# Twin Deficits in the Short- and Long-Run

Adrien Auclert* Matthew Rognlie† Ludwig Straub‡

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## 1 Overview

The covid epidemic has led to rapid increases in government debt, in many countries to levels not seen since the second world war (Figure 1). A critical question for policymakers is how this increase in government debt can be sustainably financed. It is well known that, as a matter of national accounting, the budget deficit $B_{t+1} - B_t$ must be equal to the difference between private saving $S_t$, investment $I_t$, and the current account $CA_t$,

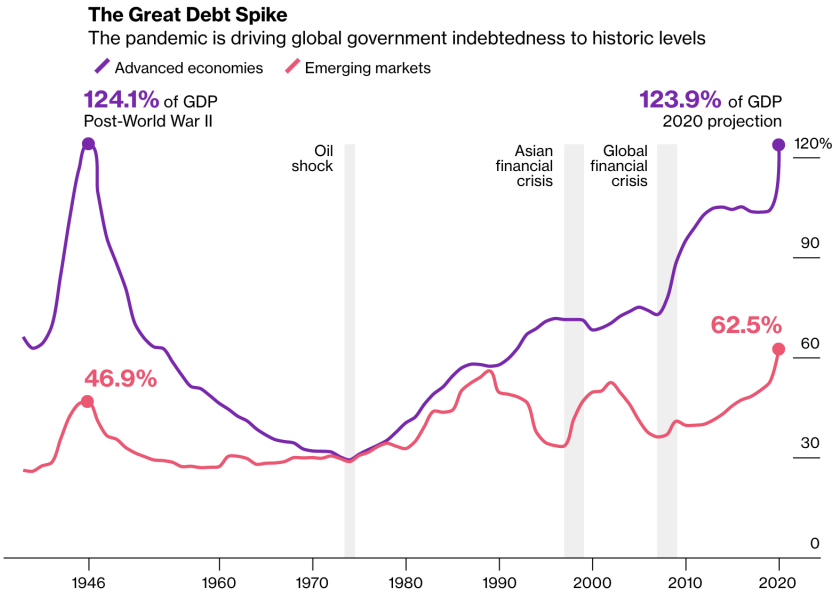
$$B_{t+1} - B_t = S_t - I_t - CA_t. \tag{1}$$

Hence, any increase in the budget deficit must be matched by an increase in private saving, a decline in investment, or a decline in the current account. For instance, so far in the United States, comparing the year before March 2020 to the year after, the fiscal deficit increased by \$2.5 trillion, private savings rose by \$2.2 trillion, investment declined by \$250 billion, and the current account deficit increased by \$210 billion (Table 1). Was this macroeconomic response to be expected? What are the likely dynamics going forward?

One question of particular interest is the pass-through from the fiscal deficit to the current account deficit. The data from table 1 suggests a one-year pass-through of about 8% from the recent fiscal expansion. We also know that this fiscal expansion mostly financed transfers to households and firms, and that its effect on the debt-to-GDP ratio is expected to be permanent (IMF 2021).

A standard representative agent model would predict a 0% pass-through, with Ricardian equivalence implying that private savings fully offset the fiscal deficit. By contrast, standard rules of thumb used by the IMF and other policy institutions, inspired by a very

*Stanford University, CEPR and NBER. Email: aauclert@stanford.edu.
†Northwestern University and NBER. Email: matthew.rognlie@northwestern.edu.
‡Harvard University and NBER. Email: ludwigstraub@fas.harvard.edu.




Source: https://www.bloomberg.com/graphics/2021-coronavirus-global-debt/

Figure 1: Public debt increases in advanced and emerging economies

large empirical literature studying the relationship between fiscal and current account deficits (e.g. Chinn and Prasad 2003), embrace a "twin deficit" view with pass-throughs on the order of 30%-50%. By both standards, the recent US experience—featuring small but non-zero pass-through—appears puzzling.[1]

In this paper, we propose to spell out the dynamic implications of models with *non-Ricardian agents* and *imperfectly integrated goods markets* for the macroeconomic response to increases in fiscal transfers financed by permanent increases in debt. We will show that these models:

a) can rationalize the U.S. and other countries' recent experience of relatively limited short-run pass-through, and

b) have much larger pass-through coefficients in the long run, with increases in debt leading to essentially equal long-run declines in net foreign asset positions.

An important message for policymakers is that even if twin deficits seem subdued at the moment, they will emerge in force in the long run: countries that have expanded their

[1]For instance, in recent tweets, Jason Furman has expressed puzzlement that the U.S. current account deficit did not expand more in the face of large fiscal deficits: see https://twitter.com/jasonfurman/status/1440315145918447631 and https://twitter.com/jasonfurman/status/1440397123099324422. On the other hand, while we think few economists would seriously argue for the strict Ricardian view, it remains a dominant framework in international macro modeling today.

| USD $bn | Budget deficit $B_{t+1} - B_t$ | Private savings $S_t$ | Investment $I_t$ | Current account deficit $-CA_t$ |
|---|---|---|---|---|
| 2019Q2-2020Q1 | 1224 | 1944 | 1094 | 463 |
| 2020Q2-2021Q1 | 3736 | 4138 | 848 | 675 |
| Difference | 2512 | 2194 | -246 | 212 |

Source: FRED. The difference $B_{t+1} - B_t - (S_t - I_t - CA_t)$ is the statistical discrepancy.

Table 1: Components of (1) in the U.S. before and after covid

debt by more than the rest of the world will likely see a commensurate deterioration in their long-run international positions.

To understand the basic intuition, it is instructive to consider the case of a small open economy, integrated into world financial markets but with home bias in goods markets. In the steady state, a permanent increase in debt does not change the real interest rate, so capital is unchanged and so are pre-tax incomes. To the extent that $r \simeq g$, so that the budgetary cost of the increase in debt is minimal, taxes and therefore post-tax incomes are also unchanged. Hence, households hold the same amount of wealth in the long run as they did before the increase in debt. It follows that the rise in debt must be permanently offset by a decline in the country's net foreign asset position—the long-run pass-through is 1. Hence, along the transition there must be a sequence of current account deficits that get us there.

These current account deficits, however, involve a decline in net exports. Consider the very short run, and suppose first that the real exchange rate does not move. For every \$100 of transfers that households get, they spend $MPC \times \$100$ on goods overall, but with homothetic preferences and in the absence of any real exchange rate movement, they only spend $\alpha \times MPC \times \$100$ on imports, where $\alpha$ is the ratio of imports in total spending. Meanwhile exports are unchanged, and so the partial equilibrium pass-through coefficient is only $\alpha \times MPC$. In the US, where $\alpha \simeq 0.15$, even with an annual $MPC \simeq 0.5$, this logic suggests a one year pass-through coefficient of only $\sim 8\%$. Of course, this partial equilibrium logic is incomplete—monetary policy, exchange rates, and incomes will move—but this argument illustrates why limited goods market openness and moderate MPCs make the short-run pass-through of fiscal to current account deficits much smaller than what is commonly assumed in the policy literature.

The general equilibrium model we plan to use is a fiscal policy extension of Auclert, Rognlie, Souchier and Straub (2021), where we embedded the Galí and Monacelli (2005) model into a standard HANK framework a la McKay and Reis (2016), McKay, Nakamura and Steinsson (2016) and Kaplan, Moll and Violante (2018). We believe this paper would

be the first study of fiscal policy in an open-economy HANK model. In Auclert, Rognlie and Straub (2018), we studied fiscal policy in a closed-economy HANK model.

## 2 Existing literature

There are large policy, empirical, and theoretical literatures on twin deficits.

On the policy side, the idea of twin deficits is often traced back to Feldstein (Feldstein 1993), who argued that this phenomenon characterized the 1980s US data well, though he claims he did not invent the term. See Ball and Mankiw (1995) for a policy-oriented review.

On the empirical side, it is well known that twin deficits are difficult to clearly detect in the data, since other shocks push in the opposite direction (for instance, a business cycle boom typically is associated with a current account deficit as import demand rises, as well as a fiscal surplus due to higher tax revenue and reduced transfer payments). Hence, simple time series can show episodes of twin deficits such as those of the 1980s, or "twin divergence" such as during the Clinton era of budget surplus and current account deficit (Kim and Roubini 2008). Nevertheless, papers from Bernheim (1988) to Chinn and Prasad (2003) and Chinn and Ito (2007) have tended to find short-run twin deficit pass-through coefficients on the order of 0.3 to 0.5, and this appears to be the dominant rule-of-thumb in policy discussions. More recent work using identified tax shocks (Feyrer and Shambaugh 2012) reaches similar conclusions.

On the theory side, some papers have studied twin deficits in Ricardian models when deficits finance government spending rather than transfers (Corsetti and Müller 2006). The seminal study of the relationship between fiscal deficits and current account deficits in a non-Ricardian model is Blanchard (1985). That paper has a very tractable perpetual youth OLG structure, but assumes perfectly integrated goods markets, so that the short-run partial equilibrium pass-through coefficient is $MPC$ rather than $\alpha \times MPC$—which can make a quantitatively very large difference for a relatively closed economy like the United States. The Blanchard model has since been embedded into "new open economy macro models" with imperfectly integrated goods markets, first by Ghironi (2006), and more recently by Kumhof and Laxton (2013), who study the implications for twin deficits and report short-run pass-through of 0.5.[2] We plan to compare and contrast the predictions of our HANK model with the Blanchard model and its descendants, and we conjecture that

[2]We conjecture that Kumhof and Laxton (2013), who apply a streamlined version of the "GIMF" model in use at the IMF today, obtain this high short-run pass-through because they study permanent shocks to deficits rather than debt, so that these these shocks take decades to have their full effect on debt/GDP.

when the Blanchard model is appropriately calibrated, there will be many similarities.

# 3 Paper structure

We envision the paper in three parts. Depending on what makes the most sense, we could flip the order of the empirical and the theory sections.

### Part 1. Empirical evidence

This section will review the covid evidence on the short-run pass-through from fiscal deficits to current account deficits, producing estimates for a range of countries. We also plan to replicate earlier studies like Chinn and Prasad (2003) and Feyrer and Shambaugh (2012), seeing how the theory can help interpret their regression coefficients or suggest alternative empirical specifications, and stressing the identification challenges.

### Part 2. Small open economy model

This section will set up a small open economy HANK model and discuss its implications for the twin deficits relationship.

The setting is similar to Auclert et al. (2021), but with a government added to the model. The economy is infinitesimally small, fully open to capital markets, and agents have home bias so goods markets are partially segmented. There are nominal rigidities in wages and prices are fully flexible (i.e "producer-currency pricing").

We will consider several models of household behavior. Our main focus will be on the representative agent (RA) model, the two agent (TA) model, the heterogeneous-agent (HA) model, and the Blanchard (1985)–type perpetual youth OLG model. In all cases, the government collects labor income taxes $\tau_t$ on wage income $w_t N_t$, spends $G_t$ on domestically produced goods and $T_t$ on lump-sum transfers to agents, and issues short-term debt $B_t$ with interest rate $r_t$. The dynamics of debt are given by

$$\frac{P_{Ht}}{P_t} G_t + T_t + (1 + r_{t-1}) B_{t-1} = \tau_t w_t N_t + B_t \tag{2}$$

where $P_{Ht}$ is the price of domestically-produced goods and $P_t$ the consumer price index. We focus on the effect of a change in the time path of debt $B_t$, while adjusting transfers $T_t$.

We will consider a permanent increase in debt. There are three questions of interest:

1) How much of the debt is held abroad in the long run?

2) How fast does this happen?

3) What are the means of absorption?

As discussed above, the RA model implies no effect on the current account. The answer to 1) is 0%, and so the answers to 2) and 3) are uninteresting.

By contrast, the HA and OLG models imply that 100% of the debt is held abroad in the long run. The answer to 2) depends on the degree of goods market openness. For 3), there are two main mechanisms: an *expenditure switching effect*, and a *demand effect*. The answer to 3) depends on goods market openness, export elasticities, and the monetary policy response. The TA model is similar but predicts that the current account deficit happens exactly at the same time as the fiscal deficit.

We will proceed to studying the dynamics of the shock under various monetary policy rules. Figure 2 displays these dynamics. When monetary policy holds the real interest rate and therefore the real exchange rate constant, there is a large and persistent boom, with consumption rising more than output, so that the current account deficit falls, but not by much initially. When monetary policy tightens in reaction, the real exchange rate appreciates and the initial response of the current account deficit is larger. In all cases, the

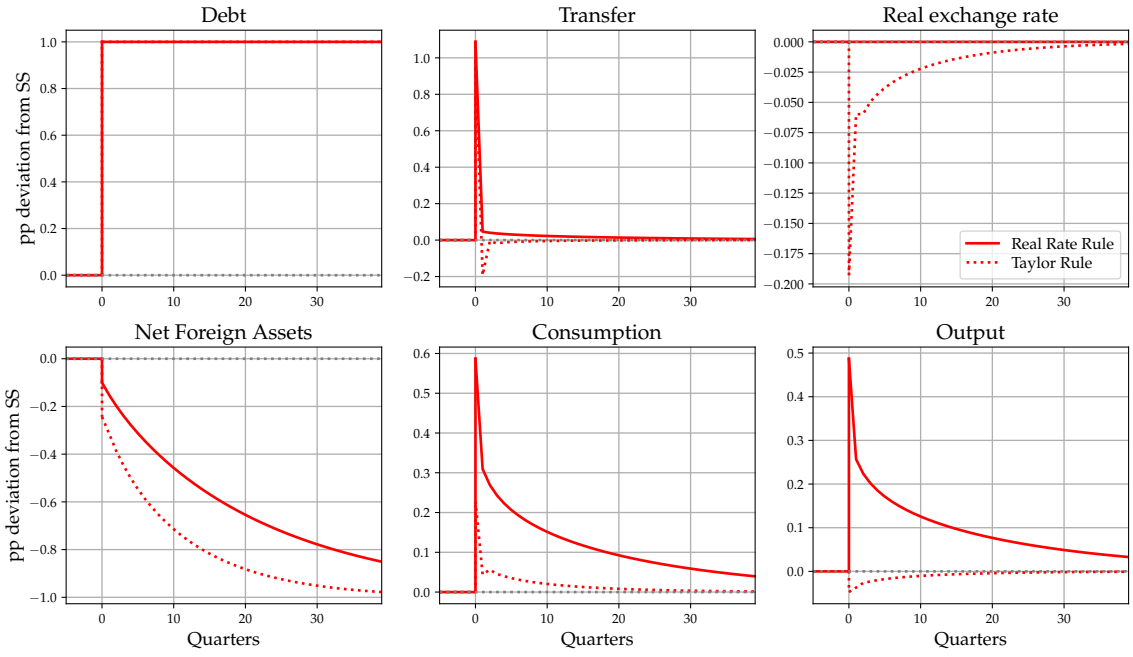



Figure 2: Impulse response to a permanent debt shock financing transfers under various monetary policy responses

convergence is to a negative NFA that mirrors the debt increase, as explained earlier. We will study what openness, export elasticities and the strength of the Taylor rule response imply for the speed of convergence. We also plan to develop a series of additional analytical results about fiscal policy in this model that we think will be helpful for the literature going forward.

## Part 3. Extensions

The baseline model with no frictions to international capital mobility has simple and stark implications that differ from existing representative-agent models, but it remains a little unrealistic. For instance, there is no effect of government debt issuance on interest rates, and all debt is always held entirely abroad in the long run. In practice, there are convenience yields on government debt that seem to be influenced by the amount of domestic debt outstanding (see e.g. Krishnamurthy and Vissing-Jorgensen 2012 and the literature that followed). Here we propose to relax the small open economy assumption, spell out the testable implications of these extensions, and confront these implications to the data.

### 3.1 Large countries

When countries are large with respect to the rest of the world, government debt expansions have an effect on the world interest rate. Moreover, if all countries expand debt simultaneously (as has happened recently), then it is the policy of the country *relative to the average of the rest of the world* that matters for its NFA. So the model predicts that countries that have expanded debt the most are those that should see the largest deterioration of their NFA, and that this process should happen gradually.

### 3.2 Frictional capital markets

When there are UIP deviations modeled a la Gabaix and Maggiori (2015), government debt expansions put pressure on the domestic interest rate for a given expected rate of currency appreciation. This also limits the extent to which governments can issue debt, and we can test this mechanism with empirical evidence on convenience yields.

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