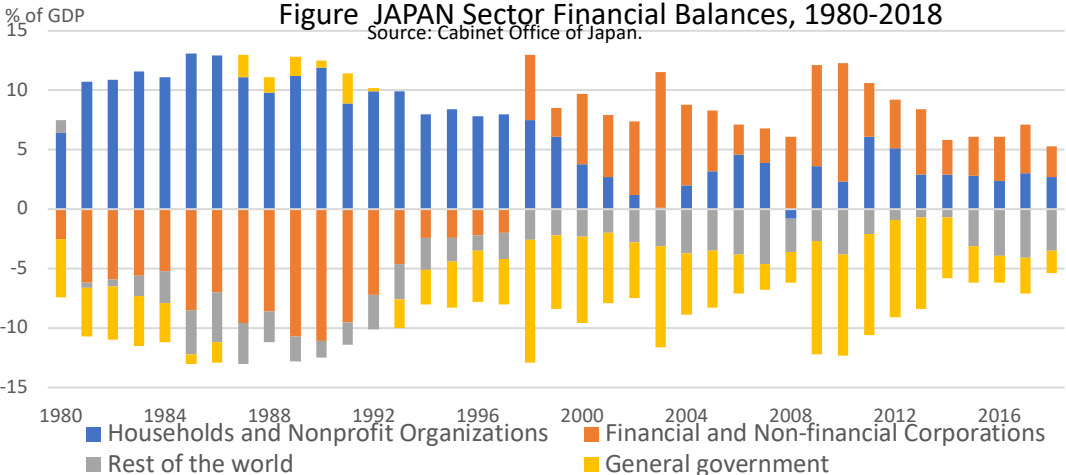


sector exports more and imports less from the US. The result of those two behavioral tendencies is lower growth of GDP in the US, lower tax revenues, and bigger US government deficits.

In sum, for any level of desired domestic saving, and for any given level of growth of GDP, the implied size of the deficit of the USA government has grown along with the size of its current account deficit. It is not surprising that deficits and debt ratios have tended to rise, with the US's transition to its position as a big net importer.

What about Japan? As the following figure shows, it is in a different position, with large current account surpluses—typically around 4 percent of GDP. Like the US, it has large budget deficits, except for the period in the late 1980s when it ran surpluses. The combination of budget deficits plus current account surpluses acts as a spending injection into the economy that is matched by saving leakages of the private sector.

In the case of Japan, we have separated domestic household balances from the balances of firms—because their balances differ greatly in recent years. (So we are presenting four sectors: firms, households, government, and foreign—and the sum of their balances must be zero.) Until 1997, domestic firms ran deficits, adding net spending to the economy. This allowed household saving rates to reach 10 percent of GDP in the 1980s and much of the 1990s. In spite of high savings rates, the economy performed well because of the combination of deficits run by the government, domestic firms, and the foreign sector (that imported Japanese products).



But private firms became net savers after 1997—which contributed to slower growth. That slower growth, in turn, affected government tax revenue so budget deficits tended to be higher. Household saving fell considerably at the end of the 1990s, and again in 2008 (when it fell below zero) although it increased as the GFC spread around the world.

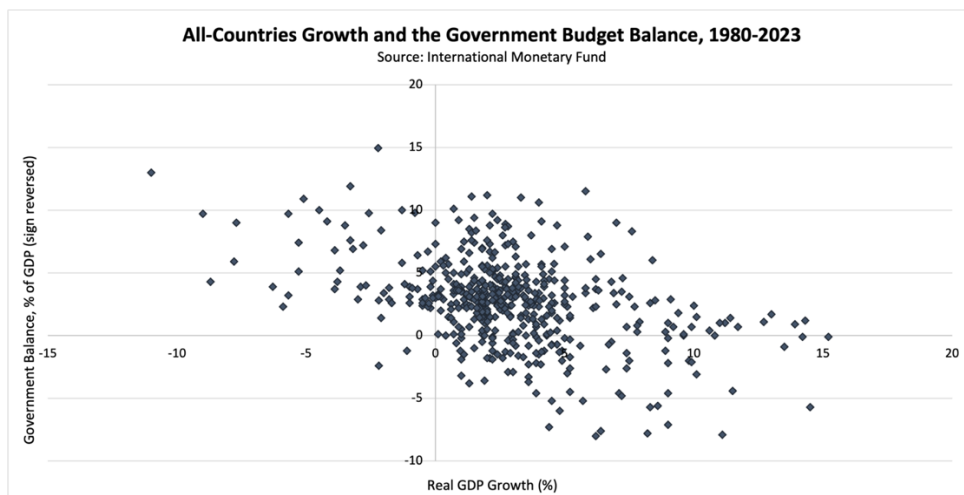
As we have argued, from the functional finance perspective, the government’s budget plays a balancing role: it balances the net saving of domestic households and firms, and also the foreign sector’s desire to run a current account deficit. In the case of the US, the foreign sector runs a surplus, accumulating dollar-denominated assets. This must be matched by a domestic deficit—by firms, households, or government. In the US, it is the government that runs the deficit. In the case of Japan, the foreign sector runs a deficit against Japan, allowing Japan to accumulate foreign currency denominated assets (including US dollars—Japan is among the top holders of US Treasury bonds). The implication is that, in comparison to Japan, the US must operate with lower private savings or a bigger government deficit, given its current account deficit.

## **SUMMARY OF FINDINGS FOR OTHER NATIONS**

The appendix presents Wray Curves for a variety of other countries. Here we summarize general findings. As discussed, we argue that there is no simple correlation between deficit ratios and growth rates. Deficits can increase because an economy slows, but deficits can also help an economy to grow faster by boosting demand. We called the first scenario an ugly deficit and the second a good deficit. The following table summarizes our findings. For the purposes of this summary of findings, we define an ugly deficit as a situation where GDP was growing slowly while the deficit was growing for a period of three years in a row; a good deficit was defined as a period with rising growth and a growing deficit for three years in a row (column 3), or for at least two years in a row (column 4). What we found is that most countries experienced both kinds of deficits, although ugly deficits were more frequent and more persistent. In other words, slow growth is more frequently the culprit leading to deficits.

<b>Country</b>	<b>Ugly Deficit</b> (slow growth + growing deficit for 3 or more years)	<b>Good Deficit</b> (rising growth + growing deficit for 3 or more years)	<b>Good Deficit</b> (rising growth + growing deficit for 2 or more years)
Russia	2013 – 2016	N/A	N/A
China	N/A	1990 – 1992	1991 – 1992
Japan	1990 – 2003, 2006 – 2012, 2018 – 2022	1994 – 1996	1984 – 1985, 1995 – 1996
Singapore	N/A	N/A	N/A
Canada	1988 – 1992	1982 – 1985	1983 – 1984, 1992 – 1993
United States	2005 – 2009	2001 – 2004	2003 – 2004
Brazil	2012 – 2020	2005 – 2010	2006 – 2007
Mexico	2000 – 2003, 2010 – 2016	1995 – 1998	1996 – 1997, 2003 – 2004
United Kingdom	1989 – 1993, 2000 – 2012	1980 – 1987	1982 – 1983, 1993 – 1994
Germany	1991 – 1995, 2000 – 2005	N/A	N/A
France	1989 – 1993, 2000 – 2003, 2006 – 2009, 2017-2020	1983 – 1988	1984 – 1985, 1985 – 1986,
Netherlands	1991 – 1993, 2000 – 2003, 2009 – 2013	1982 – 1989	1983 – 1984
Italy	1988 – 1993, 2000 – 2020	N/A	2016 – 2017

Indeed, if we plot the data from all the countries we examined, we obtain the following scatter plot:



There is a generally negative relationship, with slow or negative growth associated with larger budget deficits, and higher growth associated with very low deficits and surpluses. This favors the view that the budget balance is largely nondiscretionary and determined by economic performance. While this is also consistent with the view that big deficits crowd-out private spending by pushing up interest rates, we have rejected that argument because it is not consistent with data showing interest rates can be very low even with high deficits. Nor is it consistent with the effects of government spending on bank reserves (with deficits increasing them, which should put downward pressure on overnight interest rates). And finally, it is not consistent with the modern understanding of central banks targeting interest rates as the main policy.

### **Sustainability and Government Spending on Interest**

There is one other issue to consider: as the amount of outstanding debt increases, government must spend more on interest. As discussed above, orthodoxy worries that this will lead to unsustainable growth of the deficit and debt ratios if the interest rate is greater than the growth rate of GDP. We have argued that the interest rate is a policy variable, so the central bank could keep it below the growth rate—so long as the growth rate is above zero. Still, we do not need to go to the extreme situation of the debt ratio going to infinity before worrying about the impact of rising interest payments on debt.

With a high debt ratio, a larger portion of government spending takes the form of interest payments to holders of bonds, which could be highly undesirable. First, the individuals holding

bonds tend to be wealthier, so interest payments will likely increase inequality. Second, interest payments are likely to be less efficient in terms of increasing productive capacity. Compared to government spending on public infrastructure, education, and healthcare, spending on interest is probably less productive in terms of increasing capacity or raising living standards. Interest is also a cost—to business and to consumers. While economists nearly universally believe that raising wages, energy prices, or rents would tend to introduce inflation pressures, most believe that raising interest rates is disinflationary. MMT proponents argue that, within the typical range of interest rate movement, the direct impact on spending is not large because spending is not very interest sensitive. However, rising rates do figure into costs and also (as discussed above) add to net private sector income—especially if the government’s debt ratio is high relative to that of the private sector. Hence, raising rates in an attempt to fight inflation could be counter-productive. At the extreme, raising rates could even be inflationary as it adds to costs and could stimulate spending by raising interest income.<sup>8</sup>

On the other hand, many and even most bonds are typically held by institutions such as retirement funds, insurance companies, university endowments, and financial institutions. An argument could be made that supporting the institutional holders of bonds by paying interest on risk-free bonds serves some social purpose. However, private debt (that does carry default risk) must compete with government bonds by offering higher rates. In the absence of government bonds, institutional investors would have to compete for private bonds—perhaps lowering interest rates paid by borrowers. Finally, especially in the case of the US, a lot of bonds are held outside the country—so government interest payments go to foreigners and contribute to the flow of dollars abroad. This increases current account deficits and might place downward pressure on exchange rates. For a variety of reasons, high government interest payments on its bonds might be undesirable.

For all these reasons, MMT proponents generally support monetary policy that keeps the overnight rate relatively constant and low. This will limit government interest payments that are

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<sup>8</sup> For a model that demonstrates the possibility that raising rates could stimulate the economy because of government interest payments see Linwood Tauheed and L. Randall Wray, Chapter 3: “System dynamics of interest rate effects on aggregate demand”, pp. 37–57 in *Money, Financial Instability and Stabilization Policy*, Mathew Forstater and L. Randall Wray, editors, Edward Elgar Publishing, 2006.

probably not very efficient in terms of promoting economic growth. Lower rates also favor long-term investment in capacity and housing (important in the US, which currently has a serious housing shortage). And relatively stable interest rates help to support stability in the financial sector.

The most important takeaway for our argument here is that the interest rate is a policy variable. The simple mechanical demonstration that government's debt ratio will explode if the interest rate is above the growth rate is of little practical value. The interest rate can be held below the growth rate by policy. Further, as we've shown, the budgetary outcome is largely endogenously determined. The deficit ratio moves over the course of the cycle in a manner such that it is self-limiting—neither continually rising deficits nor continually rising surpluses are displayed in the data for any of the countries we have observed. As an economy slows, the deficit ratio rises (or, in the case of a country with a budget surplus, that surplus falls and may go into a deficit) and that can boost the debt ratio. Interest payments on debt add to both of these ratios, helping the economy to recover. Monetary policy usually loosens in recession, lowering the rate paid on new issues of government debt and helping to moderate growth of deficits. Recovery of economic growth reduces the deficit and the rate of issue for new debt. The debt issued during the recession will persist in portfolios, but at lower interest rates as the growth rate increases. For these reasons, the simple mathematical exercise is not useful as a guide to “debt sustainability.”

## CONCLUSION

We have called into question the mainstream view of sustainability of government deficits and debt. We have presented theoretical arguments based on MMT, which incorporates Lerner's functional finance approach, Godley's sectoral balance approach, and the endogenous money approach of Post-Keynesians. As such, we rejected the notion that deficits drive up interest rates, crowding out private spending. Instead, the base interest rate is set by monetary policy. We also briefly addressed the belief that deficits can spiral out of control, leading to inflation or even hyperinflation. While government spending can be too large, inflation has been well-contained in recent years as large deficits and rising debt ratios were experienced—up to the COVID

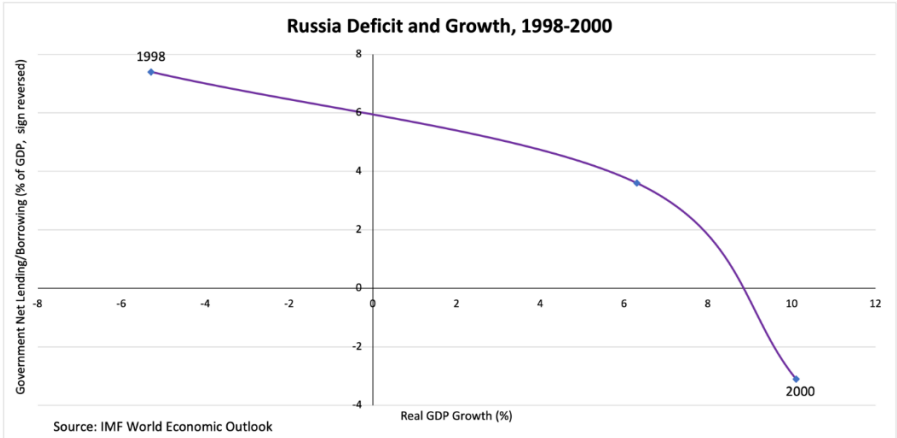
recovery. We emphasize that we do not reject the argument that excessive spending can cause inflation, but we note that deficits generally increase in recession and fall in expansion. In other words, deficits fall when there is greater danger of inflation coming from excessive demand.

Relatedly, we have emphasized that there are two paths to budget deficits—an ugly path in which recession reduces taxes and increases countercyclical spending, and a good path in which a growing deficit boosts growth. We found evidence of both, looking closely at the cases of Japan and the US. We summarized findings for a number of other countries—most of which also experienced both kinds of deficits. In the appendix we look in detail at the data for the other countries. We conclude that deficits are in some sense self-correcting because big deficits restore growth that increases tax revenue and reduces transfers. This finding is consistent with the MMT recommendation that budget policy ought to aim to balance the economy, not to match government spending with its revenue.

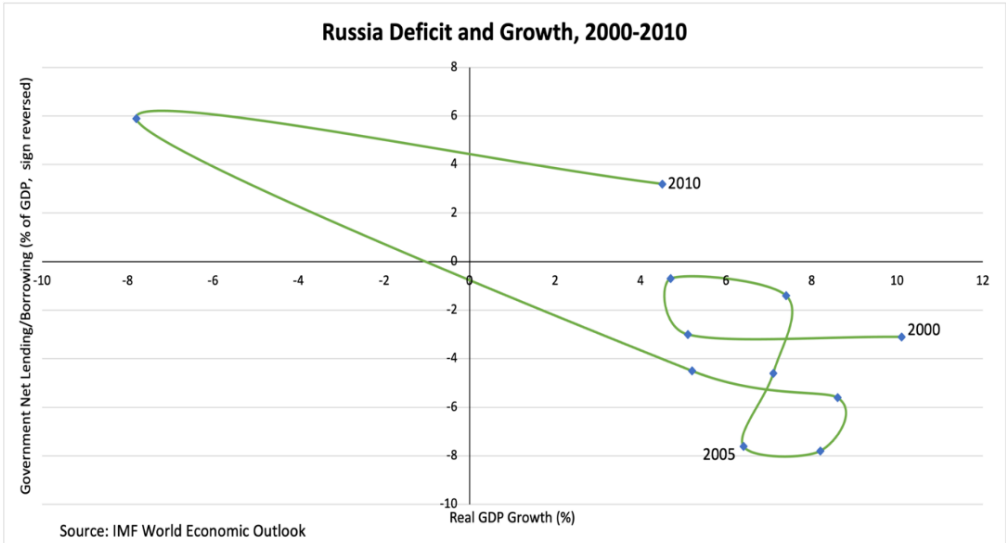
# APPENDIX: WRAY CURVES FOR A VARIETY OF COUNTRIES

## Russia, Asia and Pacific

### Russia

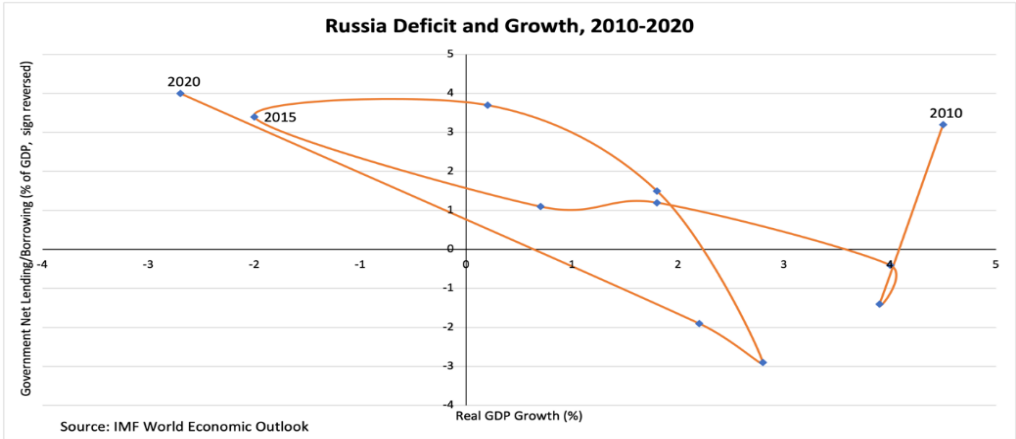


Due to data availability, the first graph only shows the period 1998–2000. The Wray Curve for Russia in this period shows a negative relationship between the deficit-to-GDP ratios and GDP growth rates. In 1998, Russia’s growth rate was negative. However, in the next two years, growth rates increased and peaked at 10.1 percent in 2000 while the budget deficit declined, reaching a surplus in 2000.

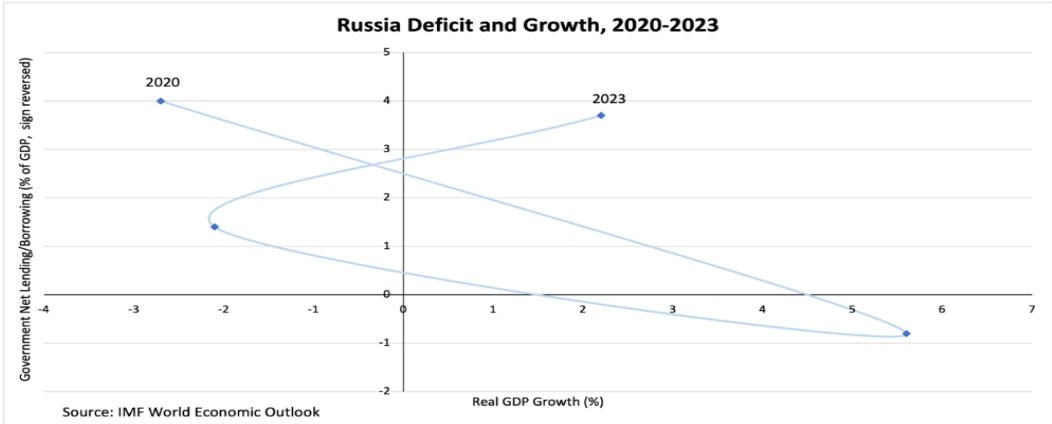




The second graph shows the period 2000–2010. For most of the period, Russia had a growing budget surplus with rapid growth in a range of 4.7 to 8.6 percent annually. In 2009, the economy was hit by the Global Financial Crisis, with negative growth producing a budget deficit equal to 6 percent of GDP. However, the economy quickly recovered, almost to its pre-crisis level, with the aid of the budget deficit.

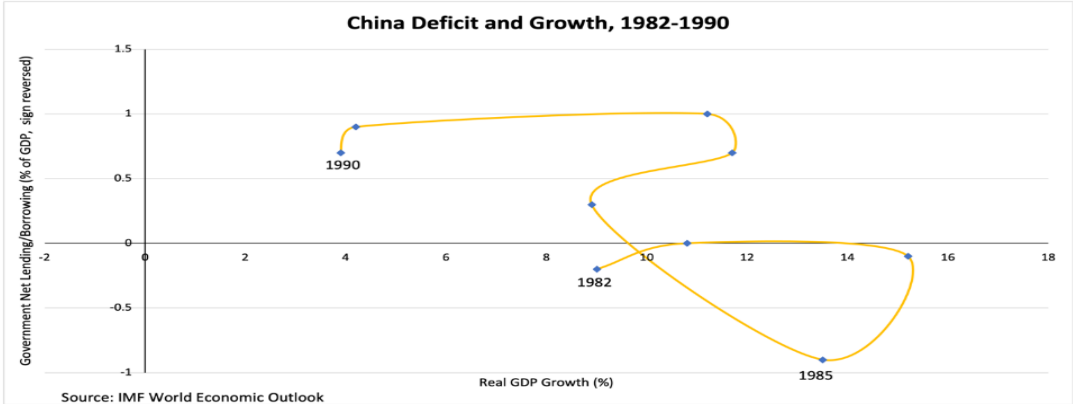


The third graph shows the period 2010–20. This period can be divided into three stages. In the first stage the recovery of growth restores a small budget surplus, followed by slowing growth that goes sharply negative by 2015. With the collapse of growth, a deficit returns. In the second period, the high deficit ratio restores growth—the “ugly” way. The third stage begins in 2018 as the budget yet again moves to a surplus and growth turns sharply negative. Another ugly deficit is produced.

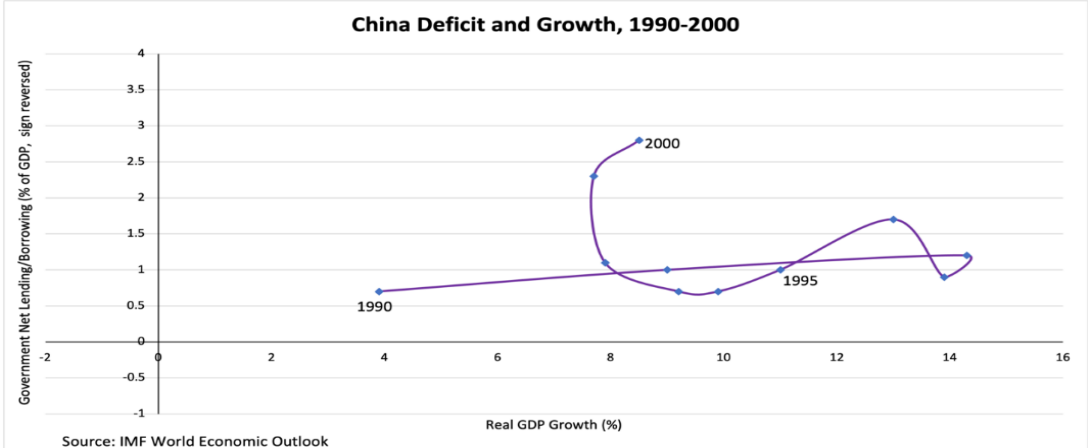


The fourth graph shows the period 2020–23, and what we see again is recovery that produces a budget surplus, followed by another ugly deficit and then a recovery. As of 2023, GDP was growing at a 2 percent pace while the deficit ratio rose to 4 percent of GDP—unlike previous recoveries, the deficit rose with faster growth. This could be related to war spending that boosted both growth and the deficit.

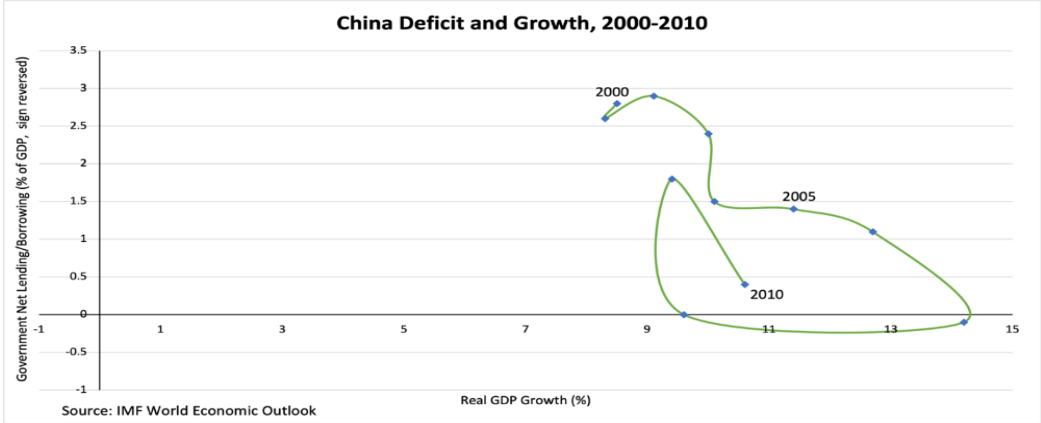
*China*



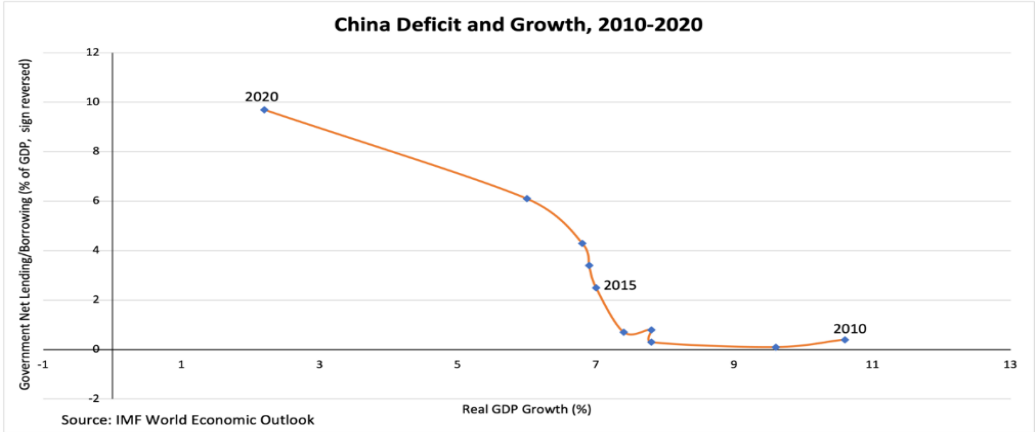
The first graph shows the period 1982–90, during which China maintained high growth rates from 1982–88. In the first four years, the budget was balanced or in surplus, but it moved into a small deficit in 1986 as growth slowed from more than 13 percent to about 9 percent. Although growth resumed a pace above 11 percent for the next two years, the deficit increased to 1 percent of GDP. In the final two years, growth fell sharply while the deficit remained above 0.5 percent.



The second graph shows the period 1990–2000. In the first half of the period, the deficit and growth increased together—possibly indicating a good deficit, while the last half of the period saw growth falling and the deficit rising.

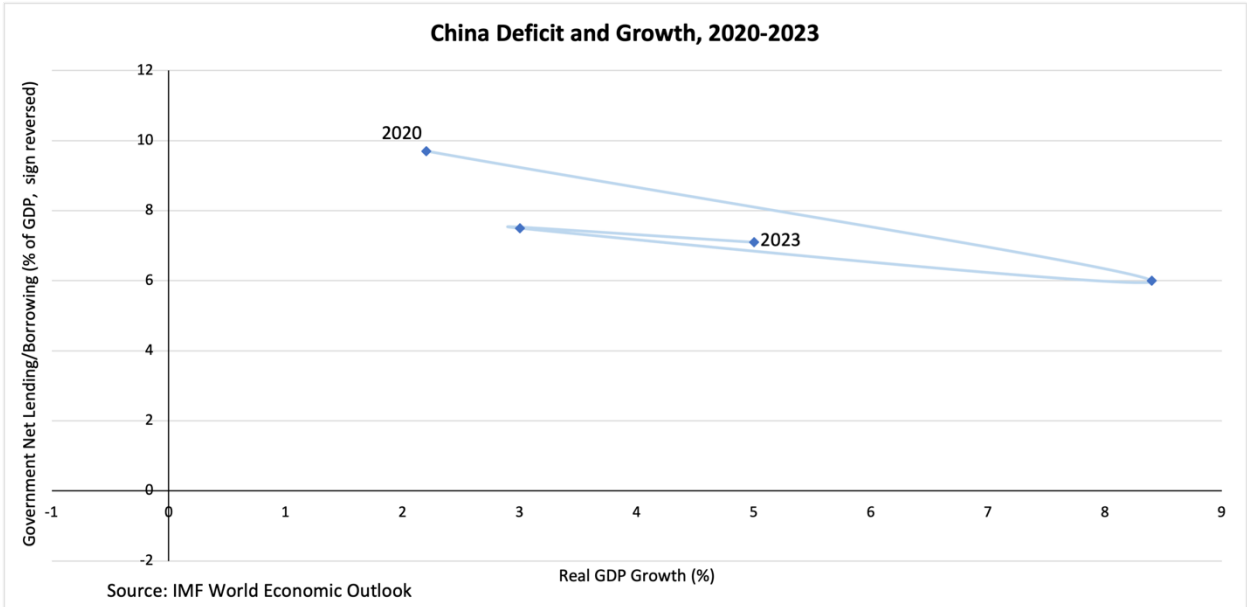


The third graph shows the period 2000–2010, over much of which, growth was rising and the deficit was falling—reaching a budget surplus by 2007. The tighter fiscal stance was associated with lower growth; with lower growth, the budget returned to a deficit by 2009. It is possible that the GFC played a role in reducing the growth rate between 2007 and 2009, with recovery in the West boosting growth in 2010. The budget returned nearly to balance by the end of the period.



The fourth graph shows the period 2010–20. The growth rate fell nearly continuously over this period. In the first half, the budget remained near balance, but midway through the decade the deficit rose sharply. Of course, the COVID-era disruptions to trade undoubtedly contributed to

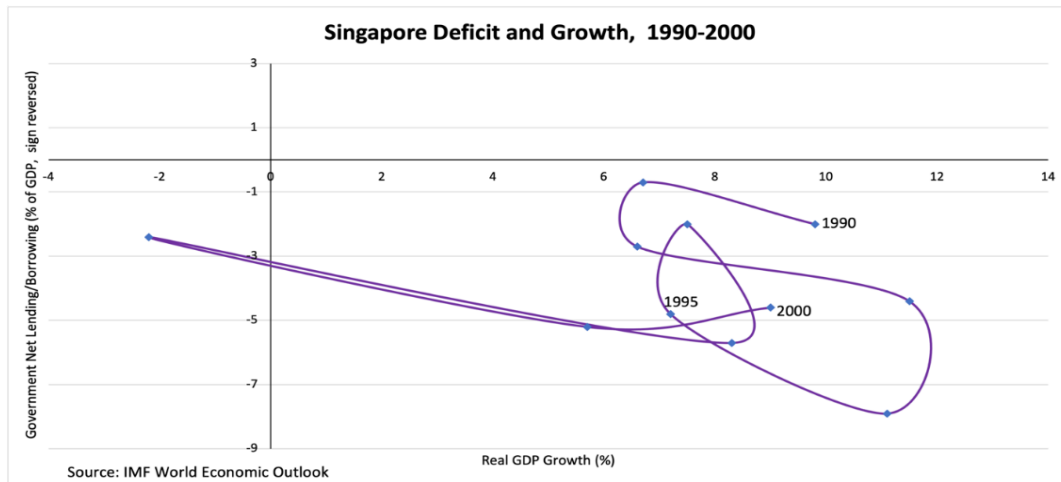
the fiscal outcome. The following graph shows growth resuming as trade, however, China’s series of lockdowns in 2022 likely caused growth to slow again, and the deficit to rise.



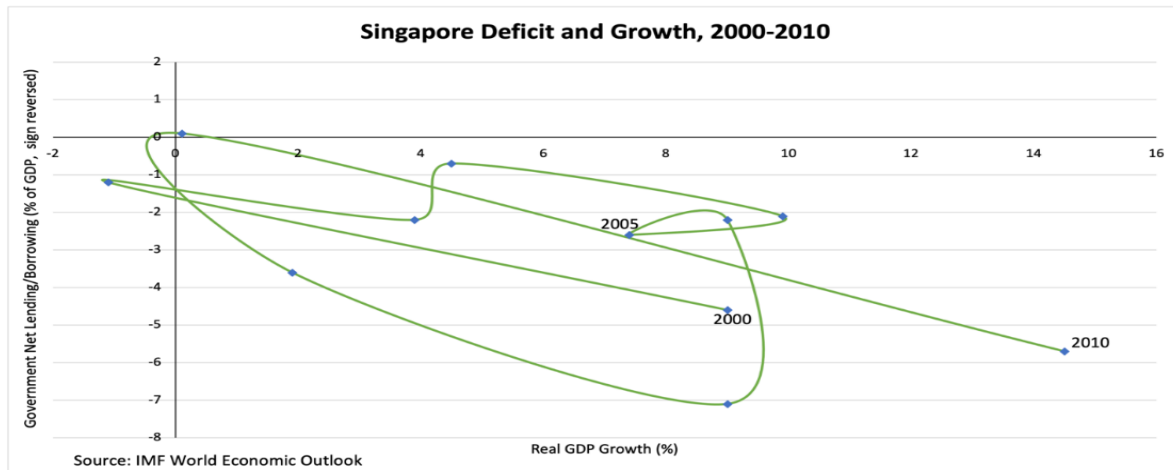
The deficit-to-GDP ratio remained in the range of 6–10 percent, with growth remaining subpar by Chinese standards.

*Singapore*

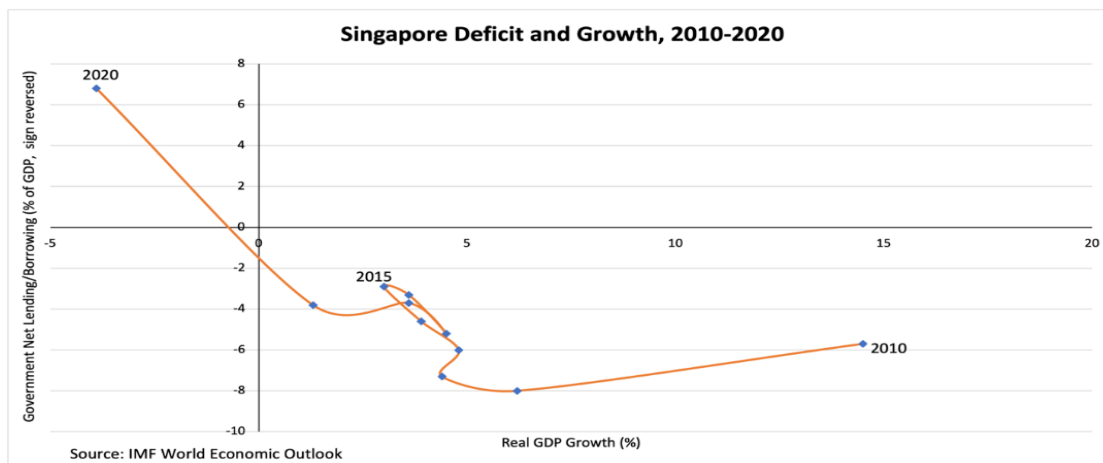
The first graph shows the period 1990–2000. Throughout this entire period, Singapore operated with a budget surplus while maintaining high GDP growth rates, with only one exception in 1998 when the economy temporarily dropped to a negative growth rate of 2.2 percent. As growth collapsed, the surplus fell. The economy recovered with a growth rate of 5.7 percent in the following year, boosting the surplus.



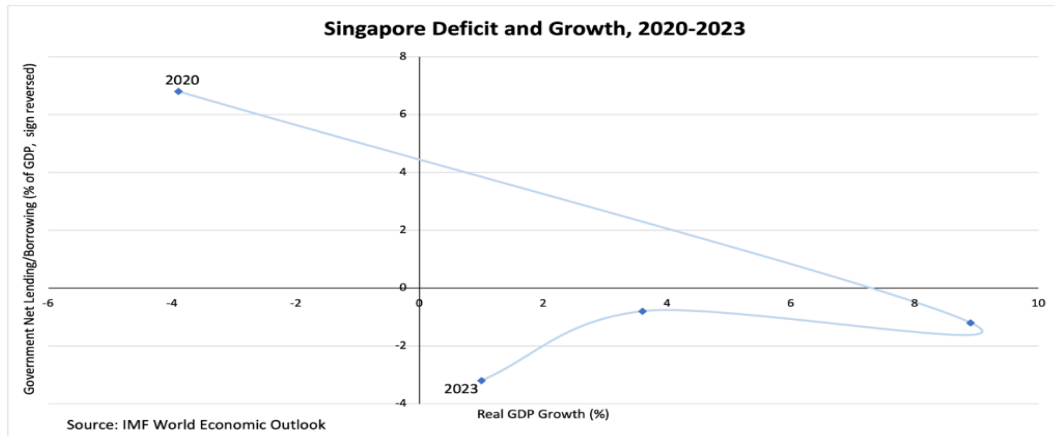
The second graph shows the period 2000–2010. With the only exception of a 0.1 percent deficit-to-GDP ratio in 2009. Singapore again maintained a budget surplus for the entire period. The Wray Curve suggests that this period can be broken down into three subperiods. The first subperiod is the pre-financial-crisis period, 2001–07. The economy maintained a rising growth rate momentum while the surplus-to-GDP ratio tended to fall. Then from 2005–07, growth rates hovered around 8 percent but with a dramatic increase in budget surplus in 2007—to 7 percent. Growth fell sharply—in part due to the GFC—and the period was marked by a combination of a 0.1 percent GDP growth rate and a 0.1 percent deficit-to-GDP ratio in 2009. However, Singapore showed tremendous resilience in the post-financial-crisis period, as the economy reached a combination of a 14.5 percent GDP growth rate and a 5.7 percent surplus (sign reversed) as a ratio to GDP. Overall, the Wray Curve is downward sloping, showing that higher growth rates are associated with a bigger surplus ratio.



The third graph shows the period 2010–20. Again, with the exception of the earliest years, the relation between the deficit ratio and growth is again negative. The COVID recession moved the budget into a big deficit, and GDP fell at a 4 percent annual pace.



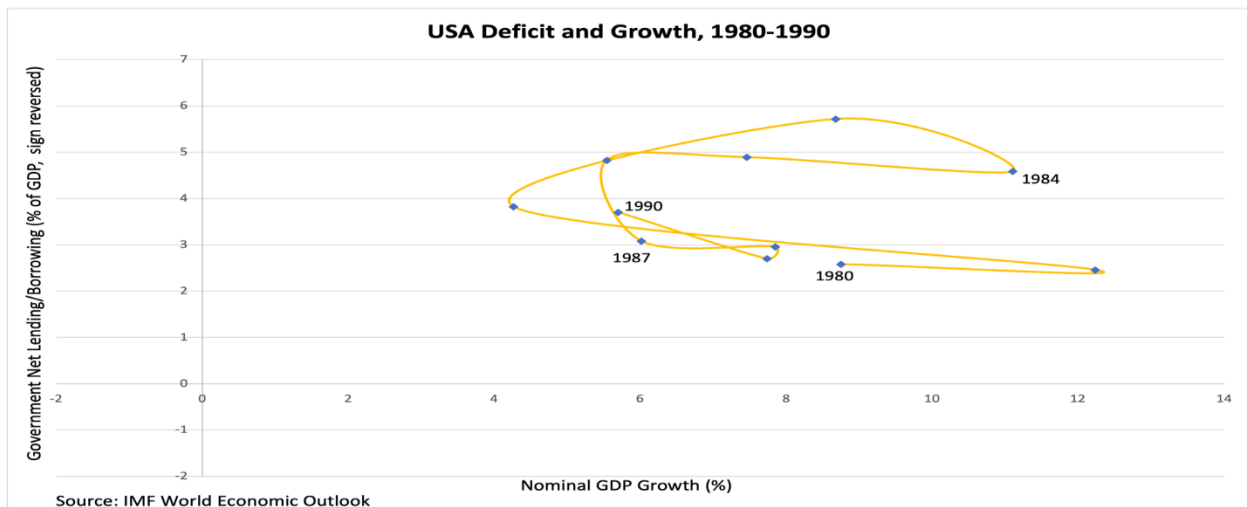
The final graph shows recovery from the recession, with fast growth restoring a surplus. However, growth quickly slowed in the last two years, as the budget surplus grew toward 4 percent.



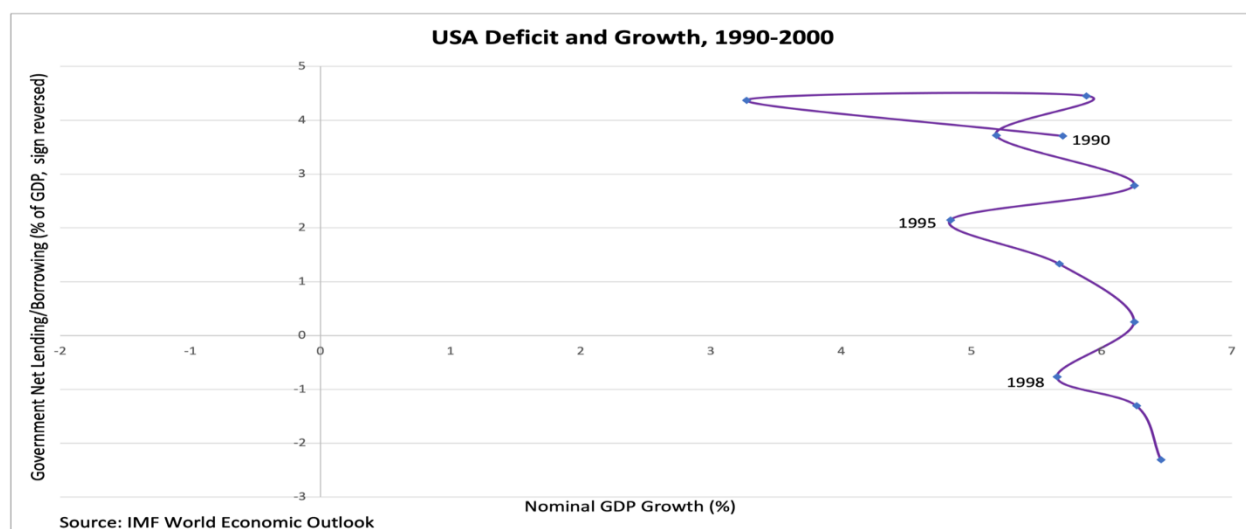
## North America

### US

As we discussed the US case in the main text, here we only examine the earlier period that was not covered—the 1980s and 1990s. The decade of the 1980s began with high inflation and a high growth rate of nominal GDP—with a low budget deficit. After Volcker increased the target interest rate above 20 percent—inducing the Saving & Loan crisis and recession—growth slowed and the deficit rose to a 6 percent ratio by 1985. Recovery gradually cut the deficit in half, inflation moderated, and the deficit declined to 4 percent with nominal growth of 6 percent in 1990.



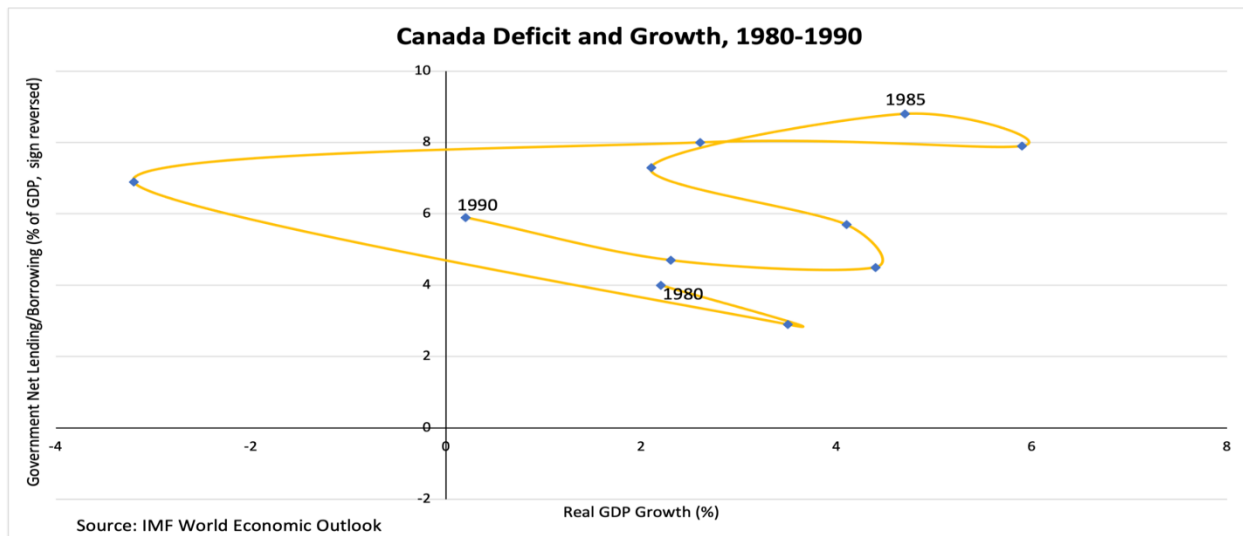
Turning to the 1990s, we begin from the mild Bush administration slow-down in 1991 and move through the Clinton expansion and the brief recession at the end of the 1990s (when the Dot.com bubble crashed). As the recovery from recession gained steam in 1992, the growth rate/deficit ratio combination moved from 3.3 and 4.3 in 1991 to 5.9 and 4.5 in 1992—a horizontal movement that was boosted in part by a growing budget deficit (up from 2.7 percent in 1989 to 4.5 percent by 1992). As the growth rate continued to climb, settling at almost 6 percent per year through the rest of the 1990s, the deficit was eliminated by 1998 and a growing surplus was created (the zigzag line drops below zero). By 2000 the surplus reached its peak at 2.3 percent of GDP and the growth rate also reached its peak of 6.45 percent. In 2001 the growth rate fell to 3.2 percent and the surplus fell. The main text examined the next decade—showing the Dot.com bubble recession and return of a deficit, and then the bubble-induced expansion that collapsed into the GFC.



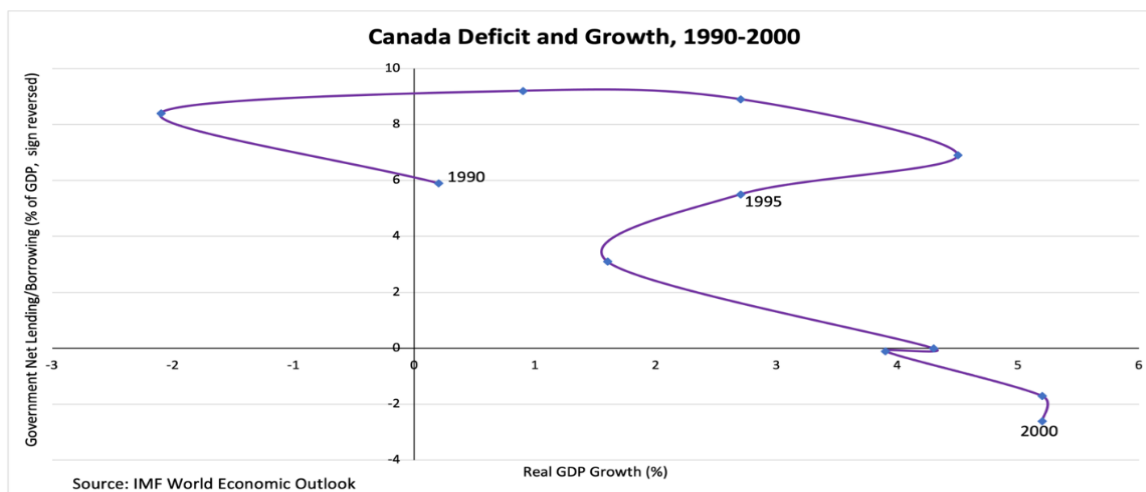
### Canada

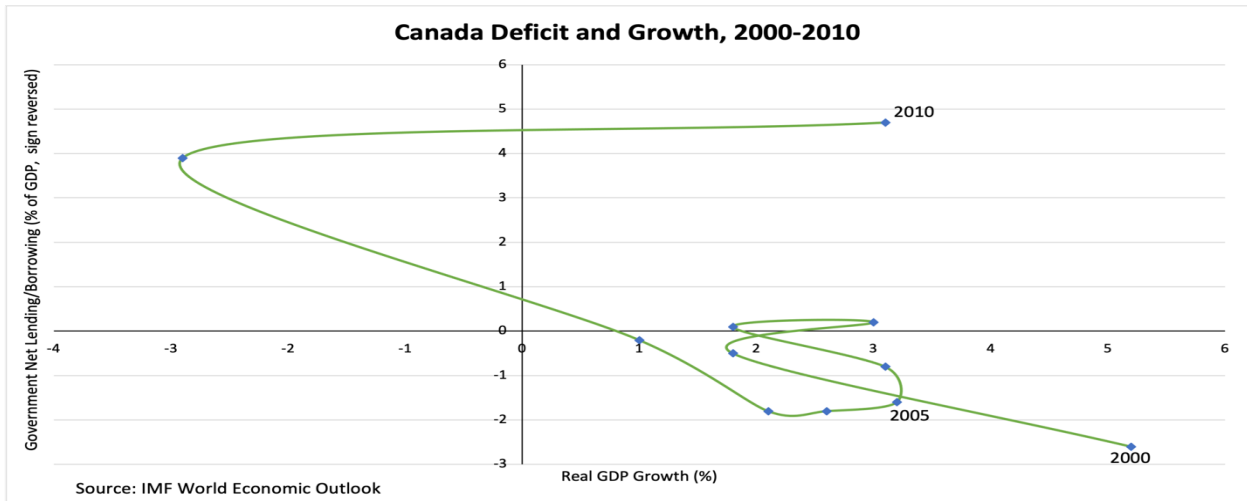
The first graph shows the period 1980–90. The Wray Curve in this period exhibited two patterns. The first half of the decades shows the economy falling into deep recession with the deficit rising sharply, and then recovering with a continued large deficit. The second half shows a falling deficit ratio and general growth oscillating between two and four percent. At the end of the decade, growth fell to zero and the deficit rose to 6 percent.



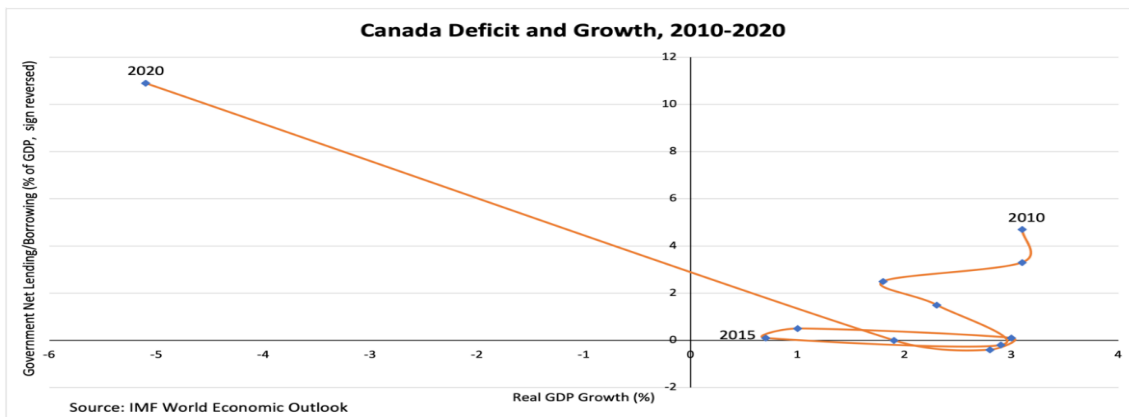


The second graph shows the period 1990–2000. The Wray curve for Canada in this period is straightforward. After a recession in the early 1990s, the economy recovered, aided by a rising budget deficit throughout 1991–94. In the next six years, Canada’s fiscal stance continued to tighten as the deficit ratio fell and the growth rate remained in the two to four percent range. The economy ended the period with a combination of a 5.2 percent GDP growth rate and a 2.6 percent surplus-to-GDP ratio (sign reversed) in 2000.

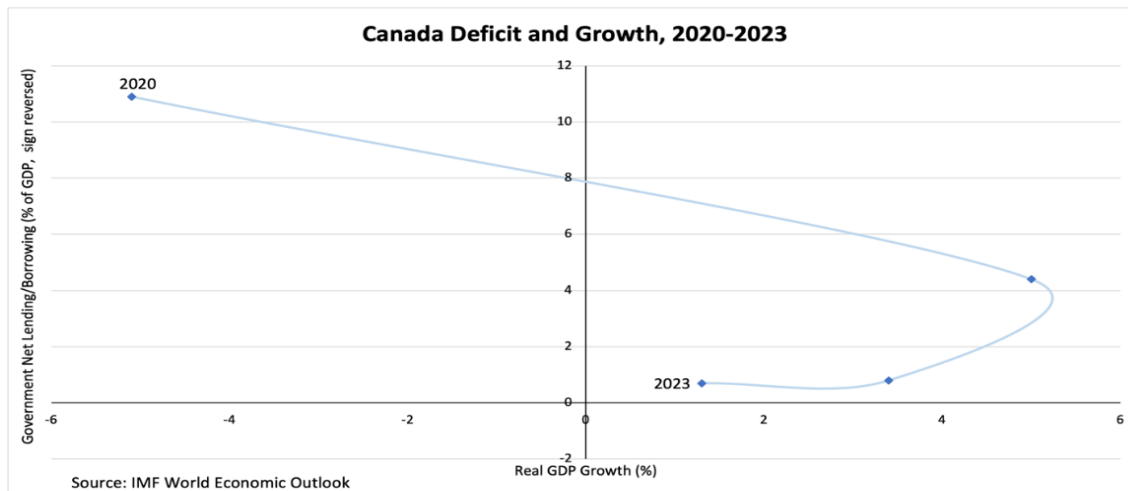




The third graph shows the period 2000–2010. Canada overall maintained a budget surplus or balance from 2000 to 2008, although the growth rate was low. The 2008 financial crisis sent the economy into a recession in 2009, but the economy recovered quickly by reaching a 3.1 percent GDP growth rate and a 4.7 percent deficit ratio in 2010.



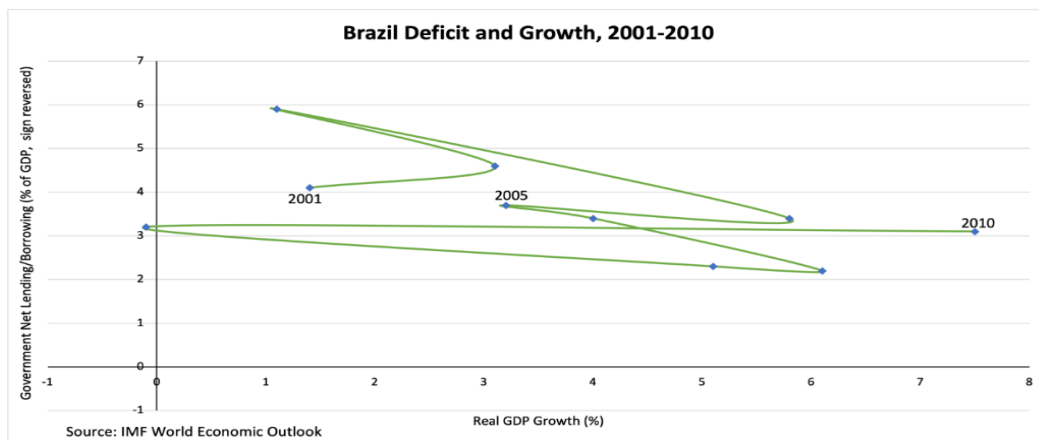
The fourth graph shows the period 2010–20. After 2010, the economy slowed as the deficit fell, with growth oscillating between 1–3 percent. The COVID recession caused a deep recession in 2020, and the deficit rose to about 11 percent of GDP.



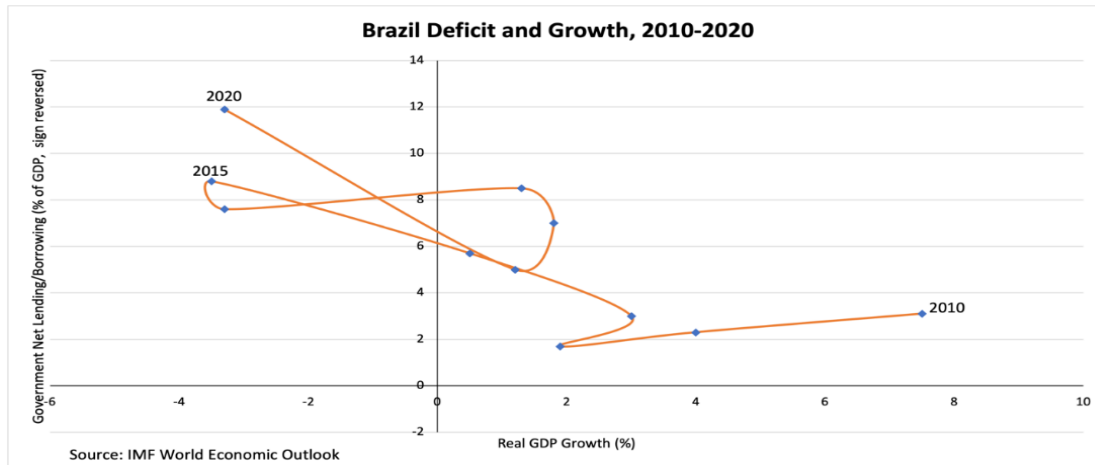
The fifth graph shows the period 2020–23. GDP quickly recovered from the COVID recession, approaching a growth rate of 5 percent in 2021. As the deficit continued to fall to nearly zero in 2023, the growth rate also fell sharply to just 1 percent in 2023.

## South America

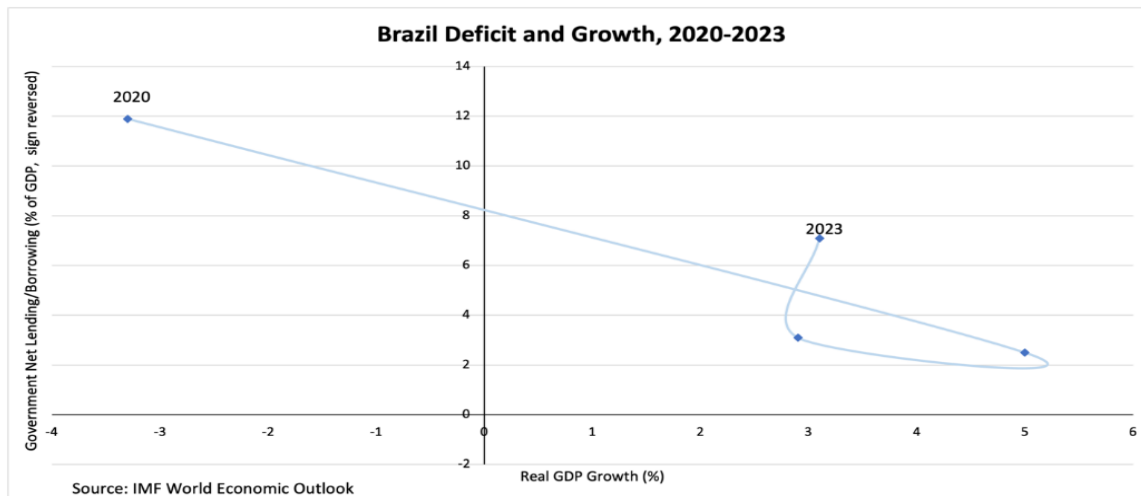
### Brazil



The first graph shows the period 2001–10. Beginning with a low growth rate in 2001, the budget deficit begins to climb to 6 percent of GDP by 2003. Over the next few years, the growth rate remains between 3 and 6 percent with a generally falling deficit ratio. Growth plummets during the GFC, although the deficit ratios hold relatively constant at about 3 percent. Growth rebounds in 2010.

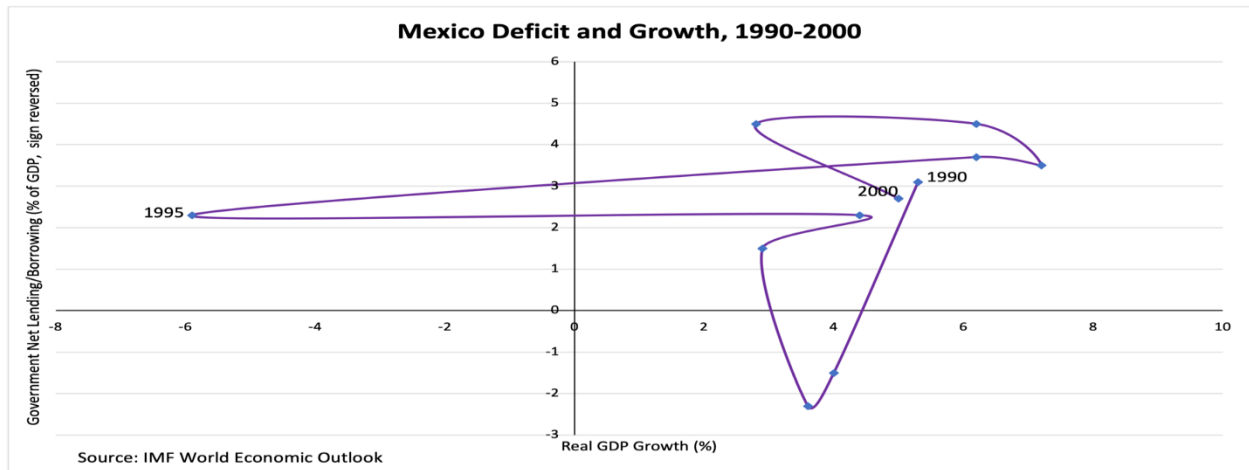


The second graph shows that growth collapsed and remained low over the subsequent decade. An ugly deficit was created, peaking first at about 9 percent in 2015 and then even higher at 12 percent in 2020. The next graph shows a relatively strong recovery in 2021 with a sharp reduction of the budget deficit, followed by weakening growth and a deficit ratio that rose to about 7 percent in 2023.

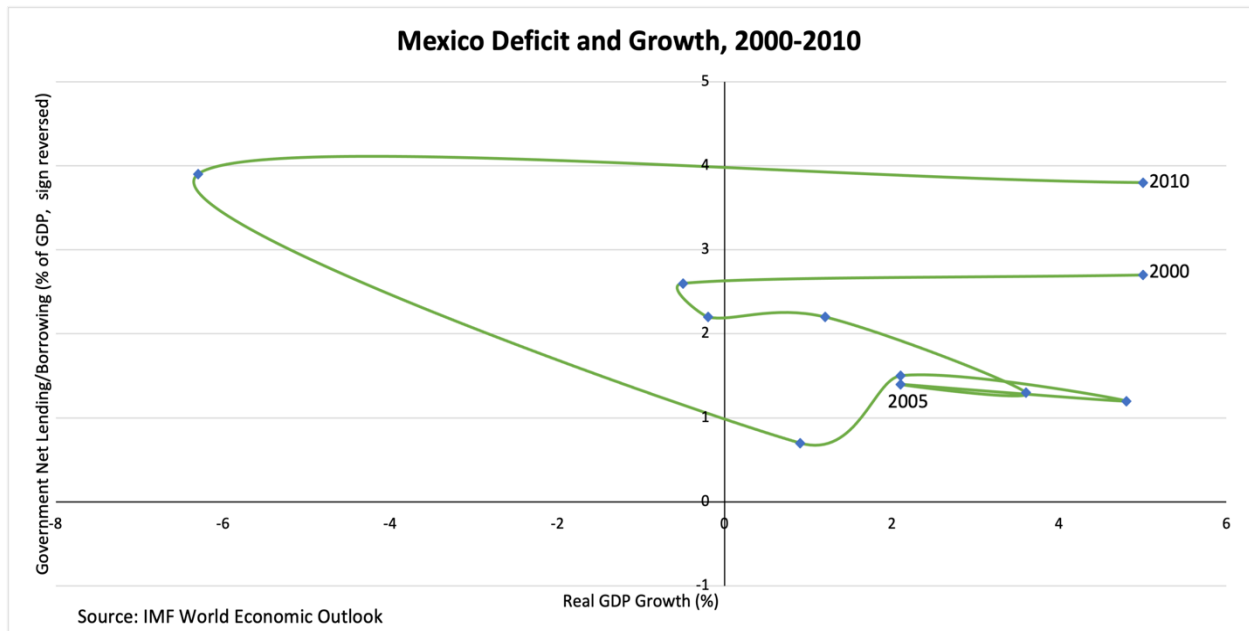


### *Mexico*

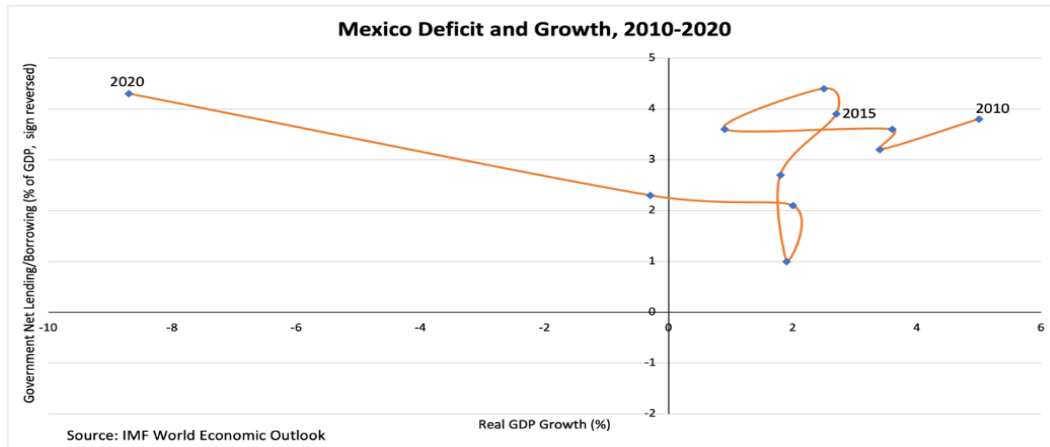
The first graph shows the period 1990–2000. As the budget moved into surplus in 1991, the growth rate fell below 4 percent and a deficit was restored in 1993 and remained through 2023. Growth rose in 1994, but a deep—albeit short—recession followed in 1995. The deficit ratio remained around 4 percent for the rest of the decade, with growth between 3–7 percent.



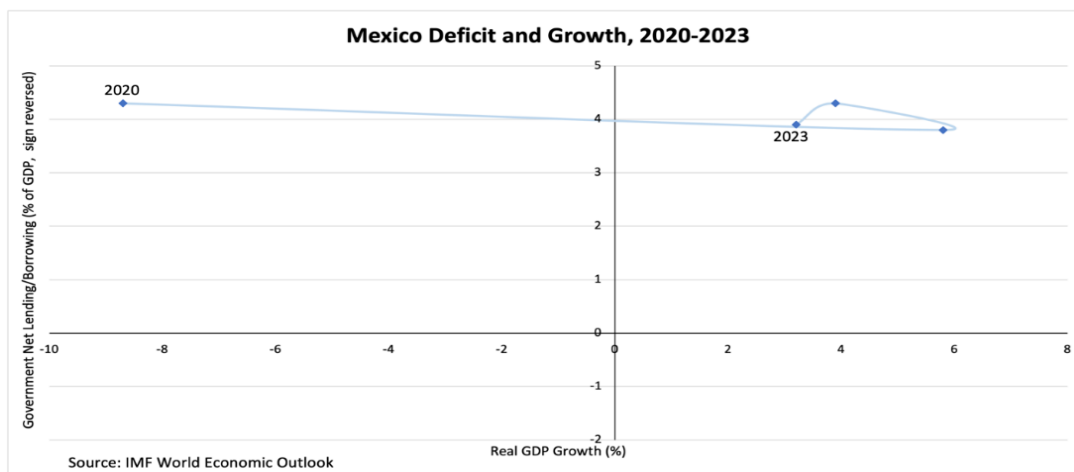
The following graph shows the next decade, with the deficit generally falling until 2008. During the GFC, GDP fell at a 6 percent rate and the deficit grew to 4 percent by 2009; this kicked off a recovery in 2010.



Over the next half dozen years, growth slowed to about 2 percent with the deficit ratio remaining around three or four percent. Near the end of the decade, the deficit ratio fell 1 percent, until the COVID recession caused output to fall sharply and the deficit to grow back above 4 percent.

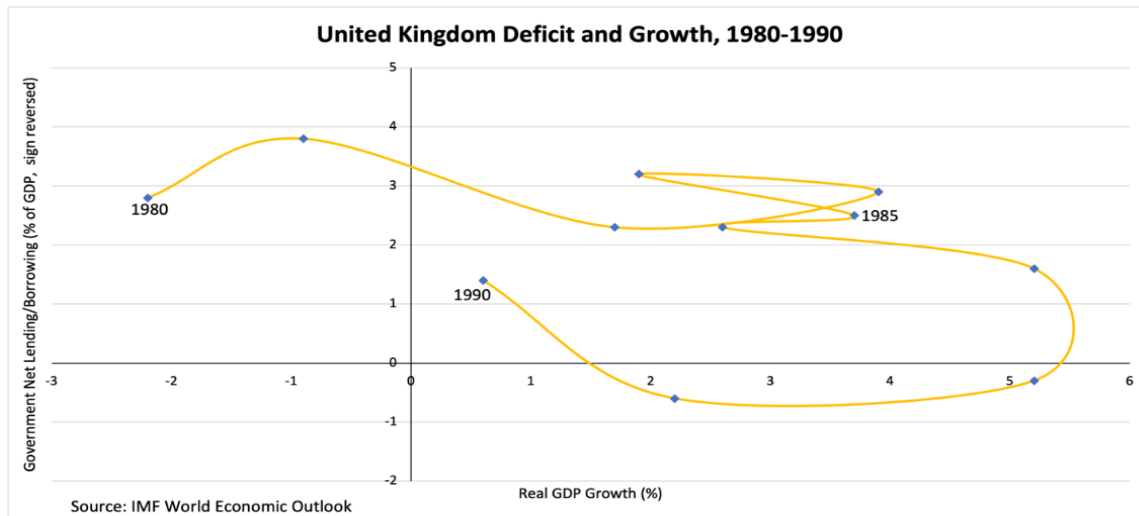


As the final graph shows, the economy recovered quickly from the recession, growing at about a 4 percent pace and with the deficit remaining at 4 percent.

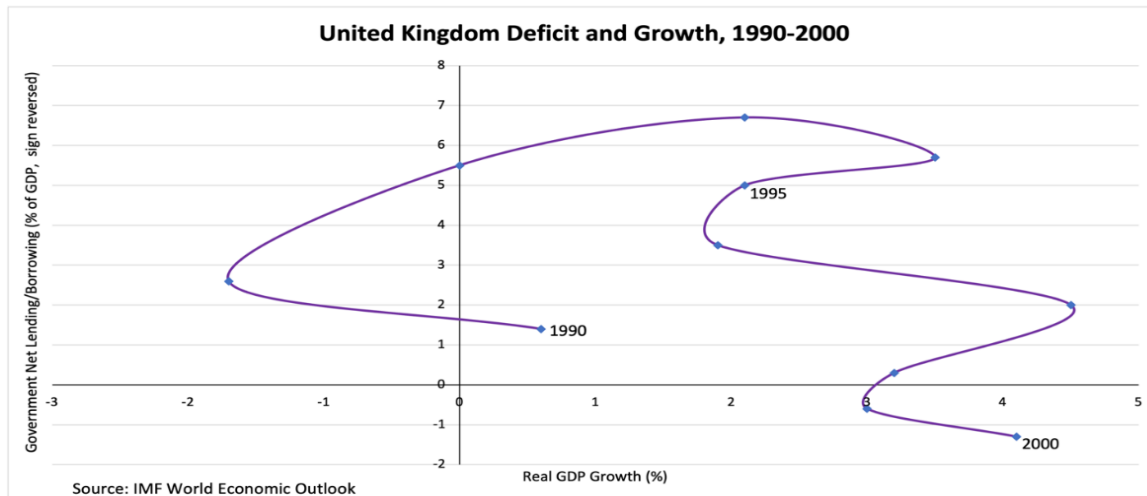


### *United Kingdom*

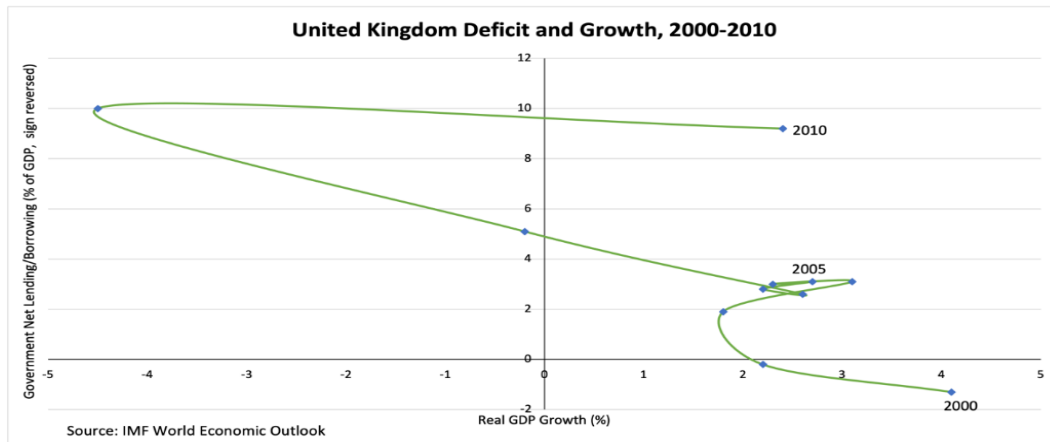
The first graph shows the period 1980–90. This period started with a combination of a moderate deficit-to-GDP ratio and a negative growth rate. While the budget deficit fluctuated between 2 and 4 percent of GDP between 1980 and 1986, the economy recovered from the recession and saw a steady increase in growth rates. Rapid growth in 1987 and 1988 allowed the deficit to fall steeply, generating a budget surplus for two years. A slowdown followed, with restoration of a budget deficit at the end of the decade.



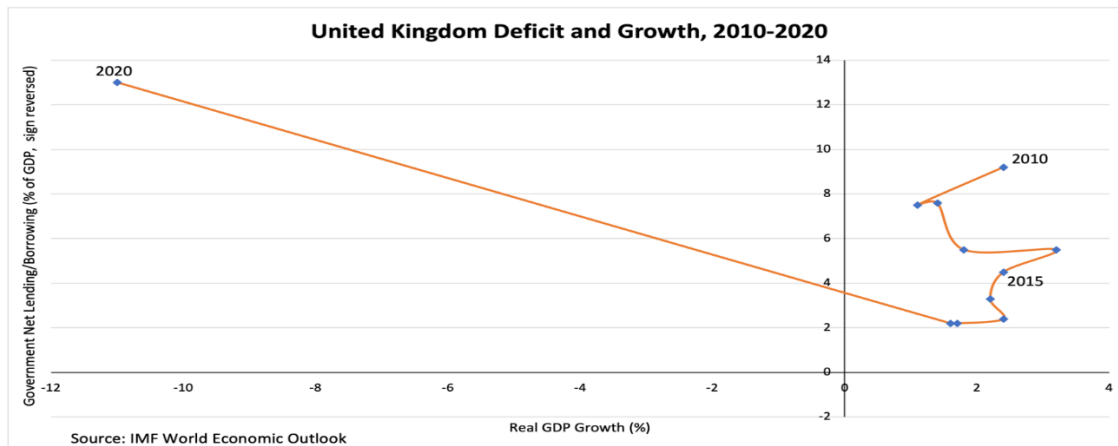
The recession deepened in 1991 and the deficit ratio rose to almost 7 percent by 1993. As the economy began to recover, the deficit continuously fell; the growth rate swung between two and four percent over the rest of the decade and another budget surplus was achieved at the end of the period.



Over the following decade, growth slowed to two-to-three percent a year as the deficit gradually rose. As the next graph shows, the GFC pushed the UK into a deep recession at the end of the period and the deficit ratio reached a high of 10 percent of GDP. By 2010, an anemic recovery had begun.



The next graph shows growth stabilizing above 2 percent and the deficit ratio falling continuously over the decade. The COVID recession resulted in a deep recession and a new high for the deficit ratio at about 13 percent of GDP.



The final graph shows the recovery from the recession. The big deficit allowed growth to reach nearly 8 percent, reducing the deficit. As the deficit ratio dropped to 4.5 percent in 2023, so did the growth rate—which fell to just above zero.



