ASECU South-Eastern Europe Journal of Economics 2 (2020) 139-157 SEEJE

ARE "TWIN DEFICITS" AN ILLUSION? INTERNATIONAL EVIDENCE ON FISCAL POLICY AND THE CURRENT ACCOUNT

GEORGIOS KARRAS*
University of Illinois at Chicago

Abstract
The "Twin Deficits" hypothesis predicts that the current account responds to changes in the budget deficit, whether these are coming from changes in government spending or taxes. On the contrary, the "Fundamental Current Account Equation" of the intertemporal approach predicts that the current account responds only to (temporary) changes in government spending but not to taxes. Using annual data from 1870 to 2013 for a panel of seven OECD economies, the paper finds that (i) budget and current account deficits move together, which is necessary but not sufficient for the Twin Deficits hypothesis to hold; (ii) temporary increases in government spending deteriorate the current account balance, as predicted by the Fundamental Equation hypothesis; and (iii) changes in the budget deficit, other than temporary changes in government spending, also reduce the current account balance, suggesting that Twin Deficits are not an illusion. Quantitatively, an increase in temporary government spending by 1% of GDP deteriorates the current account by a maximum of 0.20% of GDP, whereas an increase in temporary taxes by 1% of GDP improves the current account by a maximum of 0.50% of GDP.

JEL Classification: E62, F41
Keywords: Budget Deficit, Current Account Balance, Twin Deficits, Fundamental Current Account Equation

I wish to thank participants at the 15th International WEAI Conference in Tokyo, and seminar participants at the Department of Economics, University of Wisconsin-Milwaukee for helpful comments and suggestions. Errors and omissions remain mine.

Corresponding Address:* **Georgios KARRAS, Professor of Economics, University of Illinois at Chicago, Department of Economics, 601 S. Morgan St., Chicago, IL 606077121.
E-mail: gkarras@uic.edu.

1. Introduction

The Covid-19 public health emergency has reinforced the trend begun with the global financial crisis towards extraordinary fiscal intervention combined with near-zero interest rates[1]. This macroeconomic policy mix has revitalized interest in the relationship between the government budget and the current account. There is widespread consensus that the two should move together, often characterized as the "twin deficits" hypothesis. The popularity of the hypothesis is explained by evidence such as the recent US experience, where an unprecedented peacetime fiscal stimulus worth 12% of GDP has coincided with the largest trade deficit in 14 years[2].

Theoretically, however, the precise nature of the relationship between the two balances is less straightforward. The strongest version of "twin deficits", suggested by simple open-economy national income accounting, is that the deficits in the government budget and the current account have an exact one-to-one relationship;however, this rests on unrealistic assumptions about the behavior of private saving and investment. When these assumptions are relaxed, as in the Mundell-Fleming model or the "fundamental current account equation" intertemporal approach, the budget deficit is shown to influence the current account in more complex and varying ways. As shown in section 2 below, the theoretical consensus is quite fragile.

Therefore, the precise nature of the relationship between the two balances needs to be resolved empirically, and a very large literature has developed on the subject, utilizing different data sets and econometric techniques. Recent examples include Corsetti and Müller (2006), Kim and Roubini (2008), Bluedorn and Leigh (2011), IMF (2011), Forte and Magazzino (2013), Eldemerdash, Metcalf, and Maioli (2014), Auerbach and Gorodnichenko (2016), Forni and Gambetti (2016), and Karras (2019). While results differ widely, a broad consensus appears to be that increases in budget deficits do worsen the current account balance, but less than one-to-one. Focusing on the influential IMF (2011) study, for example, a fiscal consolidation of 1% of GDP is found to improve the current account balance by a little more than 0.5% of GDP, and the effect is found to be permanent.

The goal of the present paper is to revisit this relationship, aiming at distinguishing between the "twin deficit" and "fundamental current account equation" approaches. The paper also relies on a unique data set of seven countries over the period 1870-2013. The main advantage of using such a long data set is that it includes a variety of government budget and current account experiences that are not typically (or not at all) found in more commonly used post-World War II data sets.

1. See IMF (2020), OECD (2020), World Bank (2020).

2. The Economist (October 20, 2020).

Our first finding is that a version of the "twin deficits" hypothesis is indeed supported by the data. A change in the budget deficit moves the current account in the opposite direction, though by less than one-to-one (about a quarter-to-one). The effect is shown to be persistent but temporary, peaking about three years after the shock, and dying out after a maximum of ten years. However, we find a similar result if the budget deficit is replaced by temporary changes in government spending, as predicted by the "fundamental current account equation". Because the budget deficit is highly positively correlated with temporary increases in government spending, empirical models such as these cannot distinguish between the two theories.

Next, we move to the paper's central contribution, which is to develop models that identify the current account effects of temporary government spending separately from those of other components of the budget deficit (including temporary taxes). The results are instructive. While, as predicted by the "fundamental current account equation", temporary government spending clearly affects the current account, so does the rest of the budget deficit (including temporary taxes) as well, implying that "twin deficits" are not an illusion. The estimated models can be used to quantify these effects and how they evolve over time.

The rest of the paper is organized as follows. Section 2 discusses the conceptual framework, presents the data, and defines the variables to be used in the estimation. Section 3 outlines the estimation methodology, derives the main empirical results, and implements a number of robustness checks. Section 4 discusses the findings and concludes.

2. Conceptual Framework

This section discusses three of the most widely used theoretical approaches which have clear, though differing, implications about the relationship between the balances of the current account and the government budget.

The first, and probably the simplest, is the open-economy national accounting identity, $CA \equiv S\text{-}I$, which says that the current account balance (CA) equals the difference between national saving (S) and domestic investment (I). National saving is the sum of private saving (S_P) and government saving (S_G):$S = S_P + S_G$. Defining government saving as the difference between net tax revenue (T) and government spending (G), we have $S_G = T\text{-}G$, which is just the government budget surplus. Substituting in the current account identity, we get $CA \equiv S_P\text{-}I\text{-}(G\text{-}T)$, which is the origin of the "twin" deficits hypothesis: *given private saving and investment*, there should be an exact one-to-one relationship between the budget deficit and the current account deficit. In other words, $\frac{\partial(-CA)}{\partial(G-T)} = 1$. An increase in *(G-T)* by \$*x* will be accompanied by a decrease in *CA* by exactly \$*x*. Moreover, it makes no difference whether the increase in *(G-T)* comes from a higher *G* or a lower *T*: under the assumptions stated above, the *CA* effects would be the same. Under these assumptions, the two deficits are "twins". Of course, what makes the "twin deficits" hypothesis a very special case is that, realistically, neither private saving nor investment are likely to be unaffected by fiscal policy changes. The next two theoretical frameworks address this in two very different ways.

The second approach we consider is a simple version of the Mundell-Fleming model, based on standard Keynesian consumption and import functions. As is well known, this implies $\frac{\partial CA}{\partial G} < 0$ and $\frac{\partial CA}{\partial T} > 0$, so that $\frac{\partial(-CA)}{\partial(G-T)} > 0$. Once again, the budget and current-account deficits are (almost) twins: they move in the same direction, though not necessarily one-to-one. Note again that the relationship applies both to changes in *G* and changes in *T*.

The third and final framework we consider is the simplest version of the "intertemporal approach" to the current account. The representative individual's objective at time *t* is to maximize $\sum_{j=0}^{\infty}(1+\rho)^{-j}u(C_{t+j})$, where *C* is consumption, ρ is the subjective rate of time preference, and the utility function satisfies $u' > 0$ and $u'' < 0$. Using *B* for beginning-of-period net foreign assets, *Y* for GDP, and *r* for the real interest rate, the open economy's budget constraint is $B_{t+1} - B_t = Y_t + rB_t - C_t - G_t - I_t$[3]. Obstfeld and Rogoff (1996) show that the first-order conditions imply consumption smoothing and, under the simplifying assumption $\rho = r$, the exact "fundamental current account equation": $CA_t = (Y_t - \tilde{Y}_t) - (I_t - \tilde{I}_t) - (G_t - \tilde{G}_t)$, where $\tilde{X}_t$ denotes the permanent component of variable X_t.[4]

The "fundamental current account equation" above implies thatincreases in *G* will affect the current account only to the extent they are temporary: optimizing consumers will try to reduce consumption by a smaller amount (or leave it unaffected if $\tilde{G}_t$ is not altered at all), necessitating more borrowing from abroad and thus a deterioration in the current account: $\frac{\partial(-CA)}{\partial(G_t-\tilde{G}_t)} > 0$. Permanent changes in *G*, however, will cause consumption to move in the opposite direction by exactly the same amount, so the current account will be unaffected: $\frac{\partial(-CA)}{\partial\tilde{G}_t} = 0$. In addition, and most importantly for our purposes here, changes in taxes are completely irrelevant for the determination of the current account: *given the "fundamentals"* in the right-hand side of the equation, changing taxes has no effect on the current account balance (consumers are subject to Ricardian Equivalence)[5].

3. Note that $Y_t + rB_t = GNP_t$, so $Y_t + rB_t - C_t - G_t - I_t = S_t - I_t$, and because $B_{t+1} - B_t = CA_t$, the budget constraint is equivalent to $CA = S - I$.

4. Specifically, $\tilde{X}_t = \frac{r}{1+r}\sum_{j=0}^{\infty}(1+r)^{-j}X_{t+j}$.

5. Of course, just like the strict "twin deficits" hypothesis, the simple "fundamental equation" is also a special case. Obstfeld and Rogoff (1996) show that in more realistic theoretical settings, where consumers are not necessarily Ricardian, government budget deficits will induce current account deficits, so the two will continue to move together, though their relationship will not necessarily be one-to-one. The related theoretical literature is vast, and the theoretical predictions vary considerably. For example, Erceg, Guerrieri, and Gust (2005) develop a dynamic general equilibrium model which predicts that a rise in the fiscal deficit by 1% of GDP would deteriorate the trade balance by 0.2% of GDP or less. On the other hand, Roubini (1988) shows that if both consumption smoothing and tax smoothing apply, the theoretical relationship between the budget and current account deficits should be one-to-one (the strong version of the "twin" result).

This raises the possibility that "twin deficit" empirical findings are an illusion, in the following sense. Suppose the "fundamental current account equation" is correct and fiscal policy affects the current account only when government spending goes up temporarily. Because temporary increases in G tend to coincide with budget deficits (as we will see in the next section, the two variables are highly positively correlated), one would (correctly) conclude that such deficits deteriorate the current account,but then (erroneously) decide that this confirms the "twin deficits" hypothesis and (again erroneously) infer that changes in both G and T influence CA.

The implication is that establishing an empirical relationship between the budget deficit, G - T, and the current account balance, CA, is necessary but not sufficient evidence in favor of the "twin deficits" hypothesis. The reason is that such a relationship would obtain even if the "twin deficits" hypothesis was false, but other economic conditions, such as the "fundamental equation", applied.

Therefore, to convincingly test the "twin deficits" hypothesis, one needs to show that elements of the budget deficit *other than the temporary component of government spending*, can also affect the current account balance in the predicted direction. This is the task of the empirical part of this paper.

3. Data

All data are from the Jordà-Schularick-Taylor Macrohistory Database (see Jordà, Schularick, and Taylor, 2017). Using i to index over countries and t over time, the current account balance as percent of GDP is simply defined as $ca_{i,t} = \frac{CA_{i,t}}{GDP_{i,t}} \cdot 100$, where $CA_{i,t}$ is the reported current account balance (nominal, local currency), and $GDP_{i,t}$ is Gross Domestic Product (nominal, local currency). Similarly, the government budget deficit as percent of GDP is defined as $d_{it} = \frac{G_{i,t}-T_{i,t}}{GDP_{i,t}} \cdot 100$, where $G_{i,t}$ is government expenditure (nominal, local currency), and $T_{i,t}$ is government revenues (nominal, local currency).

The data set consists of annual observations covering the period 1870 – 2013 for each of the following seven countries, for which complete time series are available: Canada, Switzerland, Great Britain, Italy, Portugal, Sweden, and the US.

To incorporate the predictions of the intertemporal approach, we rewrite the budget deficit as $d_{i,t} = g_{i,t} - \tau_{i,t}$, where $g_{i,t} = \frac{G_{i,t}}{GDP_{i,t}} \cdot 100$ and $\tau_{i,t} = \frac{T_{i,t}}{GDP_{i,t}} \cdot 100$. We then use the Hodrick-Prescott (HP) filter, proposed by Hodrick and Prescott (1997), to decompose g and τ into permanent ($\tilde{g}$ and $\tilde{\tau}$) and transitory ($\hat{g}$ and $\hat{\tau}$) components[6].

6. In particular, for a series x_t, the HP filter defines the permanent component, $\tilde{x}_t$, as the one that minimizes $\sum_{t=1}^{T}(x_t - \tilde{x}_t)^2 + \lambda \sum_{t=2}^{T-1}[(\tilde{x}_{t+1} - \tilde{x}_t) - (\tilde{x}_t - \tilde{x}_{t-1})]^2$ for $\lambda > 0$. In the empirical section below we report results for $\lambda = 100$, the value suggested by Hodrick and Prescott for annual data, but we have also tried $\lambda = 6.25$, as recommended by Ravn and Uhlig (2002). The temporary component is then $\hat{x}_t = x_t - \tilde{x}_t$.

Figures A1 and A2 in the Appendix illustrate the decompositions[7].

Figure 1 plots the budget deficit, $d_{i,t}$, and the current account balance, $ca_{i,t}$, for each of the seven countries over the entire period. Figure 2 repeats the exercise for temporary government spending ($\hat{g}_{i,t}$) and $ca_{i,t}$. Figures 1and 2 clearly show the generally inverse relationship between the current account and both of the other variables: increasing budget deficits or temporary government expansions tend to coincide with deteriorating current account balances, while diminishing budget deficits or reductions in temporary government spending tend to overlap with improving current account balances.

Visually, therefore, the majority of episodes appear to be qualitatively consistent with both the "twin deficits"and the "fundamental equation" hypotheses. The most striking examples include the sizable World War I and World War II fiscal expansions which were accompanied by current account deteriorations in most countries. Even peace-time current account balances, however, usually move *in the opposite* direction from budget deficits or temporary government increases (such as in Italy and Portugal in the 1970s, or Sweden and the US in the 1980s), as dictated by the "twin deficits" and "fundamental equation" hypotheses[8].

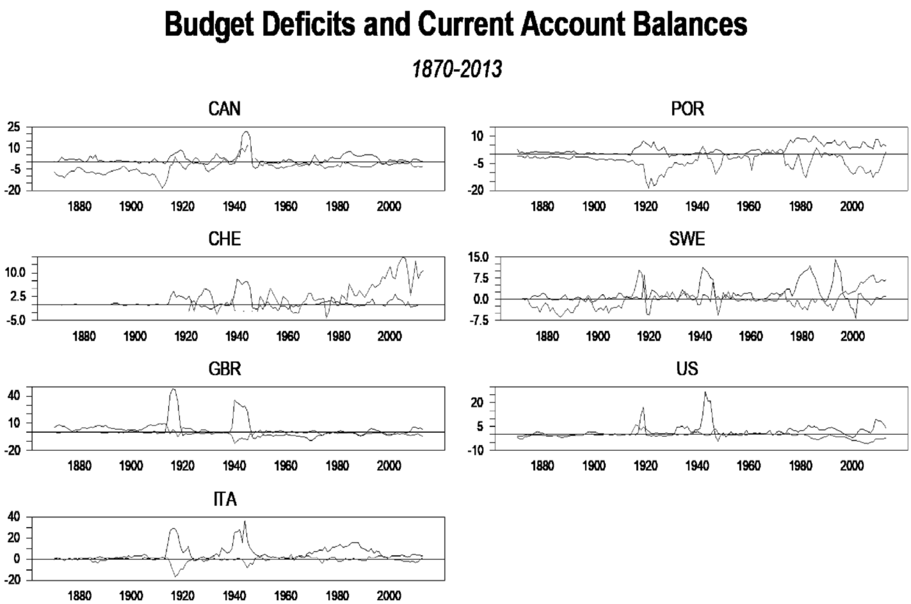

Figure 1. Government Budget Deficits (black lines) and Current Account Balances (blue lines) as percent of GDP.

7. The filters proposed by Baxter and King (1999) and Christiano and Fitzgerald (2003) were also used for the decomposition, with very similar results.

8. Nevertheless, exceptions are also easy to identify (as in Switzerland in the 1990s and Portugal in the 2000s), when budget deficits (or temporary government expansions) and current account balances moved *in the same* direction, contrary to the "twin deficit" and "fundamental equation" hypothesis. This is another reason why the formal testing of the next section is necessary.

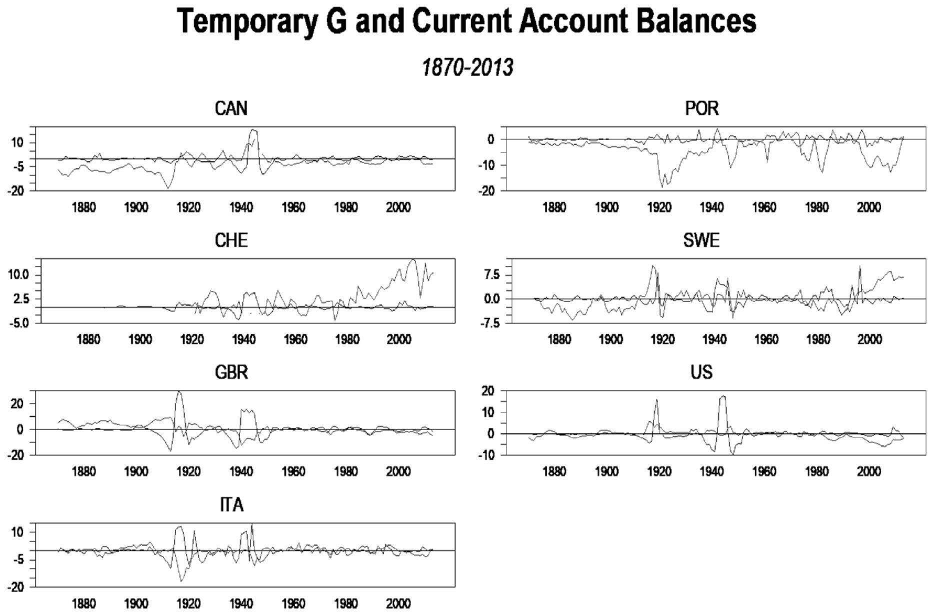

Figure 2. Temporary Government Spending (black lines) and Current Account Balances (blue lines) as percent of GDP.

Summing up, the visual evidence is potentially consistent with both the "twin deficits" and the "fundamental equation" hypotheses – as a result, it is unable to distinguish between the two.

The first objective of the next section is to show that the same ambiguity obtains if we formally test these relationships separately (as in most of the literature). The second objective is to go beyond the ambiguous evidence by estimating nested models that can be used to unambiguously distinguish between the two competing explanations.

3. Empirical Evidence

This section presents the paper's empirical evidence. Section 3.1 tests the relationship between the budget deficit and the current account balance. Section 3.2 investigates the relationship between temporary government spending and the current account. Section 3.3 presents a nested model, and section 3.4 an additional extension for robustness.

3.1 The Two Deficits

We start with a simple dynamic relationship that estimates the responses of the current account balance to changes in the government budget deficit. Using the local projection method of Jordà (2005), the basic specification is:

$$ca_{i,t+h} = w_i^h + v_t^h + \theta^h \Delta d_{i,t} + \sum_{j=1}^{J} \theta_j^h \Delta d_{i,t-j} + \sum_{j=1}^{J} \alpha_j^h ca_{i,t-j} + u_{i,t} \quad (1)$$

where i is indexing over countries and t over time; h indicates the horizon (years after time t) considered; the *w*s and *v*s are, respectively, country- and time-specific fixed (or random) effects; and the αs and θs are parameters to be estimated. The desired impulse response function consists of the estimated θ^hs, which capture the dynamic responses of the current account balance to a change in the budget deficit.

Table 1 and Figures 3 and 4 present the impulse response functions estimated with fixed or random effects. Beginning with the fixed-effects estimates (Figure 3 and top row of Table 1), an increase in the budget deficit by 1% of GDP is found to reduce the current account balance contemporaneously (i.e., within the year) by 0.12% of GDP. This impact is modest, but statistically significant. One year later, however, the deterioration in the current account is much larger, at 0.26% of GDP (and statistically significant). The current account effect then gradually declines in (absolute) size, but remains statistically significantly negative even for the sixth year after the shock. By the tenth year after the increase in the budget deficit, however, the current account response has effectively died out – both economically and statistically. The random effect estimates (Figure 4 and second row of Table 1) paint a very similar picture, so the results appear to be robust to the modeling of the country-specific and time-specific effects.

Table 1. Responses of the Current Account to the Budget Deficit

	Horizons (in years)				maximum	
	0	1	5	10	response	year
Fixed Effects	–0.118** (0.025)	–0.256** (0.035)	–0.121* (0.049)	–0.036 (0.053)	–0.279** (0.044)	3
Random Effects	–0.086** (0.022)	–0.166** (0.030)	–0.119** (0.038)	–0.000 (0.039)	–0.189** (0.037)	3

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Budget Deficit by 1% of GDP. Estimated standard errors in parentheses. '**' and '*' denote statistical significance at the 1% and 5% significance levels.

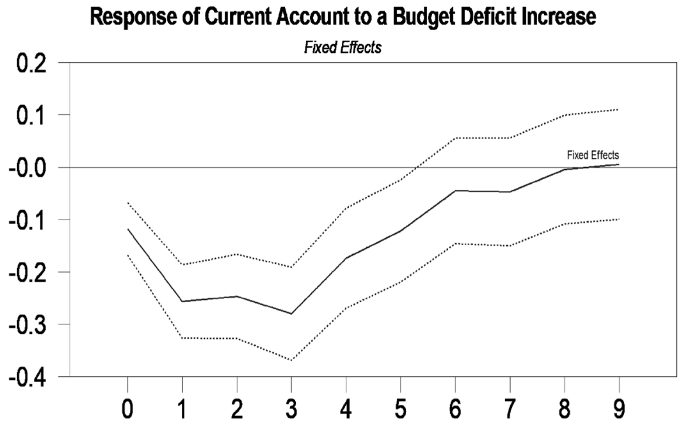

Figure 3

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Budget Deficit by 1% of GDP. Model estimated over1870-2013 with country and time fixed effects. Dashed lines are two-standard-error confidence intervals.

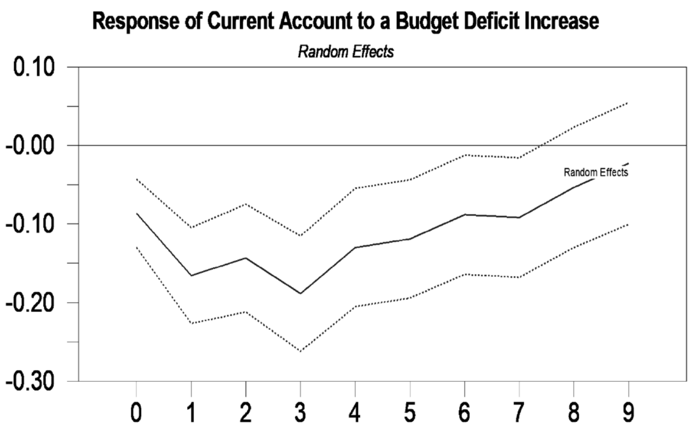

Figure 4

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Budget Deficit by 1% of GDP. Model estimated over 1870-2013 with country and time random effects. Dashed lines are two-standard-error confidence intervals.

Overall, the evidence suggests that the response of the current account balance to the budget deficit is inverse-hump-shaped: an increase in the budget deficit results in a current account deterioration that is sizeable though less than one-to-one, and persistent but temporary.

We now turn to an investigation of the mechanisms that are generating this relationship.

3.2 Temporary Government Spending

Pursuing now the "fundamental current account equation" perspective, the next model allows the current account to respond only to temporary changes in government spending.Using again the local projection method (Jordà, 2005), the specification becomes:

$$ca_{i,t+h} = w_i^h + v_t^h + \beta^h \Delta\hat{g}_{i,t} + \sum_{j=1}^{J} \beta_j^h \Delta\hat{g}_{i,t-j} + \sum_{j=1}^{J} \alpha_j^h ca_{i,t-j} + u_{i,t} \quad (2)$$

where notation is as in (1), and now the αs and βs are parameters to be estimated. The desired impulse response function consists of the estimated β^hs, which capture the dynamic responses of the current account balance to a change in the temporary component of government spending, $\hat{g}$.

Table 2 and Figures 5 and 6 present the estimated impulse response functions. The most remarkable thing about these estimates is how similar they are to the ones from model (1). Looking at the fixed-effects estimates for example (Figure 5 and top row of Table 2), an increase in temporary government spending by 1% of GDP reduces the current account balanceby 0.11% of GDP contemporaneously (i.e., within the year), and by 0.19% of GDP one year later (both statistically significant). The effect then gradually declines, eventually becoming economically and statistically insignificant. The random effect estimates (Figure 6 and second row of Table 2) tell the same story, with minor quantitative differences (such as the maximum effect occurring three years out), so the results are again robust across the specifications.

Table 2. Responses of the Current Account to Temporary Government Spending

	Horizons (in years)				maximum	
	0	1	5	10	response	year
Fixed Effects	–0.110**	–0.189**	–0.028	–0.001	–0.189**	1
	(0.027)	(0.038)	(0.051)	(0.055)	(0.038)	
Random Effects	–0.084**	–0.108**	–0.084*	0.040	–0.148**	3
	(0.023)	(0.032)	(0.040)	(0.041)	(0.039)	

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Temporary component of Government Spending by 1% of GDP. Estimated standard errors in parentheses. '**' and '*' denote statistical significance at the 1% and 5% significance levels.

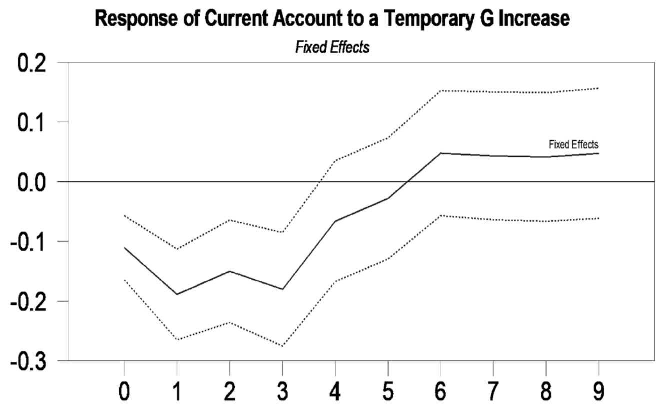

Figure 5

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Temporary component of Government Spending by 1% of GDP. Model estimated over 1870-2013 with country and time fixed effects. Dashed lines are two-standard-error confidence intervals.

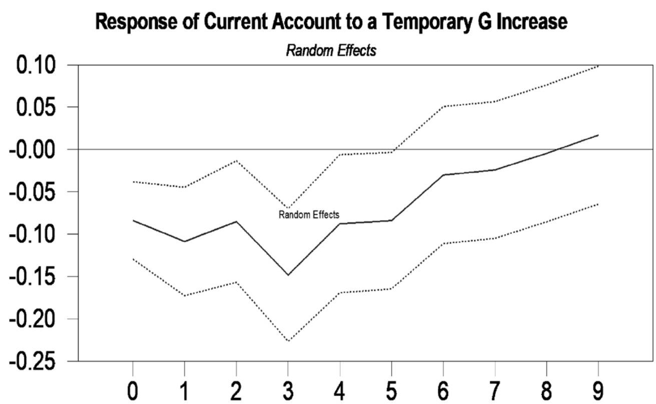

Figure 6

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the Temporary component of Government Spending by 1% of GDP. Model estimated over 1870-2013 with country and time random effects. Dashed lines are two-standard-error confidence intervals.

This evidence is obviously consistent with the predictions of the "fundamental current account equation". In addition, however, it casts doubt on the "twin deficits" interpretation of the observed relationship between the two balances. We will return to this in the next section, but it is worthwhile first to ask: Why are the results of models (1) and (2) so similar? The answer is simple: the overall budget deficit and the temporary component of government spending are strongly positively correlated. Table A1 in the Appendix shows this to be the case both for the levels and first differences of the two series, and for all of the countries in our sample. This is not surprising of course: periods of temporarily high government spending are naturally periods of deficit financing, as implied by the "tax smoothing" hypothesis (Barro, 1979). The implication for our empirical strategy is obvious. Models (1) and (2) do not suffice to distinguish between the "twin deficit" and "fundamental current account equation" explanations of the observed relationship. To achieve this, we next turn to a richer model.

3.3 A Nested Model

To shed light on the validity of the two competing frameworks, we estimate a model that allows the current account to be affected differently by temporary government spending than by other components of the budget deficit. Specifically, let $nd_{i,t} = d_{i,t} - \hat{g}_{i,t}$ denote the *net deficit* (deficit net of temporary government spending), and consider the local projection model:

$$ca_{i,t+h} = w_i^h + v_t^h + \beta^h \Delta\hat{g}_{i,t} + \sum_{j=1}^{J} \beta_j^h \Delta\hat{g}_{i,t-j}$$

$$+\delta^h \Delta nd_{i,t} + \sum_{j=1}^{J} \delta_j^h \Delta nd_{i,t-j} + \sum_{j=1}^{J} \alpha_j^h ca_{i,t-j} + u_{i,t} \quad (3)$$

where notation is standard, and now the αs, βs, and δs are parameters to be estimated. There are now two impulse response functions that are of interest: (i) the estimated β^hs, which capture the dynamic responses of the current account balance to a change in the temporary component of government spending, $\hat{g}$, and (ii) the estimated δ^hs, which capture the responses to a change in the net deficit, i.e., any component of the budget deficit other than temporary government spending, $\hat{g}$. In simple terms, the "fundamental current account equation" predicts $\beta^h < 0$ and $\delta^h = 0$, whereas the two deficits can be characterized as "twins" if $\delta^h < 0$, so that the relationship holds even when the change in the budget balance does not come from the temporary component of government spending.

Table 3 and Figure 7 report the results from model (3). The most crucial finding for your purposes is that *both* temporary government spending and the net deficit are shown to deteriorate the current account balance. In fact, the two responses are qualitatively similar to each other, and to the results of the previous two Tables. For example, the fixed-effects estimates (the two left panels of Figure 7, and the two top rows of Table 3), estimate that an increase in temporary government spending (net deficit) by 1% of GDP reduces the current account balanceby 0.1% (0.14%) of GDP within the year, and by 0.2% (0.43%) of GDP one year later (both statistically significant). Both effects then gradually decay, eventually becoming economically and statistically insignificant. The random effect estimates (in the two right panels of Figure 7, and the bottom two rows of Table 3) demonstrate robustness.

Table 3. Responses of the Current Account to Temporary Government Spending and the Net Deficit

	Horizons (in years)				maximum response	year
	0	1	5	10		
Fixed Effects						
Temporary G	–0.098** (0.028)	–0.200** (0.038)	–0.042 (0.053)	–0.018 (0.058)	–0.200** (0.038)	1
Net Deficit	–0.142** (0.049)	–0.433** (0.068)	–0.341** (0.096)	–0.151 (0.105)	–0.513** (0.078)	2
Random Effects						
Temporary G	–0.075** (0.024)	–0.134** (0.034)	–0.069 (0.043)	0.043 (0.044)	–0.150** (0.042)	3
Net Deficit	–0.093* (0.044)	–0.312** (0.062)	–0.213** (0.079)	–0.112 (0.082)	–0.338** (0.070)	2

Notes: Response of the Current Account Balance (as a percent of GDP) to increases in the Temporary component of Government Spending and the Net Deficit, each by 1% of GDP. Estimated standard errors in parentheses. '**' and '*' denote statistical significance at the 1% and 5% significance levels.

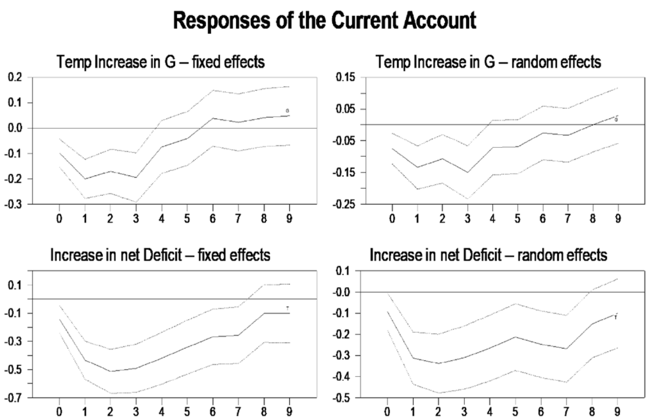

Figure 7

Notes: Response of the Current Account Balance (as a percent of GDP) to increases in the Temporary component of Government Spending and the Net Deficit, each by 1% of GDP. Model estimated over 1870-2013 with country and time fixed or random effects, as indicated. Dashed lines are two-standard-error confidence intervals.

These results suggest that the "twin deficit" hypothesis does not look like an illusion. The "fundamental current account equation's" prediction that the current account deteriorates when government expenditure increases temporarily is clearly supported by the data. However, the evidence also suggests that increases in the budget deficit that do *not* originate in temporary government spending also deteriorate the current account balance. While the effect is less than one-to-one, it is (qualitatively, at least) in line with the traditional "twin deficits" idea.

3.4 Another Nested Model

An additional way to compare the "twin deficits" and the "fundamental current account equation" approaches, would be to look separately at the effects of government spending and taxes, by allowing their temporary components to have different effects on the current account. Using the local projection technique once more, we finally estimate:

$$ca_{i,t+h} = w_i^h + v_t^h + \beta^h \Delta\hat{g}_{i,t} + \sum_{j=1}^{J} \beta_j^h \Delta\hat{g}_{i,t-j}$$

$$+\gamma^h \Delta\hat{\tau}_{i,t} + \sum_{j=1}^{J} \gamma_j^h \Delta\hat{\tau}_{i,t-j} + \sum_{j=1}^{J} \alpha_j^h ca_{i,t-j} + u_{i,t} \quad (4)$$

where notation is as before, and now the αs, βs, and γs are parameters to be estimated. The two impulse response functions of interest are now: (i) the estimated β^hs, which capture the responses to $\hat{g}$, and (ii) the estimated γ^hs, which capture the responses to temporary taxes, $\hat{\tau}$. Following our earlier discussion above, the "fundamental current account equation" predicts $\beta^h < 0$ and $\gamma^h = 0$, whereas the two deficits can be characterized as "twins" if $\gamma^h > 0$, so that the relationship holds even when the change in the budget balance comes from temporary changes in taxes.

The results from model (4) are in Table 4 and Figure 8. Perhaps not surprisingly by now, the estimates imply that *both* temporary government spending and taxes affect the current account balance, and both responses are in the direction predicted by the "twin deficit" hypothesis. Specifically, using the fixed-effects estimates first (the two left panels of Figure 8, and the two top rows of Table 4), an increase in temporary government spending (temporary taxes) by 1% of GDP reduces (improves) the current account balanceby 0.12% (0.20%) of GDP within the year, and by 0.24% (0.49%) of GDP one year later (both statistically significant). Once again, both effects gradually decay over time, eventually becoming economically and statistically insignificant. The results are robust to using random effect estimation (see the two right panels of Figure 8, and the bottom two rows of Table 4).

These findings reinforce the conclusion that the "twin deficit" hypothesis is not an illusion. While the current account deteriorates when government expenditure increases temporarily (as predicted by the "fundamental current account equation") it also improves when taxes increase temporarily (which is inconsistent with the "fundamental current account equation" but as predicted by "twin deficits").

Table 4. Responses of the Current Account to Temporary Government Spending and Temporary Taxes

	Horizons (in years)				maximum response	year
	0	1	5	10		
Fixed Effects						
Temporary G	–0.123** (0.028)	–0.242** (0.039)	–0.043 (0.053)	–0.014 (0.058)	–0.242** (0.039)	1
Temporary T	0.204** (0.057)	0.493** (0.080)	0.013 (0.112)	0.102 (0.123)	0.493** (0.080)	2
Random Effects						
Temporary G	–0.093** (0.024)	–0.161** (0.034)	–0.090* (0.043)	0.039 (0.044)	–0.174** (0.042)	3
Temporary T	0.147** (0.053)	0.370** (0.074)	0.060 (0.098)	0.000 (0.101)	0.370** (0.074)	1

Notes: Response of the Current Account Balance (as a percent of GDP) to increases in the Temporary component of Government Spending and the Net Deficit, each by 1% of GDP. Estimated standard errors in parentheses. '**' and '*' denote statistical significance at the 1% and 5% significance levels.

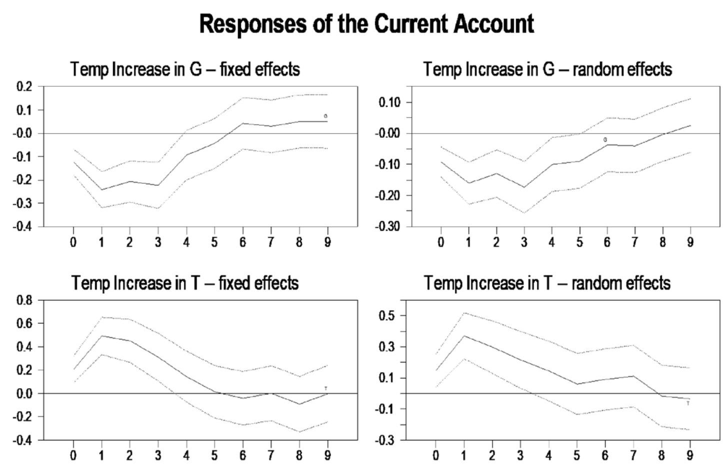

Figure 8

Notes: Response of the Current Account Balance (as a percent of GDP) to an increase in the temporary components of Government Spending or Taxes by 1% of GDP. Models estimated over 1970-2013, and with fixed or random effects, as indicated. Dashed lines are two-standard-error confidence intervals.

4. Discussion and Conclusions

This paper revisited the relationship between the balances of the government budget and the current account, a subject of extensive theoretical and empirical investigation.

One class of theoretical frameworks deliver the "Twin Deficits" hypothesis which implies that the current account deficit widens when there is an increase in the budget deficit, whether this is coming from changes in government spending or taxes.On the contrary, the "Fundamental Current Account Equation" of the intertemporal approach predicts that the current account responds only to (temporary) changes in government spending but not to taxes. Because temporary government spending is very strongly and positively correlated with the government budget deficit, showing that there is a relationship between the two deficits is consistent with both the "twin deficits" and the "fundamental current account equation", and thus incapable of assessing their relative merits. To achieve that, the present study develops a methodology that can distinguish between the two competing views.

Using annual data from 1870 to 2013 for a panel of seven OECD economies, the paper first shows that budget and current account deficits have been moving together, a finding that is consistent with the "Twin Deficits" hypothesis. Next, however, the paper shows that temporary increases in government spending deteriorate the current account balance, as predicted by the "Fundamental Equation" hypothesis.

To move beyond these results, the paper then estimates models that separate the effects of temporary government spending from those of other components of the budget deficit (including temporary taxes). The results indicate that changes in the budget deficit*other than temporary changes in government spending* also reduce the current account balance, suggesting that Twin Deficits are not an illusion.

Summing up, the evidence supports the "fundamental equation's" prediction that temporary government expansions deteriorate the current account balance—however, so do other factors that raise the budget deficit, including temporary tax cuts. This is consistent with "twin deficits".

Quantitatively, an increase in temporary government spending by 1% of GDP deteriorates the current account by a maximum of 0.20% of GDP, whereas an increase in temporary taxes by 1% of GDP improves the current account by a maximum of 0.50% of GDP.

References

Auerbach, Alan J. and Yuri Gorodnichenko. "Effects of Fiscal Shocks in a Globalized World." IMF *Economic Review*, 64, 2016, 177-215.

Barro, Robert J. "On the Determination of the Public Debt." Journal of Political Economy, 87, 1979, 940-971.

Baxter, Marianne and Robert G. King. "Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series." *Review of Economics and Statistics*,81, 1999, 575-593.

Bluedorn, John and Daniel Leigh. "Revisiting the Twin Deficits Hypothesis: the effect of fiscal consolidation on the Current Account." IMF *Economic Review*, 59, 2011, 582-602.

Christiano, Lawrence J. and Terry J. Fitzgerald. "The Band Pass Filter." *International Economic Review*,44, 2003, 435-465.

Corsetti, Giancarlo and Gernot J. Müller. "Twin Deficits: Squaring Theory, Evidence, and Common Sense." *Economic Policy*, 2006, 599-638.

Eldemerdash, Hany, Hugh Metcalf, and Sara Maioli. "Twin Deficits: New Evidence from a Developing (oil vs. non-oil) Countries' Perspective." *Empirical Economics*, 47, 2014, 825-851.

Erceg, Christopher J., Luca Guerrieri, and Christopher Gust. "Expansionary Fiscal Shocks and the US Trade Deficit." *International Finance*, 8, 2005, 363-397.

Forni, Mario and Luca Gambetti. "Government Spending Shocks in Open Economy VARs." Journal of International Economics, 99, 2016, 68-84.

Forte, Francesco, and CosimoMagazzino. "Twin Deficits in the European Countries." *International Advances in Economic Research*, 19, 2013, 289-310.

Hodrick, Robert J. and Edward C. Prescott. "Postwar U.S. Business Cycles: An Empirical Investigation." *Journal of Money, Credit, and Banking*, 29-1997, 1-16.

International Monetary Fund. *Fiscal Monitor*, April 2020.

International Monetary Fund. "Separated at Birth? The Twin Budget and Trade Balances." World Economic Outlook, chapter 4, September 2001.

Karras, Georgios. "Are 'Twin Deficits' Asymmetric? Evidence on Government Budget and Current Account Balances, 1870-2013." *International Economics*, 158, 2019, 12-24.

Kim, Soyoung, and Nouriel Roubini. "Twin Deficit or Twin Divergence? Fiscal Policy, Current Account, and Real Exchange Rate in the U.S." Journal of International Economics, 74, 2008, 362-383.

Obstfeld, Maurice and Kenneth Rogoff. Foundations of International Macroeconomics. MIT Press, 1996.

OECD. *Economic Outlook*, June 2020.

ÒscarJordà, Moritz Schularick, and Alan M. Taylor. "Macrofinancial History and the New Business Cycle Facts" in NBER Macroeconomics Annual 2016, volume 31, edited by Martin Eichenbaum and Jonathan A. Parker, University of Chicago Press, 2017.

ÒscarJordà. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review*, 95, 2005, 161-182.

Roubini, Nouriel. "Current Account and Budget Deficits in an Intertemporal Model of Consumption and Taxation Smoothing." NBER working paper No. 2772, November 1988.

World Bank. *Global Economic Prospects*, June 2020.

Appendix

Table A1

i	Correlations	
	$Corr_i(d_{i,t} , \hat{g}_{i,t})$	$Corr_i(\Delta d_{i,t} , \Delta\hat{g}_{i,t})$
CAN Canada	0.802	0.911
CHE Switzerland	0.760	0.720
GBR Great Britain	0.800	0.949
ITA Italy	0.655	0.908
POR Portugal	0.372	0.637
SWE Sweden	0.556	0.488
USA U.S.	0.777	0.933

Notes: Estimated correlations of the budget deficit ($d_{i,t}$) and the temporary component of government spending ($\hat{g}_{i,t}$) in levels and differences, by country, over the 1870-2013 period.

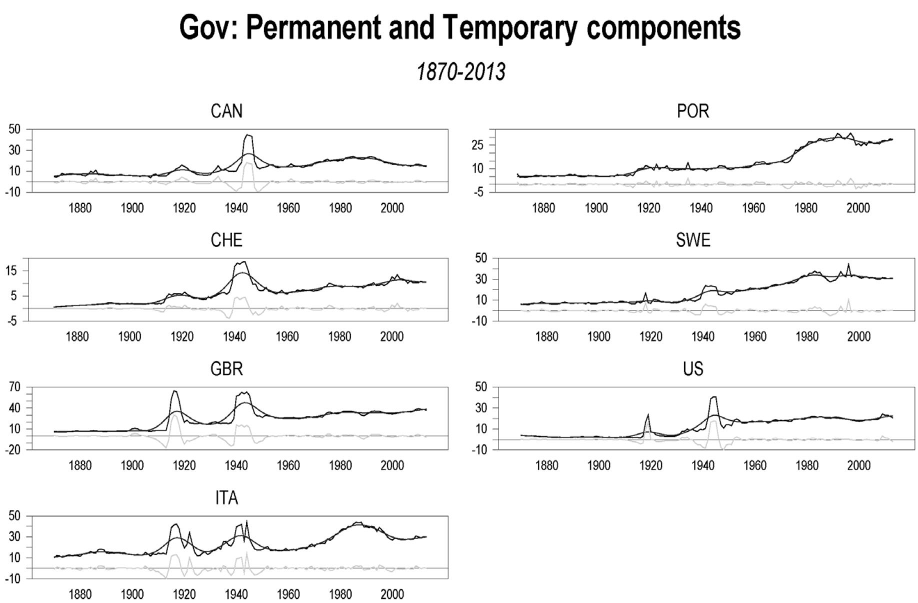

Figure A1

Notes: Decomposing Government Spending (as a percent of GDP, back lines) to Permanent (blue lines) and Temporary (green lines) Components.

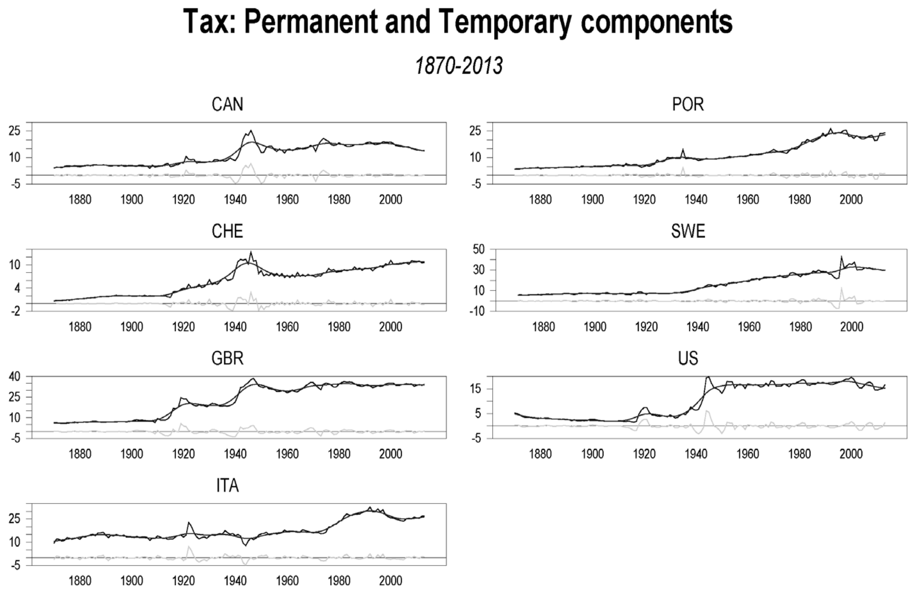

Figure A2

Notes: Decomposing Tax Revenue (as a percent of GDP, back lines) to Permanent (blue lines) and Temporary (green lines) Components.