Golden Fetters or Credit Boom Gone Bust?

A Reassessment of Capital Flows in the Interwar Period*

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Abstract

This paper uses newly digitized Balance of Payments data, covering 33 countries from 1923 to 1938, to study international capital flows and their economic implications in the interwar period. I begin by documenting the boom-bust pattern in capital flows centered on the Great Depression and, linking flows to business cycles, show that gross foreign credit is the decisive link between capital flows and adverse economic outcomes. Increases in gross foreign borrowing are associated with lower subsequent output growth, higher crisis risk and, conditional on a crisis, a more severe post-crisis recession. Crucially, gross foreign borrowing plays a more important role than net foreign borrowing and domestic credit. Turning to the channels facilitating this relationship, the Gold Standard played a crucial role by exposing countries to foreign capital via integration into the global financial system, while at the same time restricting the scope of action to respond to increased inflows. I find an equally important role for the foreign supply of capital, and propose two instrumental variable approaches to identify foreign capital supply shocks and show that they are key to understanding the documented macro-financial dynamics.

Keywords: Capital flows, business cycles, financial crises, economic history

JEL classification codes: F34, G01, G15, N10

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1. Introduction

In 1929, few believed that the world economy was on the brink of its first truly global economic crisis (Irwin, 2014), and more than 60 years later Bernanke (1994) stated that we are still a long way off from understanding 'the holy grail of macroeconomics'. We do know, however, that the unique duration and severity of the Great Depression was linked to fragile financial systems and capital markets (Bernanke and James, 1990; Bernanke, 2009; Schnabel, 2004). But where did this fragility come from? The international nature of the depression already led Fisher (1935) and Keynes (1941) to think about the role of the global financial system in creating and transmitting financial fragility. Kindleberger (1978) later added that foreign financing amplified the boom-bust pattern around crises.[1] Crucially, their approaches center on gold or net capital flows, like the current account, whereas by comparison we still know very little about gross international capital flows and their implications during the interwar era (Accominotti and Eichengreen, 2016). But this knowledge is important, as it allows us to better understand the link between capital flows, business cycles and financial crises in general and during the Great Depression in particular.

In this paper, I go beyond the traditional emphasis on gold and net capital flows and contribute to the emerging literature on gross flows as a source for financial fragility during the interwar period (Borio et al., 2014; Accominotti and Eichengreen, 2016). I find that exposure to gross foreign credit is the most important predictor of business cycle downturns, financial crises and recession severity. Net flows, in contrast, capture this exposure only imperfectly and are insignificant whenever gross flows are included in the analysis. Recently, a 'global financial cycle' (Rey, 2013) has been identified as an important driver of foreign capital supply and Bazot et al. (2022) have taken this idea into the era of the classical Gold Standard. Using a Bartik-style instrumental variable (Bartik, 1991) and principal component analysis, I show that foreign capital supply is also crucial to understanding capital flow dynamics in the interwar period. In doing so, I offer an alternative interpretation of the influential 'Golden Fetters' thesis (Eichengreen, 1996), and argue that the Gold Standard created exposure to gross capital inflows by integrating countries into the global financial system, while at the same time restricting the scope of action for governments to respond to surging capital flows.

The central source of data for this paper are the newly digitized Balance of Payments (BoP) statistics from the League of Nations (LoN) (League of Nations, 1930-1932, 1933-1939). I establish the validity of this data by showing that it accurately reflects previous findings from the literature, like the movement of physical gold and the pattern of international lending around German reparations.[2]

[1] The idea to explain domestic conditions with international finance is older still, as already Hume (1758) regarded the management of the external balance as vital for the supply of gold and domestic stability.

[2] The latter, also called 'debt carousel', refers to international lending after WWI driven by war debts and reparations. See: Spoerer and Streb (2013) for a sketch of how the 'carousel' was supposed to function, De Broeck et al. (2018) for an estimation of bilateral flows and End et al. (2019) for a detailed description of the involved financial instruments. For a

Putting gold flows into the larger context of the BoP reveals that gold made up only a tiny fraction of international flows during the Gold Standard era.[3] Similarly, the ratio of net to gross capital flows reached its trough in 1929. Both measures are consequently ill suited to characterize the global financial system on the eve of the Great Depression. In other words: when it matters most. Additionally, neither measure exhibits the strong boom-bust pattern often tied to the business cycle and financial crises (Schularick and Taylor, 2012; Jordà et al., 2013; Reinhart and Rogoff, 2009). Gross capital flows, in contrast, are not only magnitudes larger, but also show the expected cyclical pattern, with a boom until 1929, followed by a sharp and long lasting bust.

In a first exercise I use local projections (Jordà, 2005) to link capital flows to interwar business cycle dynamics, showing that gross capital inflows are followed by growth slowdowns over medium-term horizons. These results are economically meaningful with a one standard deviation increase in gross capital inflows being associated with cumulative growth being lowered by about 4 percentage points after 4 to 5 years. Yet, responses to yearly flows are only part of the story, as inflows accumulate into foreign debt positions over time. To study the relationship between cumulative foreign inflows and the business cycle, yearly flows are summed over a three year window and used in predictive regressions of GDP growth, similar to Mian et al. (2017). Again, gross inflows, accumulated into gross foreign debt, emerge as the single most significant predictor of economic downturns. The responses are larger than in the local projections, suggesting that the effect of continued foreign inflows is, to some extent, additive. Both findings hold in a battery of robustness checks where neither net inflows, nor gross outflows, show comparable dynamics.

The interwar business cycle cannot be discussed without the crisis sitting at its heart. The literature has shown that crises tend to be preceded by surges in international capital flows (Caballero, 2016; Reinhart and Rogoff, 2009) and succeeded by capital flight and sudden stops in lending (Krishnamurthy and Muir, 2017; Romer and Romer, 2017; Broner et al., 2013; Diebold and Richter, 2021). The Great Depression fits this pattern perfectly. Using a probit estimation, I confirm that gross foreign inflows are the single most reliable predictor of financial crises. In fact, adding other capital flow variables to a model already containing gross foreign inflows does not increase predictive accuracy whatsoever. Similarly, I show empirically that while the total volume of capital flows decreases, in- and outflows respond differently. Outflows slightly increase (flight), and inflows decrease sharply (stops). Given the cyclicality of capital flows around the Great Depression these results align well with economic intuition. The question is: can heterogeneous exposure to these dynamics explain the heterogeneity in economic outcomes?

discussion of gold movements in the interwar period see: James (1992) and Irwin (2012).

[3]Nevertheless, gold is often considered synonymous with interwar financial flows (James, 1992; Eichengreen, 1996), and continues to be identified as the main culprit in the transmission of the Great Depression (Fernández-Villaverde and Sanches, 2022). In fact, the volume of gold flows only increased after most countries had abandoned it as their currency base and it was allowed to flow freely between countries.

In a setting similar to Jordà et al. (2013), where the authors find that recessions become more severe when the preceding domestic credit boom was large, I study recession severity conditional on previous exposure to foreign inflows, and find that higher exposure amplifies crises. Again, the result holds in a variety of robustness checks, including different measures of exposure. This corresponds to theory developed in Caballero and Simsek (2020), where the fickleness of foreign capital turns out to be harmful due to its run-like tendencies during crises. But where does the capital run to? In the same article the authors show that the repatriation of capital can moderate recessions, as returning foreign assets can be used to buffer the effects of decreasing foreign capital availability. Inverting the previous setting to analyze capital exports (instead of imports) before crisis, I find empirical evidence for this channel. The accumulation of foreign assets helps to moderate recessions, but cannot fully offset the negative implications of foreign liabilities.

What determines the inflow of foreign capital into individual countries? Apart from the policy stance on capital mobility, this depends on the idiosyncratic domestic demand for capital and the supply of capital on international markets (Rey, 2013; Miranda-Agrippino and Rey, 2020). While borrowing abroad against future fundamentals is unlikely to have negative aggregate effects, foreign supply, unrelated to domestic conditions, is particularly crucial for adverse outcomes. The baseline specification is unable to distinguish between the two factors and potentially underestimates the effects of foreign credit. Utilizing newly collected data on bilateral portfolio investments of the United States, I isolate foreign capital supply by constructing a Bartik-style instrument (Bartik, 1991). This instrument interacts the past portfolio investment position of the United States in any individual country with the present change in the total US portfolio position. The instrumented coefficients of gross foreign inflows are highly significant and larger than the OLS-baseline, confirming a baseline bias towards zero. Following Aldasoro et al. (2020), I also adopt a more general approach to the question of foreign capital supply. Concretely, I employ principal component analysis to construct a measure of the 'Global Financial Cycle' (Rey, 2013) and use it to instrument capital inflows.[4] The instrumented coefficients remain highly significant and larger than the baseline.

Crucial to the surge in capital flows during the interwar years was the Gold Standard. As the dominant monetary system of the 1920s, it facilitated global financial integration, reduced currency risk, and signaled a commitment to the free flow of capital for member countries (Wandschneider, 2008; Bordo and Kydland, 2005). Consistent with this, I find that upon adopting the Gold Standard, countries experienced a significant increase in gross capital inflows. Simultaneously, the Gold Standard's 'fetters' constrained the scope of actions for governments to respond to increased exposure to foreign capital, as it neither allowed for capital account management, adjustments of exchange rates, nor monetary policy interventions during crises (Eichengreen, 1996). In line with this, I find

[4]The principal component is individually constructed over the capital inflows of all countries, excluding the country whose inflows are later instrumented.

that being off the Gold Standard provides some protection against the adverse effects of foreign credit, similar to employing a measure for a closed capital account. This aligns with the findings of Mitchener and Wandschneider (2015), who observe that leaving the Gold Standard led to capital controls, while the option for independent monetary policy was underutilized.

Borrowing on international markets today implies future interest payments to foreign creditors. This leads to a reduction in available domestic income, suppressing domestic activity, especially when debtors face financial constraints and creditors exhibit a lower marginal propensity to spend their additional income domestically (Eggertsson and Krugman, 2012). This condition is likely to be fulfilled when foreigners are the recipients of these interest payments. Relying again on data from the BoP, which reports 'interest and dividend payments to foreigners' as a current account item, I confirm in the first step that this variable increases with past foreign inflows. In the second step, I link contemporary interest payments to future GDP growth, finding that higher present time interest payments to foreigners are followed by reduced output growth.

Finally, to address the potential concern that the interwar period may not be a comparable testing ground for insights into the contemporary relationship between capital flows and business cycle dynamics, the main specifications are repeated using recent Balance of Payments data for OECD economies. This sample, starting in the late 1970s, contains twice as many observations as the interwar data. All results hold in the modern sample, with coefficients being remarkably similar across datasets. This suggests that my findings capture exposure to foreign capital in integrated global capital markets rather than being a peculiarity of the interwar period.

Why is increasing foreign indebtedness so robustly linked to adverse economic outcomes? On its most fundamental level is the fact that the borrower usually bears the first losses in times of crises with the lender only being affected once the borrower is forced into default (Mian and Sufi, 2015). Because it is exceptionally costly to default on international credit obligations, this can easily be applied to a situation where a country facing crisis has to cut back on domestic spending first and foreign debt payments second.[5] Peculiar to international debt is that interest payments flow abroad, which has long been acknowledged as a drain on domestic incomes (Lerner, 1948). This suppresses economic activity when debtors are financially constrained and creditors are less likely to spend their additional income domestically (Eggertsson and Krugman, 2012).

Equally important are the dynamics associated with the international supply of capital, the 'global financial cycle' (Rey, 2013). This cycle is potentially unrelated to the domestic economy and has been shown to increase financial fragility due to capital retrenchment (Milesi-Ferretti and Tille, 2011),

[5] Reinhart and Rogoff (2009) argue that this is due to international defaults cutting countries off from international capital markets for an extended period of time. In line with this, Tomz and Wright (2007) find only a weak relationship between economic downturns and defaults on foreign debt and argue that the norm is to continue debt service in the face of adverse economic shocks. This is particularly true for countries more reliant on foreign credit (Erce and Mallucci, 2018).

and run like dynamics in times of crises (Broner et al., 2013; Forbes and Warnock, 2012; Caballero and Simsek, 2020). A variation of this are 'sudden stops' where foreign funds suddenly become unavailable and financial conditions tighten (Calvo, 1998; Accominotti and Eichengreen, 2016). This paper confirms that countries which are more exposed to these dynamics also suffer more from their consequences. Gross flows are crucial in this context, as net flows can neither fully capture the exposure to foreign credit (net credit can decrease, while gross credit increases), nor is it possible that all countries experience net inflows before or net capital flight after a global crisis (Borio et al., 2014). It is, however, both possible and consistent with empirical evidence that most countries face expanding gross foreign credit before and contracting gross foreign credit after crises.

The paper contributes to three strands of literature. First, the study of international capital flows. Traditionally, from Hume (1758) thinking about external balances, over Fisher (1935) asking if capital flows transmit domestic conditions internationally, to long run studies of external imbalances like Jordà et al. (2011), the current account is at the center of attention, but findings have been dependent on sample composition and analysis.[6] This first gave rise to the question: 'does the current account still matter?' (Obstfeld, 2012; Edwards, 2002), and ultimately the insight that 'we have asked the current account to do too much' (Borio, 2016). Recent literature consequently argues for an increased focus on gross measures (Borio and Disyatat, 2015; Shin, 2012; Calderon and Kubota, 2012), to which I contribute by extending their documentation and analysis into the interwar period.

Second, the paper explores the relation between capital flows and economic outcomes. Surges in capital flows have been shown to precede downturns in the business cycle and crises (Reinhart and Rogoff, 2009; Caballero, 2016), followed by capital flight and contracting flow volumes (Broner et al., 2013; Caballero and Simsek, 2020; Forbes and Warnock, 2012). This tends to amplify the boom-bust-pattern of the business cycle (Kindleberger, 1978). While Kiley (2021) finds a link from current account deficits to crises, other studies have shown that historically, crises are equally likely in surplus and deficit countries (Obstfeld et al., 2010; Jordà et al., 2011). I show that any link between net flows and the business cycle disappears whenever gross flows are included in the model. Gross inflows instead are robustly related to adverse outcomes across all specifications.

The third contribution is to the interwar and Great Depression literature. The iconic boom-bust pattern around the Great Depression has been explained with the systematic vulnerability and pro-cyclicality of financial systems (Bernanke and James, 1990), but what makes financial systems vulnerable in the first place? The idea that it was the mismanagement of a restrictive financial system, the Gold Standard, is manifested in the metaphor of the 'golden fetters', which needed to be shed to break the downward spiral of the depression (Eichengreen, 1996; Eichengreen and Temin, 2000;

[6] See Adalet and Eichengreen (2007); Jordà et al. (2011); Hoffmann and Woitek (2010) for long run and historic samples and Mian et al. (2017); Kiley (2021); Liadze et al. (2010) for more recent sample compositions.

Ellison et al., 2023). This explanation is compelling, as it identifies a common factor among a large sample of countries experiencing severe recession. But while much of the previous focus has been on what the Gold Standard hindered countries from doing domestically, I focus on what it enabled countries to do internationally.

In Eichengreen and Mitchener (2003) the authors narrate the Great Depression as a domestic credit boom gone wrong, while Borio et al. (2014) argue that countries with large credit booms prior to the Great Depression were connected via gross capital flows. Drawing on his interwar experience, Keynes (1941) linked contractionary biases in countries heavily reliant on foreign capital to capital retrenchment, focusing on net measures. Additionally, Accominotti and Eichengreen (2016) find a sudden stop in capital flows during the depression. This is related to Quinn (2003), who shows that countries with more open capital accounts had deeper recessions. I combine these perspectives to tell the story of the Great Depression as an international credit boom that went bust. For this, the Gold Standard was instrumental by increasing exposure to global capital movements. This channel is further underlined by showing that all results hold in a modern sample without the Gold Standard, but nevertheless increasing global financial integration.

The paper proceeds as follows: Sections 2 and 3 describe the data and trends in the BoP, while Sections 4, 5, and 6 connect these trends to the business cycle, financial crises, and recession severity. Section 7 evaluates the importance of foreign capital supply in an instrumental variable setting, and section 8 the role of the Gold Standard and foreign interest payments. Section 9 concludes.

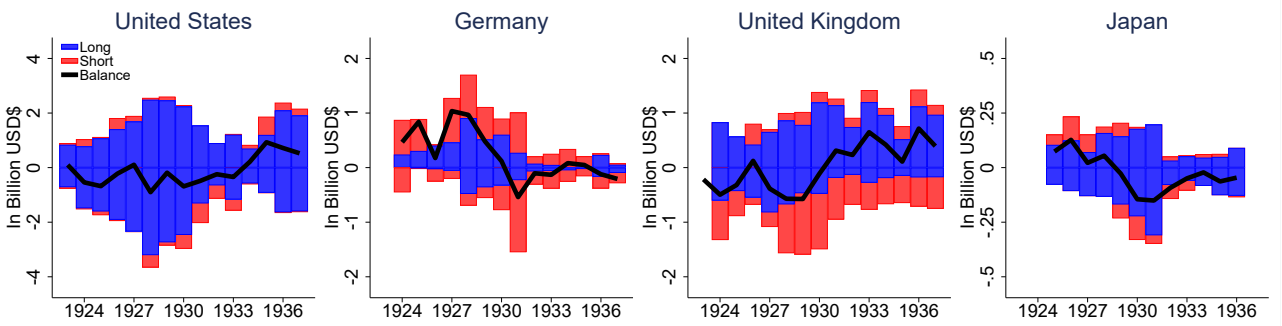
2. Data and Balance of Payments Mechanics

This section gives an overview over the digitization effort of the League of Nations data and provides an introduction to the mechanics of the Balance of Payments.

2.1. Data

My main data source are the Balance of Payments statistics, covering the years between 1922 and 1939, compiled by the League of Nations. They were first published in three volumes from 1930 to 1932 under the title 'Memorandum on International Trade and the Balance of Payments' (League of Nations, 1930-1932). These first attempts at homogenized national accounting include over 40 countries and cover the period between 1922 and 1930. The format was replaced in 1933 with the updated and revised 'Balance of Payments' (League of Nations, 1933-1939), published in seven volumes starting in 1933 and covering the years between 1929 and 1938. Across formats and volumes the coverage of countries and granularity of data differs. After digitizing all volumes and dropping countries with less than five years of coverage, I obtain an unbalanced panel of 33 countries.

Figure 1: *Capital account composition*



Notes: This figure shows the annual gross financial flows from the capital account side of the Balance of Payments for the United States, Germany, the United Kingdom and Japan. Figures are in billion US-dollars. Blue and red represent flows in long- and short-term capital flows respectively. The black line represents the capital account balance, with a positive balance indicating the net inflow of capital.

Since series frequently overlap across publications, more recent entries are used first and extended backwards with earlier data. No data is extrapolated out of range, but gaps inside existing time series are filled using linear interpolation. An example of the original publication is given in Figure A1.1 and a table with the full combined coverage of each country is shown in Table A1.1. Initially, the data is collected in domestic currency, but each publication contains the main aggregates for each country in US-dollars, using the pre-1933 Gold-Dollar parity. From this, I infer yearly exchange rates and convert all data into US-dollars. Exploiting the BoP mechanics described below, capital account balances are filled with inverted current account balances when missing, and vice versa.

To link the BoP to the business cycle, and ensure maximum coverage, it is complemented with Maddison style GDP estimates from Bolt and van Zanden (2020), GDP estimates for the Baltic states collected by Norkus and Markevičiūtė (2021) and Klimantas and Zirgulis (2020), GDP growth rates from Baron et al. (2021) and economic activity indicators (EAI) constructed by Albers (2018). Growth variables are expressed in log-changes, while BoP variables are normalized using z-score normalization. The baseline financial crisis indicator is the crisis chronology of Baron et al. (2021), which is supplemented by Reinhart and Rogoff (2009), and Grossman (1994), when countries are not covered. An overview of crises is given in Table A1.2. Gold Standard indicators are likewise from Reinhart and Rogoff (2009) and supplemented by Eichengreen (1996) and Wandschneider (2008). The capital account openness measure is based on Quinn (2003). Bilateral data for portfolio investments of the United States are collected from Dickens (1931, 1930) and Lewis and Schlotterbeck (1938). Summary statistics for the main interwar variables are shown in Table A1.3.

2.2. The Balance of Payments

The Balance of Payments is a summary of the transactions between residents and nonresidents over a year. It is separated into the current and the capital account, whose balances (the difference between credit and debit) are the inverse of each other, with their sum consequently equaling zero (IMF,

2009).[7] Figure 1 shows the capital account collected from the BoP for the US, Germany, the UK and Japan, and Figure A1.2 in the appendix reports the current account for the same set of countries. Being the inverse of each other, surpluses and deficits in the two accounts have inverse implications. A current account surplus is offset by a capital account deficit, signifying increased claims on external financial assets. Consistent surpluses are consequentially equivalent to an accumulation of foreign assets over time. A deficit, on the other hand, needs to be financed by the sale of financial assets on international markets or borrowing abroad, accumulating into net foreign liabilities. The implication is that net flows accumulate into net international investment positions, which might change due to either the revaluation of the existing position or by adding (subtracting) to it via BoP flows (Obstfeld, 2012; Bleaney and Tian, 2013; Lane and Milesi-Ferretti, 2004). This is captured in Equation 1

$$\Delta NIIP_{t+1} = NIIP_{t+1} - NIIP_t = Current_{B,t} + R_{N,t}, \tag{1}$$

where a change in the net international investment positions $\Delta NIIP_t$ equals the current account balance $Current_B$, plus the revaluation of existing net assets R_N. The NIIP can be separated into the gross international asset position (GIAP) and the gross international liability position (GILP). Similarly, net revaluations R_N are split into gross revaluations of assets (A) and liabilites (L), $R_N = R_A - R_L$, which are added to gross capital flows. This is generalized for changes over n periods in Equation 2 for the GILP:

$$\Delta_n GILP_{t+n} = GILP_{t+n} - GILP_t = \Sigma_t^n Capital_{C,t} + \Sigma_t^n R_{L,t}. \tag{2}$$

Here $Capital_C$ refers to capital account credit and $R_{L,t}$ to the revaluation of existing gross liabilities.[8] Because accumulated flows, less revaluations, reflect changes in international investment positions, the magnitude of revaluations determines how precisely flows approximate changes in these positions. When revaluations are cyclical, financial flows provide close approximations. When valuations steadily move in one direction, accumulated flows grow gradually less precise (Atkeson et al., 2022). Equation 3 formalizes the approximation of changes in investment positions using BoP flows over n periods for the GILP.

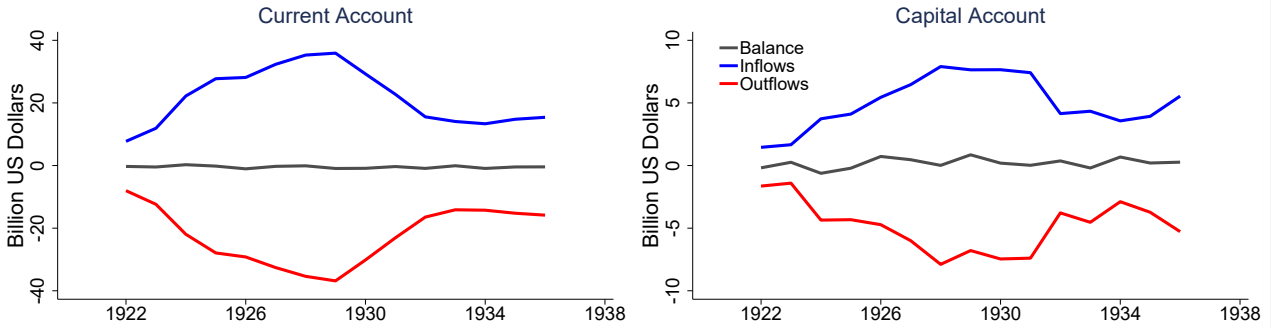
$$\Sigma_{t=0}^n Capital_{C,t} = \Delta_n GILP_{t+n} - \Sigma_t^n R_{L,t}. \tag{3}$$

As revaluations are not included in the LoN statistics and are difficult to calculate, the left hand side of Equation 3 is used as the main independent variable throughout this paper. It is to

[7] Small deviations, due to changes in accounting, defaults, lagged payments or exchange rates are possible.

[8] Changes in the $GIAP$ are defined analogously as: $\Delta_n GIAP_{t+n} = GIAP_{t+n} - GIAP_t = \Sigma_t^n Capital_{D,t} + \Sigma_t^n R_{A,t}$, where $Capital_D$ refers to capital debit and R_A to the revaluation of existing gross assets.

Figure 2: *The balance of payments, sample properties*



Notes: This figure shows gross financial flows, summed over all sample countries, between 1922 and 1936. The left panel shows the current- and the right panel the capital account. Inflows (credit) and outflows (debit) are shown in blue and red respectively. Their difference is shown in grey.

be understood as the change in international investment positions, excluding revaluations. It is important to emphasize that while the current account balance accumulates into the NIIP, gross current account flows do not accumulate into a stock of assets or liabilities and are not a theoretically meaningful concept. First, because the items concerned are goods and services and not connected to the acquisition of financial assets. Second, these items do not pile up into goods and service positions, but the capital streams financing them potentially do. Third, already consumed goods are not subject to revaluations. Additionally, variation in the current account must be driven by residents of other countries deciding to purchase fewer, or more, goods from a particular country, a decision unrelated to the gross financial flows attached to these transactions. This means that, ultimately, the current account is driven by capital flows and not vice versa (Borio, 2016).

Sample Properties: The total amounts of worldwide credit and debit flows are always equal, because the world is a closed financial system. Any sample not covering the entire world or not representing a perfectly closed system might deviate from this parity. If a sample becomes large enough to approach either condition, the difference between credit and debit will consequently converge to zero. This also implies that the average net exposure to foreign capital will likewise converge to zero. Figure 2 shows that this is the case for the group of countries covered by the League of Nation's BoP statistics. The left panel plots the credit and debit entries summed up over all sample countries for the current account. The right panel does the same for the capital account. In both cases the series for credit and debit almost perfectly mirror each other, as indicated by their difference fluctuating around zero. This shows that the sample forms an almost closed system of trade and capital flows, in which gross flows are highly synchronized with the business cycle, while net flows on aggregate cannot capture this pro-cyclicality. Gross current account flows peak in 1929 and roughly half during the Great Depression. Capital flows already peak in 1928, but do not shrink significantly until 1931. This relates back to this being a period of capital retrenchment, where new lending stops, but foreign capital is being repatriated, resulting in large gross flow volumes in and out of countries.

3. A short History of Capital Flows in the Interwar Period

This section takes a closer look at the development of financial flows in the interwar period. It shows first how key findings from the literature map into the balance of payments, followed by a discussion of the key trends in interwar capital flows.

3.1. From gold flows to net flows to gross flows

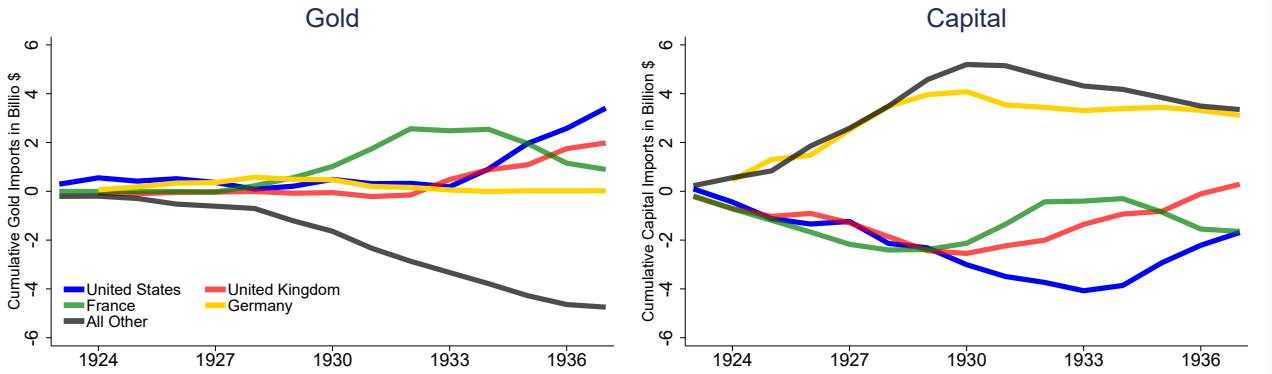
Two prominent topics of the interwar literature are the Gold Standard (and its abandonment) and the 'debt carousel' revolving around Germany, the United States, the United Kingdom and France. The focus on external imbalances, inherent to both, continued to shape the approach to international capital flows, with gross and net capital flows often being treated as synonymous until long after the Gold Standard had been abandoned and the debt carousel had stopped spinning.

The interwar Gold Standard was flawed from the get go, this much seems to be a common understanding. Most countries returned to gold on parities that no longer reflected their economic conditions, disrupted by World War I, hyperinflation and the unraveling of global trade (Irwin, 2012; Eichengreen and Temin, 2000; Eichengreen, 2008).[9] The internal logic of the Gold Standard dictates that countries with undervalued currencies and inflationary policies attract gold, as it can be used to acquire domestic currency cheaply. Consequentially, countries with deflationary policies and gold parities above the market price for gold will fail to attract gold (Bordo and Kydland, 2005; Wandschneider, 2008). The countries taking center stage in this story are France, returning to gold at a vastly discounted rate, set in 1926 and formalized in 1928, and the United Kingdom returning to gold at the overstated pre-war parity in 1925. The United Kingdom's subsequent failure to attract gold resulted in it being the first major economy to abandon gold and devalue its currency as early as 1931. France, instead, started to accumulate gold from 1927 onward and remained on the Gold Standard until 1936. The other major economies experienced gold inflows of smaller magnitude during the 1920s (Bernanke, 2009; Irwin, 2012).

These developments are shown in the left panel of Figure 3 using BoP data. It plots cumulative net gold inflows since 1923, with France standing out as the largest importer of gold. This gold, however, did not come by way of draining the other major economies of gold, but only hindered them to accumulate as much gold themselves as they desired. The net gold inflow to France and,

[9]Countries differed hugely in how and when it was implemented. Before WWI the Gold Standard was largely homogeneous (Bordo and Kydland, 2005), but when countries returned to it (US in 1922, Germany in 1924, UK in 1927, France implicitly in 1926 and explicitly in 1928 (Reinhart and Rogoff, 2009)), that changed. Some returned at overstated parities (US and UK), others at discounted rates (France) (Irwin, 2012). Some had large gold reserves (US), others almost none (Germany) (Eichengreen and Mitchener, 2003). Most reinstated circulation of physical gold, but others (Germany) never did (Deutsche Bundesbank, 1976). Some had accumulated gold in the 1920s (France), while others only had small positive (US and Germany) or negative (UK) net inflows. The exit from gold was equally heterogeneous. Most countries left gold during the Great Depression, but the gold block, led by France, accumulated enough gold to believe it could stay on gold throughout the crisis, holding on until the mid 1930s (Bordo and Edelstein, 1999; Eichengreen and Irwin, 2010).

Figure 3: *Cumulative net gold- and net capital flows*



Notes: This figure plots in the left panel the cumulative net gold inflows for the four major economies of the time, the US, UK, Germany and France, as well as a fifth category including all other countries. In line with the interwar literature, France absorbs more gold than any other country in the late 1920's and early 1930's. It also shows that the moment the UK and the US abandon gold and devalue their currencies in 1931 and 1933, they start to attract gold inflows. The right panel plots the cumulative capital account balance for the same group of countries. It shows that the US, the UK and France supplied money to debtor countries and particularly Germany in the 1920's, but also that these net positions had largely reversed by the mid 1930's.

in smaller magnitude, to Germany and the United States instead came from peripheral countries (Eichengreen, 2008), as indicated by the gray line. In 1931, the United Kingdom, having failed to attract gold in the 1920s, left gold and devalued its currency with immediate effect. Gold started to flow into the country. In 1933, the US followed suit, devaluing the dollar and subsequently entering a period of consistent gold inflows. This effectively appreciated the Franc, even though the Banque du France fought to maintain the previous parity (Wandschneider, 2008; Irwin, 2012), with the result that gold started to flow out of France starting in 1934 and before it left gold in 1936.

The return to gold was meant to be a signal for the return of the pre-war stability. Yet it also turned out to be a facilitator of the external imbalances of the interwar years (Wandschneider, 2008; Bordo and Kydland, 2005). These imbalances are manifested in the metaphor of a debt carousel in which a group of creditor countries, centered on the United States, supplied a group of debtor countries, centered on Germany, with credit (End et al., 2019; Spoerer and Streb, 2013). International lending picked up steam during the Roaring Twenties when a common peg to gold ensured predictable exchange rates and the free flow of capital. The result was an accumulation of imbalances and an increasingly intertwined global 'web' (De Broeck et al., 2018) of financial relations. The onset of the Great Depression and the gradual abandonment of gold broke this cycle and led to capital retrenchment and financial disintegration (Kindleberger, 1978; Bernanke, 2009).

The right panel of Figure 3 visualizes these developments by plotting the cumulative capital account balance. It confirms the impression from Figure 2 that the sample approaches a closed system where total net inflows equal net outflows. Three net creditors - the United States, the United Kingdom and France - supply money to the global financial system in general and Germany in particular. Interestingly, the Great Depression does not lead to a stagnation of net positions (as

would be the expected result of a total breakdown in financial flows), but a reversal of imbalances as creditors begin to repatriate their foreign assets.[10] An exception is Germany which, after settlements with its creditors and the rise of the National Socialists to power, stagnates on a high level of net foreign credit (Ritschl, 2014). Surprisingly, and against conventional wisdom, no sudden stop or withdrawal of *net* foreign lending is discernible for the United States.[11] In fact, the United States continued to be a net capital exporter until 1933, reflecting the structure of its foreign assets, which were mostly long-term and difficult to repatriate on short notice (Ritschl, 2009).

Establishing a direct connection between gold and net capital flows is difficult, but gold might still help to explain the persistent focus on net capital flows. The gold standard's mandate for stability and the fact that it was the *net* availability of gold which was relevant, resulted in a desire for 'balanced' capital flows. This was formulated as early as Hume (1758) and is well documented in Eichengreen and Temin (2000). Similarly, Keynes (1941) linked countries' net foreign deficits to contractionary biases in the Great Depression.[12] But why should we care? The idea of economies in surpluses, deficits and imbalances continues to frame the debate on capital flows, even though net flows are dwarfed by their gross counterparts. Net flows also tell us little about gross flows, as it is easily possible for net flows to decrease while gross flows increase (Borio, 2016; Borio and Disyatat, 2015). Focusing on net flows consequently lets the volume of financial relationships go largely undetected. Only recently has this come under scrutiny with Bernanke (2005) questioning the adequacy of the current account in describing the large global capital flows prior to the 2008 crisis and Borio (2016) stating that '*current accounts have been asked to do too much and focusing on them excessively can lead policy astray*'. Shin (2012) and Obstfeld (2012) similarly state the limits of net values and argue for an increased awareness of gross measures.

3.2. Trends in Balance of Payments flows

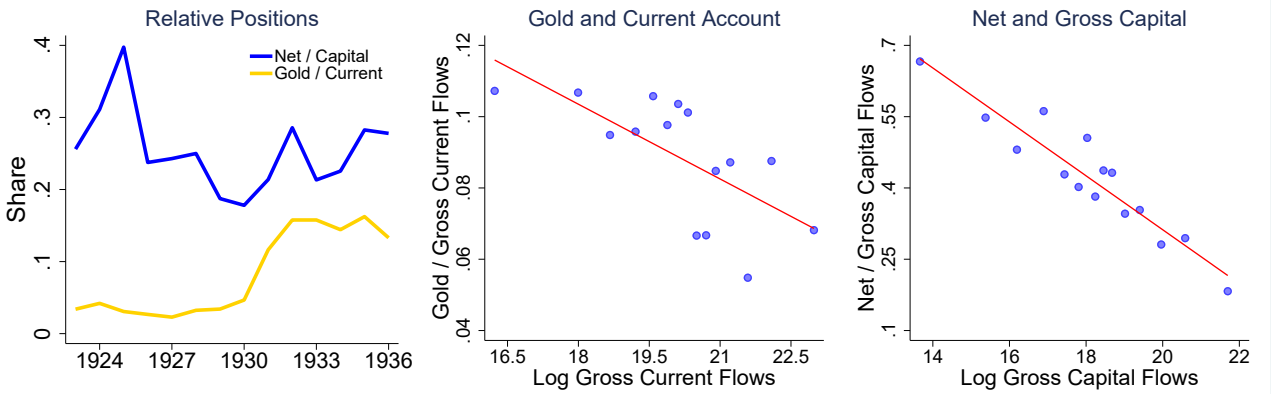
A study of the Gold Standard or external imbalances, by definition, is concerned with net flows. Net gold flows determine the level of currency coverage and net capital flows determine the buildup of imbalances. Figure 3 can track both, but yields no information on the magnitude of either. To get a sense of these magnitudes, the left panel of Figure 4 plots ratios of net to gross capital- and gold to gross current account flows over time. Net flows fluctuate around 25 percent of gross flows and reach

[10] Figure A2.3 in the appendix quantifies these findings for a larger group of countries, showing that net capital exporters before 1930 become net capital importers afterwards and vice versa.

[11] For gross flows, the story is quite different, with a sudden stop occurring in 1928 (Accominotti and Eichengreen, 2016). Later chapters will address this development in greater detail.

[12] Determined to evade these imbalances in the future, he worked to enshrine rigid capital controls in the Bretton Woods agreement in 1944, where again the overarching mandate was stability. Keynes advocated for the reduction of imbalances by increasing the supply of international money. This effectively meant increasing the smaller of the gross positions to decrease imbalances. The plan was abandoned in favor of a tuned down version with capital controls and 'special drawing rights' for net debtor countries (Crowther, 1949).

Figure 4: *Gold flows, net flows and gross flows compared*



Notes: This figure relates gold and net to gross financial flows. The left panel plots the ratios of net- to gross capital (blue) and gold to gross current account flows (gold) over time. The middle and right panel quantify the relationship using binned scatterplots with 15 equal sized bins. The middle panel plots the ratio of gold to gross current account flows against log gross current account flows, the right one the ratio of net- to gross capital flows against log gross capital flows. The implication is clear: when gross flows grow large during business cycle peaks, net and gold flows become less representative of international capital flows.

their slump in 1929, at below 20 percent. While gross flows peak on the eve of the Great Depression, this is the moment when net flows are least adequate to describe global capital movements. The ratio of gold to gross current account flows stays flat below 5 percent through the 1920s until it triples between 1930 and 1931. This has two reasons. First, gross current account flows decrease sharply as global trade collapses. Second, the United Kingdom leaves the Gold Standard in 1931, devalues its currency and starts to attract large gold inflows, in the process increasing the volume of traded gold. Similar to net flows, gold flows can hardly characterize the interwar capital cycle, as they neither show the characteristic cyclical variation, nor make up a large share of total capital movements.

The middle and right panel quantify these findings using binned scatterplots. The middle panel plots the ratio of gold to gross current account flows against log gross current account flows, the right panel the ratio of net to gross capital flows against log gross capital flows. Both relationships are distinctly negative, suggesting that the larger gross flows get, the less they can be represented by gold- or net flows, which do not grow by the same proportion. Consequently, the exposure to global uncertainty, capital retrenchment and financial fragility that has been attributed to international capital flows, cannot fully be captured by either of them. These observations echo the mixed success net measures have had elsewhere when trying to tie capital flows to domestic economic and financial conditions (Kiley, 2021; Jordà et al., 2011; Mian et al., 2017; Gourinchas and Obstfeld, 2012).

Figure A2.4 in the appendix plots the sub-components of the current and capital account individually. The boom-bust-pattern, already observed in Figure 2, is now not separated into credit and debit, but into separate account items. The main variation in the current account comes from flows connected to trade in merchandise. With a big gap, the second and third largest items are services and flows related to secondary incomes such as interest and dividends. Gold follows last, making up

the smallest fraction of the current account. Within the capital account long-term flows are the largest item, but short-term flows still contributed around 30% before the Great Depression. Afterwards, the composition changes sharply as long-term flows plummet while short-term flows increase, stabilizing total capital flows on a high level for an additional year into the crisis. The boom-bust pattern, centering on the Great Depression, is similar to the current account. The rightmost panel confirms the visual impression of a high co-linearity between the two accounts by plotting them against each other and producing a 45° line.

4. Capital Flows and Business Cycle Dynamics

How do capital flows map into the business cycle and is it possible, despite the high colinearity between credit and debit, to distinguish the effects of individual BoP components? This section starts with local projections (Jordà, 2005) of GDP growth using BoP variables and then continues by computing cumulative BoP positions, building on the intuitions developed in section 2, to study the medium term relationship between BoP flows and the business cycle.

4.1. Output dynamics after Balance of Payments flows

To model the dynamic response of output following BoP flows I estimate local projections (Jordà, 2005) based on the following equation:

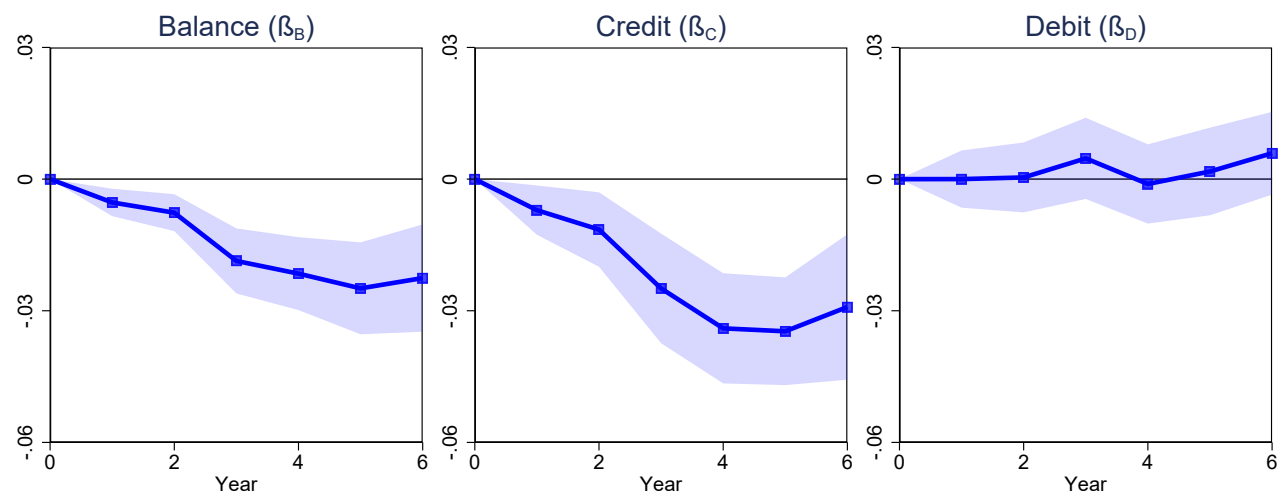
$$\Delta_h y_{i,t+h} = \alpha_{i,h} + \sum_{j=0}^{2} \beta_{C,j}^{h} Credit_{i,t-j} + \sum_{j=0}^{2} \beta_{D,j}^{h} Debit_{i,t-j} + \gamma^{X} X_{i,t} + u_{i,t+h}\,, \tag{4}$$

where $\Delta_h y_{i,t+h}$ is log GDP growth[13] for horizons $h = 1, ..., 6$ and *Credit* and *Debit* refer to the corresponding items in the capital account. Since the *Balance* is a linear combination of gross flows the response to it cannot be estimated in the same regression and is computed individually. All BoP variables are normalized to unit standard deviation on country level. Ultimately of interest are the β_0^h coefficients for balance, credit and debit over horizons h. All specifications control for two lags of the independent variables and country fixed effects. The control vector $X_{i,t}$ additionally includes two lags of GDP growth in the baseline and additional controls in later robustness exercises.

The left panel of Figure 5 plots the response to the capital account balance. A one standard deviation increase in the capital account balance (net inflows) is followed by a cumulative growth slowdown of about 2.5 percentage points in $t + 5$. The response is statistically significant at the 95% level across all horizons. Given that the capital account balance is simply the inverse of the current account balance, these estimates directly map into findings where a deterioration in the

[13] Log differences from all sources for GDP are combined to ensure maximum coverage. For transparency, the results for sub-samples and the combined coverage are presented separately in Table A3.5

Figure 5: *Capital flows and business cycle dynamics*



Notes: This figure shows local projection results from Equation 4. The left panel plots the cumulative response of log GDP growth to the capital account balance. The middle and right panel do the same for credit and debit respectively. The response to the capital account balance (net flows) in the left panel can be seen to be driven by the response to gross credit flows in the middle panel. This response is significantly negative over all horizons and reaches its trough in $t+5$, when GDP growth is cumulatively reduced by 4 percentage points in response to a one standard deviation increase in credit in year t. The GDP response to gross debit flows is insignificant across all horizons, and, if anything trends in the opposite direction of the credit response. Standard errors are dually clustered on country and year. Shaded areas represent 95% confidence intervals.

current account balance is linked to adverse outcomes (Kiley, 2021; Jordà et al., 2011; Gourinchas and Obstfeld, 2012). The middle and right panel decompose the capital account balance into its separate components by plotting the jointly estimated GDP responses to credit and debit flows in year t respectively. The estimates show that the result in the left panel is driven entirely by credit in the middle panel, while the response to debit is insignificant over all horizons. In response to a one standard deviation increase of gross capital inflows in year t, cumulative GDP growth is reduced by 4 percentage points in $t+5$.

Conceptually, this closely corresponds to BoP mechanics and the argument in Borio (2016) and Borio and Disyatat (2015), where excess spending on goods and services, as captured in the current account balance, needs to be financed with capital inflows from abroad. Over time these inflows accumulate into foreign debt, but it is not the excess spending captured by net flows, but the payment streams attached to them that ultimately matter for economic outcomes.

4.2. BoP flows and business cycle dynamics in the medium term

Yearly flows have a measurable relation with future output dynamics, despite not taking into account the accumulation of international investment positions over time. Yet, for capital inflows this is particularly important as they accumulate into foreign debt positions, which have been linked to economic downturns empirically (Reinhart and Rogoff, 2009; Caballero, 2016; Forbes and Warnock, 2012; Diebold and Richter, 2021), as well as theoretically (Schmitt-Grohé and Uribe, 2016; Mian et al.,

Table 1: *Capital flows and business cycle dynamics, 3-year cumulative capital flows*

	$\Delta_2 Y_{i,t+2}$			$\Delta_3 Y_{i,t+3}$			$\Delta_4 Y_{i,t+4}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	-0.02***	0.01		-0.03***	0.01		-0.03***	0.01	
	(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)	
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		-0.04***	-0.04***		-0.06***	-0.05***		-0.05***	-0.05***
		(0.01)	(0.01)		(0.02)	(0.01)		(0.02)	(0.01)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			0.00			0.00			-0.00
			(0.01)			(0.01)			(0.01)
R^2	0.123	0.232	0.229	0.216	0.339	0.338	0.417	0.497	0.497
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
p-value, $\beta_{Credit} = \beta_{Balance}$		0.01			0.01			0.01	
p-value, $\beta_{Credit} = \beta_{Debit}$			0.00			0.00			0.00
Observations	363	363	363	336	336	336	305	305	305

Notes: This table presents estimation results from Equation 5. The dependent variable is log GDP growth over horizons t to $t+h$. The independent variables are cumulative capital account flows summed from $t-2$ to t. All specifications control for country fixed effects. Adjusting for longer time spans, lagged growth indicates two, three and four year distributed lags of GDP growth, depending on the length of the forecast horizon. The reported p-value refers to a test for the equality of coefficients. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

2020). Building on the intuition of section 2, I now compute cumulative BoP positions and use them in predictive regression of GDP growth similar to Mian et al. (2017) in Equation 5

$$\Delta_h y_{i,t+h} = \alpha_i + \beta_B^h \sum_{j=0}^{2} Balance_{i,t-j} + \beta_C^h \sum_{j=0}^{2} Credit_{i,t-j} + \beta_D^h \sum_{j=0}^{2} Debit_{i,t-j} + \gamma^X X_{i,t} + u_{i,t+h}, \qquad (5)$$

where $\Delta_h y_{i,t+h}$ is log GDP growth from year t to $t+h$ and BoP flows are summed over the three years from t to $t-2$. All specifications again control for country fixed effects and the vector $X_{i,t}$ additionally includes two lags of GDP growth in the baseline and additional controls in robustness checks. Due to every part of the BoP being a linear combination of the other two, only two coefficients can be estimated jointly.

Columns (1), (4) and (7) in Table 1 report the coefficient for the cumulative capital account balance. It is significantly negative across all three specifications, confirming the dynamic response from the local projection exercise. Adding gross inflows in columns (2), (5) and (8) shifts predictive power away from net inflows entirely. Both the coefficient and R^2 increase twofold when gross capital inflows are included in the model, while the coefficient for net inflows becomes close to zero and insignificant. The p-value reported in the table consequently soundly rejects the equality of the two coefficients. Including both types of gross flows in columns (3), (6) and (9) does not change the estimate for gross capital inflows, which remains large and negatively significant. The coefficient for cumulative capital outflows is zero. Again, the equality of coefficients can be rejected.

Along the time dimension the results in Table 1 are similar to the local projections in Figure 5.

Coefficients increase between the two and three year forecast horizon, but begin to phase out in $t+4$. This suggests that the majority of the response to capital inflows is concentrated in the first few years with decreasing effects over time. As the sample is largest for the forecast horizon in columns (1) to (3) and the majority of the effects is concentrated in this period, this horizon is chosen as the baseline for the remaining paper. All results, however, also hold with alternative forecast lengths. Coefficients for cumulative credit are notably larger (4 to 6 percentage points) than the yearly flow coefficients estimated in the local projection (3 to 4 percentage points). This suggests that the effect of repeated gross foreign borrowing is at least partially additive. When foreign credit accumulates, growth slowdowns become more severe.

4.3. Robustness

How robust are these results and how do they compare to other variables that have been used to explain the interwar business cycle? Starting with the latter question, columns (1) and (2) of Table 2 display the individually estimated coefficients for capital flows from Table 1 for the fixed sample for which additional variables are available. Column (3) shows that, in line with Eichengreen and Mitchener (2003), domestic credit growth has a significantly negative relationship with future GDP growth. Column (4) and (5) confirm the same for the Gold Standard and financial crises. Column (6) adds the ratio of central bank gold holdings to money in circulation, which does not produce a significant coefficient. Arguably, the Gold Standard in conjunction with financial crises exacerbates downward pressure on the economy (Eichengreen, 1996), so column (7) interacts the two variables. While both remain individually significant, their interaction coefficient goes in the expected direction, but without being significant. To test if the Gold Standard's deflationary effects are contingent on a country's gold coverage, column (8) interacts the Gold Standard with the central bank gold ratio. Again the interaction coefficient is insignificant. Finally, column (9) display all coefficients jointly, with the result, that gross foreign credit emerges as the single most robust predictor of economic downturns in the medium term.

Looking at the dynamic response of GDP upon the inclusion of other variables in greater detail Figure 6 repeats the local projection exercise including additional control variables. For comparison, the baseline estimation from Equation 4 is plotted in blue. The specifications reported in orange and gold include the growth in domestic credit and a gold standard indicator for years t to $t-2$, respectively. This results in slightly dampened coefficients, but overall similar dynamics. The purple line includes the net in- and outflow of gold for the same three years, with very little effect on the baseline coefficients. The same is true for the inclusion of a financial crisis indicator, plotted in green. Together, the results confirm that the link between gross foreign inflows and future growth dynamics is a consistent property of the data.

Table 2: *Capital flows and business cycle dynamics, comparison to other explanatory variables*

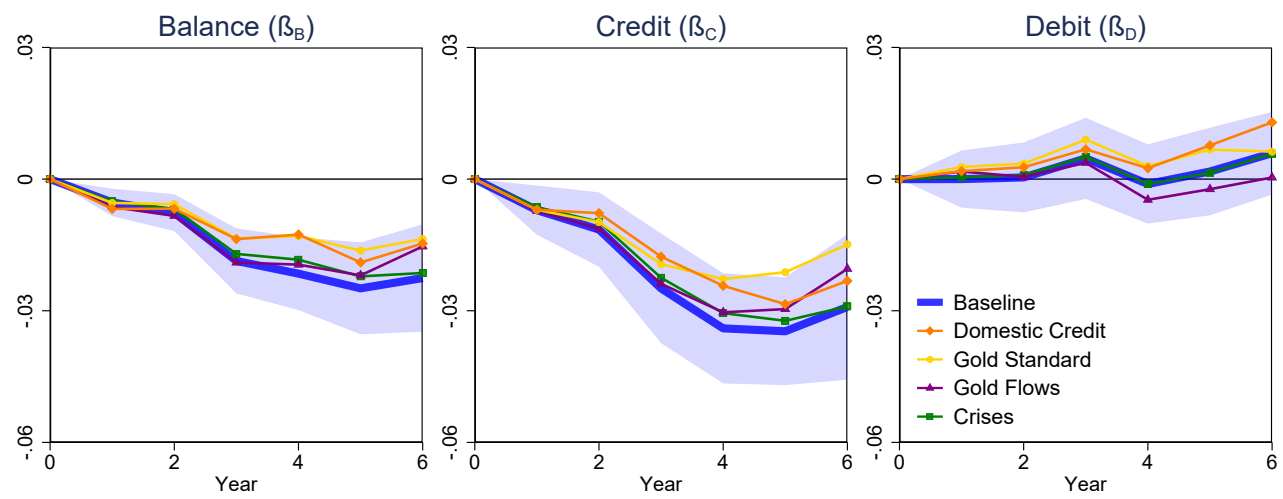
	$\Delta_2 Y_{i,t+2}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.04***								-0.04***
	(0.01)								(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$		-0.03***							0.01
		(0.01)							(0.01)
$\Sigma_{j=0}^{2} Domestic\ Loans_{i,t-j}$			-0.02**						-0.01
			(0.01)						(0.01)
$Gold\ Standard_{i,t}$				-0.07***			-0.07***	-0.04*	0.00
				(0.02)			(0.02)	(0.03)	(0.02)
$Crisis_{i,t}$					-0.06**		-0.02	-0.02*	-0.00
					(0.03)		(0.01)	(0.01)	(0.02)
$Gold\ Coverage_{i,t}$						-0.00	-0.00	-0.00	0.00
						(0.00)	(0.00)	(0.00)	(0.00)
$Gold\ Standard_{i,t} \times Crisis_{i,t}$							-0.03	-0.03	-0.04
							(0.03)	(0.03)	(0.03)
$Gold\ Standard_{i,t} \times Gold\ Coverage_{i,t}$								-0.00	-0.00*
								(0.00)	(0.00)
R^2	0.286	0.153	0.123	0.211	0.118	0.078	0.232	0.238	0.355
Country fixed effects	✓	✓	✓	✓	✓		✓	✓	✓
LDV	✓	✓	✓	✓	✓		✓	✓	✓
Observations	295	295	295	295	295	295	295	295	295

Notes: This table presents estimation results from Equation 5. The dependent variable is log GDP growth over horizons t to $t+h$. The independent variables are cumulative capital account flows summed from $t-2$ to t and additional variables that have been used to explain business cycle dynamics in the interwar period. See text. All specifications control for country fixed effects and two lags of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A3.4 in the appendix addresses the question of robustness over different periods of capital flows. BoP variables are summed over five, instead of three years with results remaining similar to the baseline. As this reduces sample size, but does not add much predictive power to the model, the baseline specification of three-year sums is employed throughout the paper. Because GDP data is compiled from a variety of sources, to ensure maximum coverage, I show in Table A3.5 that it is not a sub-sample of GDP data driving the results. Coefficients for the two largest contributors to GDP data and the total sample are estimated separately, with coefficients being almost identical. Similarly, it might be possible that the aggregate results are driven by large outliers. Figure A3.5 reports country level coefficients for gross inflows, showing that the negative relationship with GDP growth holds for the vast majority of countries. Table A3.6 provides evidence that the impact of BoP flows is not constrained to GDP by estimating their relationship with financial and non-financial equity returns. Again, only gross foreign credit exhibits a significantly negative coefficient.

Finally, Table A3.7 checks the baseline specification itself for robustness against potentially biasing factors. I first address the concern that the long downturn of the Great Depression might be the sole driver of the observed relationship and split the sample in 1929. The relationship holds in both

Figure 6: *Capital flows and business cycle dynamics, robustness specifications*



Notes: This figure shows local projection results from Equation 4 including additional control variables. The left panel plots the cumulative response of log GDP growth to the capital account balance. The middle and right panel do the same for credit and debit respectively. For the coefficients reported in orange the growth in domestic credit in years t to $t-2$ is added to the baseline specification. The coefficients in gold and purple include a gold standard indicator and gold flows for the same years respectively. The green line corresponds to estimates including a dummy for financial crises in the same years. Standard errors are dually clustered on country and year. Shaded areas represent 95% confidence intervals.

sub-samples. Is only a small group of core countries producing the results? To answer this question I report coefficients for the core countries of North America and Europe[14] and all other countries separately. Again, the results hold in both groups. Continuing the discussion about the relevance of net positions, I split the sample along the current account being positive or negative in year t, which produces virtually identical coefficients. Lastly, the link between gross capital inflows and output might be non-linear, with one tail of the distribution accounting for all variation in outcomes. I interact credit with a dummy for credit between t and $t-2$ being above or below zero[15] and show that the relationship is, in fact, close to linear.

5. Capital Flows and Financial Fragility

Large international capital flows, and especially inflows tend to precede financial crises (Caballero, 2016; Reinhart and Rogoff, 2009). Inflows are potentially unrelated to domestic conditions, cause maturity and currency mismatches and increase exposure to global uncertainty (Rey, 2013; Obstfeld, 2012). After crises, these flows tend to revert (sudden stops or capital flight) (Broner et al., 2013; Caballero and Simsek, 2020; Forbes and Warnock, 2012), when the cost of financial intermediation increases (Romer and Romer, 2017; Jordà et al., 2013). Earlier work has linked current account balances and particularly deficits to crises (Kiley, 2021; Caballero, 2016), while historically, crises seem just as likely in surplus, as in deficit countries (Obstfeld et al., 2010; Jordà et al., 2011). This chapter

[14]The United States, United Kingdom, France, Germany, Canada and the Netherlands
[15]Since all variables are normalized, this is equivalent to credit growth being above or below mean growth.

takes a closer look at capital flows around crises in the interwar period. Given the predominance of the Great Depression, this approaches a case study of the Great Depression exploiting its varying starting points across countries.

5.1. Capital flows and financial Crises

I begin by establishing a descriptive link between capital flows and the frequency of financial crises. The crisis classification is based primarily on Baron et al. (2021), with missing countries being covered by Reinhart and Rogoff (2009) and Grossman (1994).[16] Figure A4.6 shows crisis probabilities in different quartiles of cumulative capital flows from $t-2$ to t. Crisis frequency in the highest quartile of gross foreign inflows is about 15% (the highest of any quartile), but only 2% in the lowest one. This pattern of increasing crisis frequencies from low to high quartiles is much less pronounced for net inflows and gross outflows. To more formally exploit the connection between capital flows and crisis occurrences I turn to a probit estimation, as it is widely used in the literature. Coefficients are estimated based on Equation 6, where a financial crisis in country i in year t is denoted by the indicator variable $F_{i,t}$, conditional on capital flows from the Balance of Payments $X_{i,t-n}$

$$Pr[F_{i,t} = 1|X_{i,t-1}] = \Phi(\beta X_{i,t-n}). \tag{6}$$

Gross capital flows, as shown, are highly pro-cyclical and the Great Depression dominates the interwar crisis chronology. Because of this, the crisis dating exercise relies on country specific gross capital im- and exports as well as heterogeneity in the starting dates of crises across countries. The results are reported as mean marginal effects in Table 3. The predictive accuracy is reported in the AUC-statistic (Area Under Curve), which is an integral of the space under the ROC-Curve (Receiver Operating Characteristic) and the standard benchmark for classification accuracy. The AUC takes the value 0.5, if the choice of the indicator variable based on the model is random. It approaches 1, if the model becomes perfectly able to distinguish between crisis and non-crisis observations.

In line with the idea that crises are equally likely in surplus and deficit countries (Obstfeld et al., 2010; Jordà et al., 2011), net capital flows in column (1) are not significantly related to future crises occurrences. Together with the two included lags of GDP growth, however, the model does have some ability to sort the data into crisis and non-crisis bins, as indicated by the AUC of 0.72. Column (2) adds gross capital inflows to the model, which unlike net inflows, are significantly related to crisis occurrence, with a one standard deviation increase in gross inflows implying an increase in crisis probability of 0.6 percentage points. Given a sample frequency of about 6%, this corresponds to crises being 10% more likely. Importantly, the AUC increases to 0.75, indicating improved precision

[16] The final set of crises in the interwar period is described in Table A1.2.

Table 3: *Capital flows predicting financial crises*

	$BVX\,Crisis_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	0.01	-0.03			0.03	-0.02		
	(0.02)	(0.02)			(0.02)	(0.03)		
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		0.06***	0.03**	0.04***		0.08***	0.06***	0.06***
		(0.02)	(0.01)	(0.01)		(0.03)	(0.02)	(0.02)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			0.02				0.02	
			(0.02)				(0.02)	
AUC	0.72	0.75	0.75	0.75	0.79	0.81	0.81	0.81
s.e.	0.05	0.05	0.04	0.05	0.04	0.04	0.04	0.04
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Country fixed effects					✓	✓	✓	✓
Observations	385	385	385	385	258	258	258	258

Notes: The table shows estimation results of a probit model from Equation 6 for financial crises, reporting mean marginal effects. The independent variables are cumulative capital flows from year $t-2$ to t. AUC is the area under the ROC-Curve, below it is its standard error. Standard errors in parentheses are clustered on country level and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

in crises identification relative to the benchmark. Column (3) includes both types of gross flows, with gross capital outflows being insignificant. Finally, column (4) shows that the single factor model of gross capital inflows has the same predictive accuracy as models including other BoP flows. In other words: neither gross outflows, nor net inflows add to the predictive power already contained in gross inflows. As some sample countries, in particular developing economies or colonies, do not report any crises for the sample period, columns (5) to (8) repeat the previous specifications including country fixed effects. While the number of observations drops sharply, the results remain robust.

To check if the results are a feature of the crisis indicator, Table A4.8 repeats the exercise using only the Reinhart and Rogoff (2009) crisis database. Although sample composition, number of crises and individual starting dates differ, the results remain virtually identical. Together, these results indicate that the information contained in gross foreign inflows best captures the capital flow dynamics that have been observed in the run-up to financial crises.

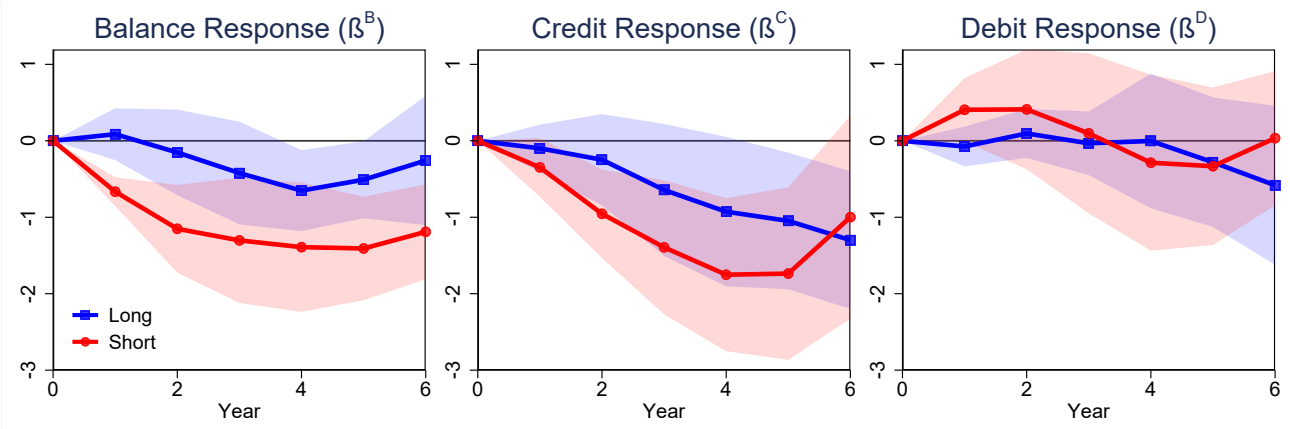
5.2. Crises, capital flight and sudden stops

Crises are preceded by large capital flows and predictive power for crises is concentrated in gross inflows. Once a crisis occurs, uncertainty in financial intermediation increases, which is followed by stops in lending, capital flight and contractions in flow volumes.[17] I explore these dynamics in the aftermath of the Great Depression, using the following specification

$$\sum_{h=1}^{n} Capital_{i,t+h}^{T} = \alpha_{i,h} + \sum_{j=0}^{2} \beta_{Cr,j}^{T,h} Crisis_{i,t-j} + \gamma^{X} X_{i,t} + u_{i,t+h}, \tag{7}$$

[17] See (Krishnamurthy and Muir, 2017; Romer and Romer, 2017; Jordà et al., 2013) for disintermediation and (Broner et al., 2013; Forbes and Warnock, 2012; Calvo, 1998) for decreasing capital flows after crises.

Figure 7: *Cumulative capital flows after crises*



Notes: This figure shows local projection responses of capital flows following financial crises, based on Equation 7. The left panel plots the response of the capital account balance, split into long- and short term capital flows. The middle and right panel do the same for credit and debit respectively. The response in the left panel can be seen to be driven by the response of decreasing gross capital inflows and increasing gross capital outflows in the middle and right panel, respectively. Standard errors are dually clustered on country and year. Shaded areas represent 90% confidence intervals.

where $\sum_{h=1}^{n} Capital_{i,t+h}^{T}$ are cumulative capital flows of Type $T \in \{Balance,\ Credit,\ Debit\}$ from year t to $t+h$. Flows are split into long and short-term flows to emphasize the difference in response time to the crisis. The $\beta_{Cr,0}^{T,h}$ coefficient measures the response of the respective flow type to a crisis in year t over the various horizons h. All specifications include country fixed effects and two lags of crises. The vector $X_{i,t}$ contains two lags of GDP growth and BoP flows.

The left panel of Figure 7 plots the response of long- and short term balances. The short-term balance immediately drops in the first year after crises, indicating a net outflow of short-term capital, and remains significantly negative at the 90% level over all horizons. The response of long-term capital is not significantly different from zero over most horizons. This response is a combination of a decrease in inflows (sudden stop), and an increase in outflows (flight). Gross inflows consistently trend downward, with long-term flows naturally taking longer to react than short-term flows. The response for outflows is less clear cut, but trends in the opposite direction after crises, with short-term flows being significantly elevated in $t+1$. Again, long-term flows take longer to react, remaining unchanged over the medium term before beginning a slow decrease. They are not significantly different from zero over any horizon.

These findings relate to Accominotti and Eichengreen (2016), who term the contraction in foreign lending during the Great Depression the "mother of all sudden stops", focusing on net capital flows. Interestingly, they time the reversal precisely to 1929, while my estimates rely on a crisis indicator which is heterogeneous across countries and might classify two consecutive years as crisis. Crucial to the timing to 1929 is a change in the bilateral relation between the world largest creditor and the world's largest debtor. Under the *transfer protection clause* of the Dawes plan, foreign investors had privileged access to German debt payments in the event of a payment crisis. In the first half of

1929, the Young plan effectively inverted the previous seniority on German payments by establishing that reparations had to be payed under any circumstances. Given Germany's position as the worlds largest net borrower, this created exposure for foreign investors, especially private US-creditors, and triggered a sharp reduction in US capital exports (Ritschl, 2014; Ritschl and Ho, 2023). My results can be seen as an expansion of these earlier results on an aggregate level, showing that while the initial reversal was triggered in 1929, the starting points of crises in individual countries remain important for capital flow dynamics around these dates.

6. Recession Severity: Aggravation and Moderation

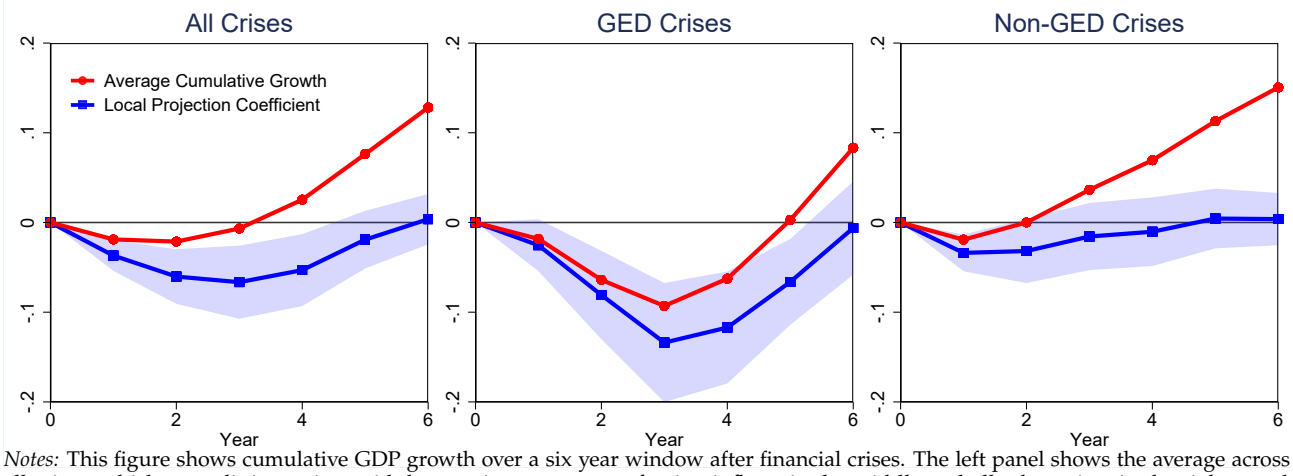
Crises are preceded by large capital movements and succeeded by capital flight and sudden stops. When a country is more reliant on foreign financing, the contraction in the availability of funds is consequently larger than for countries less reliant on foreign funds. Keynes (1941) already linked capital retrenchment to contractionary biases in borrower countries and it seems to be consensus that the overseas-disinvestment of the United States exacerbated the crisis by causing liquidity problems (Kindleberger, 1978; Eichengreen, 2008). This section provides empirical evidence that large exposure to foreign inflows before crises was followed by more severe recessions, but also that the accumulation of foreign assets provided some protection against this mechanism.

6.1. Exposure to foreign inflows before financial crises

Jordà et al. (2013) show that countries have deeper recessions after crisis when the preceding boom in domestic credit was large. Borio et al. (2014) confirm this in a case study of the Great Depression and argue that these countries were linked via large capital flows. Figure A5.7 in the appendix approaches this idea descriptively by plotting gross foreign inflows from 1927 to 1930 against log GDP growth from 1930 to 1933. A negative link between gross capital inflows and GDP growth is visible. This, however, does not account for country specific starting points of the Great Depression. The right panel addresses this concern by splitting the sample along the median recession severity in the first three years after a crisis, similar to Borio et al. (2014). Plotting average gross capital flows for both groups in a six-year window around crises reveals that countries, where the recession after a crisis was deeper than the median decline, consistently had higher gross inflows before crises, but experienced a sharper contraction in foreign inflows afterwards.

This finding corresponds to literature suggesting that sudden stops and capital flight happen after periods of elevated capital flows and that this sudden unavailability of funds during crisis is potentially harmful to the economy (Broner et al., 2013; Forbes and Warnock, 2012; Reinhart and Rogoff, 2009). To take a closer look at the economic development of countries that where exposed to

Figure 8: *Recession depth after exposure to gross capital inflows*



Notes: This figure shows cumulative GDP growth over a six year window after financial crises. The left panel shows the average across all crises, which are split into crises with large prior exposure to foreign inflows in the middle and all other crises in the right panel. High exposure crises are defined by the interaction of the GED measure from Equation 8 with a financial crisis indicator. The average cumulative GDP growth is plotted in red. Plotted in blue are estimates based on a local projection including country fixed effects and two lags of GDP growth and crises. Shaded areas represent 90% confidence intervals.

large levels of gross capital inflows before crises Equation 8 defines gross exposure as large, when gross inflows were above the yearly median in $t-1$ and $t-2$

$$GED_{i,t} = \begin{cases} 1, & \text{if } Credit_{i,t-1} > \widetilde{Credit}_{i,t-1} \ \wedge \ Credit_{i,t-2} > \widetilde{Credit}_{i,t-2} \\ 0, & \text{Otherwise.} \end{cases} \tag{8}$$

Interacting the gross exposure dummy (GED) with a crisis indicator for time t identifies crises with high previous exposure to gross inflows. This classification applies to about 25% of crises in the sample. Figure 8 shows that GDP-growth after such an inflow-crisis is much lower than for other crises over the six year window following the beginning of the crisis. Importantly, this relationship is already visible in the purely descriptive exercise of displaying the average cumulative GDP-growth after crisis, where no further estimation is involved. The corresponding graphs are plotted in red. Local projections, plotted in blue, allow me to repeat the exercise while controlling for country fixed effects and two lags of GDP-growth and financial crises. The results are confirmed, with the predictive coefficient of GDP growth for GED-crises being significantly lower than for Non-GED-crises at the 90% level at horizons 3 and 4.

To test the observation of crises being amplified by exposure to gross capital inflows more systematically, Equation 9 runs predictive regression of GDP growth from t to $t+2$ on crises interacted with the previously constructed GED measure

$$\Delta_2 y_{i,t+2} = \alpha_i + \beta^{Cr} Crisis_{i,t} + \beta^{GED} GED_{i,t} + \beta^{Cr \times GED} Crisis_{i,t} \times GED_{i,t} + \gamma^X X_{i,t} + u_{i,t+2}, \tag{9}$$

Table 4: *GDP growth, crises and exposure to gross capital inflows*

	$\Delta_2 Y_{i,t+2}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_{i,t}$	-0.05**	-0.02*	-0.01	-0.00	-0.05**	-0.02*	-0.01	-0.01
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
$GED_{i,t}$	-0.01	-0.00	0.03**	0.02*	-0.02	-0.01	0.02	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
$Crisis_{i,t} \times GED_{i,t}$		-0.08***	-0.07***	-0.07***		-0.08**	-0.07***	-0.07***
		(0.03)	(0.02)	(0.02)		(0.03)	(0.03)	(0.03)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$			-0.04***	-0.04***			-0.04***	-0.04***
			(0.01)	(0.01)			(0.01)	(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$			0.00	0.00			0.00	0.00
			(0.01)	(0.01)			(0.01)	(0.01)
$Gold\ Standard_{i,t}$				-0.03*				-0.02
				(0.02)				(0.02)
R^2	0.093	0.111	0.271	0.290	0.126	0.146	0.325	0.330
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Crisis in Sample					✓	✓	✓	✓
Observations	342	342	342	342	241	241	241	241

Notes: This table presents estimation results from Equation 9. The dependent variable is log GDP growth over the period t to $t+2$. The independent variables are a financial crisis indicator, the *GED*-variable capturing exposure to large capital inflows, the baseline BoP variables accumulated over t to $t-2$ and the Gold Standard. All specifications additionally control for country fixed effects and a two year distributed lag of GDP growth. Columns (5) to (8) restrict the sample to countries that report at least one crisis episode. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

where the dependent variable $\Delta_2 y_{i,t+2}$ again is log GDP growth. All specifications control for country fixed effects and two lags of GDP growth. Column (1) in Table 4 reports coefficients for crises and the *GED*-variable individually. The coefficient for crises is negative, while it is zero for the GED-measure. When the two are interacted in column (2), the picture is strikingly different. The interaction is larger in magnitude than the coefficient for crises and significantly negative. To make sure that the interaction does not proxy for the documented negative link between gross inflows and growth, column (3) adds the baseline BoP variables. The interaction coefficient remains unchanged, while the gross inflow coefficient is identical to the baseline. This suggests that being reliant on foreign credit before crises adds to the negative association that has been shown to persist for gross inflows and economic outcomes across all specifications. Column (4) adds the Gold Standard to control for the potential effects of restrictive monetary policy, which does not change either of the coefficients. Some countries - in particular colonies and developing economies - do not report any crises for the sample period. To make sure that the interaction does not capture countries without crises *not* being exposed to foreign inflows, columns (5) to (8) repeat the previous specifications, but restrict the sample to countries that report at least one crisis. The results remain unaffected.

Robustness: Is this result driven by the dummy classification or the choice of crisis chronology? I turn the question upside down and define the dummy not as the relatively small sample with high

exposure in two consecutive years, but instead simply take the first lag of my baseline variable (such that it does not overlap with a potential crisis in t) and define exposure as high if it is in the top 80% of the entire sample. When interacted with a crisis indicator this effectively excludes countries with low exposure, while capturing the vast majority of crises. The result is reported in Table A5.9 and shows that focusing on the exclusion of low exposure countries produces very similar results. In Table A5.10 I re-estimate Table 4 using the Reinhart and Rogoff (2009) crisis dating. The results remain unchanged. Together, these result confirm that exposure to gross inflows prior to crises adds to the negative link between gross inflows and economic outcomes.

6.2. Accumulation of foreign assets before financial crises

The accumulation of foreign debt in one country implies the accumulation of foreign assets in another. Similarly, capital flight during crises implies the repatriation of foreign assets by another country, which now experiences capital inflows. Potentially, the inflow of capital, due to retrenchment, even outweighs the flight of foreign capital. While gross foreign credit decreases, some countries may cushion the effect on their economy by the repatriation of their own foreign assets (Caballero and Simsek, 2020). Contrary to recessions being more severe due to foreign credit exposure, this channel proposes the moderation of recessions via the liquidity insurance provided by foreign assets.

In Table 5 I define a dummy for the accumulation of gross foreign assets (GFA) analogously to the GED-measure. It takes the value 1, if gross outflows were above the yearly median in $t-1$ and $t-2$. Its interaction with crises in column (2) is positive, providing evidence for the hypothesis that foreign assets can dampen the effects of crises. Assuming that the boom before crisis splits countries into capital ex- and importers, GFA and GED might capture the same information, showing on the one hand that gross importers fare worse and on the other that gross exporters fare better. Including capital flow variables and the GED-crisis interaction in (3), however, reveals that the two channels are independent from each other. This corresponds to the model in Caballero and Simsek (2020), where it is possible for a country to be adversely affected by exposure to inflows, but simultaneously benefit from its own foreign assets. To verify that it is not ultimately the net availability of funds in a crisis that drives these effects, column (4) interacts a dummy for positive net inflows in year t (NID) with crises. The coefficient is positive, confirming that the net availability of funds during crises matters. It does, however, not affect the other coefficients.[18] Column (5) adds the interaction of crises with the Gold Standard, showing that neither result proxies for Gold Standard adherence. Columns (6) to (8) restrict the sample to countries with at least one crisis, again with unchanged results.

The positive effect of foreign assets is less pronounced than the negative effect of foreign liabilities. It is generally of lower magnitude and statistical significance. Under the assumption that they are

[18] Naturally, the coefficient has to be cautiously interpreted since it might be impacted by the crisis in the same year.

Table 5: *Crisis moderation via foreign asset accumulation*

	$\Delta_2 Y_{i,t+2}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crises3	-0.05**	-0.07***	-0.03	-0.06***	-0.05**	-0.07***	-0.06***	-0.05***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
$GFA_{i,t}$	-0.00	-0.01	0.01	0.01	0.01	0.00	0.02*	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Crisis_{i,t} \times GFA_{i,t}$		0.05*	0.04**	0.05**	0.04*	0.04**	0.04**	0.03*
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$Crisis_{i,t} \times GED_{i,t}$			-0.07***	-0.07***	-0.07***		-0.06**	-0.06**
			(0.03)	(0.03)	(0.02)		(0.03)	(0.03)
$Crisis_{i,t} \times NID_{i,t}$				0.05**	0.05**		0.05**	0.05**
				(0.02)	(0.02)		(0.02)	(0.02)
$Crisis_{i,t} \times Gold_{i,t}$					-0.02			-0.02
					(0.04)			(0.04)
R^2	0.090	0.096	0.278	0.286	0.307	0.125	0.349	0.356
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Capital Flow Controls			✓	✓	✓		✓	✓
Crisis in Sample						✓	✓	✓
Observations	342	342	342	342	342	241	241	241

Notes: This table presents estimation results from altering Equation 9 to include additional sets of interaction terms. The dependent variable is log GDP growth over the period t to $t+2$. The independent variables are a financial crises indicator and its interaction with the accumulation of gross foreign assets (GFA), gross exposure to foreign credit (GED), net capital inflows in year t (NID) and Gold Standard adherence (Gold). The individual terms of each interaction are always included in the specification. The baseline capital flow variables from the BoP, accumulated over t to $t-2$, are included when indicated. All specifications control for country fixed effects and a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

perfect substitutes for each other, and considering that their volumes across the whole sample are identical, their coefficients should outweigh each other. A potential explanation for the discrepancy lies in the reason why foreign funds return home during crisis. For the positive effect of repatriated assets to fully counter the withdrawal of foreign funds, all repatriated funds would need to be re-employed domestically. This, however, is unlikely, as theoretical models suggest that during crises the need for precautionary savings increases, depressing aggregate demand (Guerrieri and Lorenzoni, 2017). Instead, it is more likely that they are repatriated due to increased caution and put into domestic savings accounts. Empirically, Degorce and Monnet (2020) find that during the Great Depression the reluctance to invest or consume led to an increase in precautionary savings. In the context of capital flows, this suggests that repatriated assets are only partially channeled back into the domestic economy. This cushions the shock of foreign capital being withdrawn, but cannot fully substitute for it.[19]

[19]This argument is also consistent with the 'paradox of thrift' (Keynes, 1936), where an increase in savings does not translate into increased output because it depresses aggregate demand. This leads to the paradox where increased savings today lead to lower total savings in the long run.

7. Instrumental Variable Results

Borrowing against future fundamentals or searching for external funds to finance investment is unlikely to have adverse aggregate effects. Instead it is the foreign supply of funding, unrelated to the domestic economy, that likely drives the negative association between foreign inflows and economic downturns (Rey, 2013; Miranda-Agrippino and Rey, 2020). This section proposes two instrumental variable approaches to identify the component of capital inflows being driven by foreign supply, which cannot be independently observed in the Balance of Payments. Following this line of reasoning, the baseline coefficient should be downward biased, because it cannot distinguish between capital supply and demand. A working instrument that succeeds in identifying foreign capital supply should consequently lead to an upward correction of the OLS coefficient.

7.1. The United States as a creditor nation

The baseline instrumental variable exploits the special role of the United States, which had become the world's greatest creditor nation during the boom years of the Roaring Twenties. This fact, well appreciated by contemporaries, resulted in a magnitude of publications addressing the American role in world finance, and trying to assess how large the American investment position abroad actually was.[20] Later scholars observed the change from 'debtor to creditor nation' as America becoming the 'world's banker' (Woodruff, 1975). When the United States drastically reduced their foreign lending during the Great Depression, countries that were previously subject to most capital inflows from the US, consequently now experienced the most severe reduction in available foreign capital. To empirically test this line of reasoning, I collect data from Dickens (1931, 1930) and Lewis and Schlotterbeck (1938), and construct the bilateral portfolio investment position of the United States with individual countries.

To highlight the significance of US capital for domestic financial systems, I compute 'pass-through' coefficients to domestic bank balance sheets using newly collected data from the League of Nations (1931-1940) These coefficients, in Table A6.11, assess the marginal importance of US-capital inflows and indicate that one additional dollar of US portfolio investment was, on average, associated with an increase of 0.97 dollars in domestic balance sheet size. Further analysis, building on the method developed in Eren et al. (2023), reveals that out of this 0.97$ increase, 0.45$ is lent as domestic credit, and 0.35$ is used by banks to acquire securities.[21] All three 'pass-through' coefficients are highly statistically significant. This confirms a direct connection between US portfolio investments and the

[20] See for example: Dickens (1931, 1930) and Lewis and Schlotterbeck (1938) for data collection and Jolliffe (1935) for a more narrative approach.

[21] For comparison, an additional dollar of gross foreign credit as recorded in the BOP is only associated with a 30 cent increase in domestic bank balance sheet size. This is because gross inflows also include transactions less likely to pass through domestic balance sheets, such as foreign direct investment, land purchases, and trade credits.

financial systems of recipient countries, with the majority of US funds providing liquidity to credit and financial markets. To express the importance of US capital in relative terms, Figure A6.8 plots the ratio of the US portfolio position to domestic bank balance sheets over time for Germany, the UK, France, and Japan. Although magnitudes and pre-crisis trends vary, this ratio sharply declines in all four countries from 1931/32 onward, indicating that the US portfolio position contracted more rapidly than domestic bank balance sheets during that period.

Having established a link from US foreign investments to domestic financial conditions, I now turn to the economic relevance of having strong financial ties to the United States. Concretely, I regress three year future GDP growth on the lagged ratio of US portfolio investments to domestic bank balance sheet size for every year between 1923 and 1934 individually. The results in Figure A6.9 show that closer financial ties to the US during the expansionary years before and after the Great Depression are positively associated with domestic GDP growth. This relationship, however, turns significantly negative towards the end of the 1920s and the onset of the Great Depression, showing that exposure to potential US capital withdrawals had adverse effects on the economy.

7.2. A Bartik-Style instrument

Arguably, the flight of US capital from (or supply to) any individual country is driven as much by that country's economic conditions as by the United States' willingness to invest abroad. The aggregate withdrawal (or expansion) of foreign investments by the United States, however, is more likely to be driven by decisions taken in the United States rather than their individual partner countries. To exploit this variation in foreign inflows not driven by economic conditions of specific countries, but by changing conditions in the United States (like the 1920s boom and 1930s bust), I construct a Bartik-style instrument (Bartik, 1991) and use it to instrument the capital inflows of other countries. Specifically, I interact exposure to US portfolio investments in 1927 with the change in the total US portfolio position. To minimize potential endogeneity with domestic economic conditions, the change in the total US portfolio position is computed as excluding changes in investments to the instrumented country i. The key identifying assumption here is that the pre-existing exposure measure for individual countries is exogenous to the aggregate developments (excluding i) in period t (Goldsmith-Pinkham et al., 2020). Equation 10 shows the construction of the instrument

$$Interaction\ IV_{i,t} = \frac{USP_{i,1927}}{BBS_{i,1927}} \times \sum_{i \neq j} \Delta USP_{j,t}, \tag{10}$$

where $USP_{i,1927}$ is the United States' portfolio position in country i in 1927, scaled by that countries bank balance sheet size $BBS_{i,1927}$.[22] This exposure is time invariant which leaves the second term to

[22] 1927 is chosen as it is the first year for which comprehensive data is available for many countries. The specification

create variation in the instrument. This second term is the total change in the US portfolio position, excluding the instrumented country i to make sure that US capital supply is not conflated with capital demand by country i. Finally, I normalize the instrument to make the reduced form coefficients comparable to the coefficients obtained from Balance of Payments variables.

The first stage of this instrument is shown in a scatterplot against gross foreign inflows in Figure A6.10. The relation between the two variables is, in line with intuition, strongly positive and gets strengthened upon the inclusion of control variables and country fixed effects in the second panel. I now fix the sample to the observations where both the instrument and the BoP variables are available, which reduces the total number of observations to around 200, and report OLS coefficients together with reduced form and instrumented estimates in Table 6.

The table mirrors the baseline table with increasing forecast horizons of GDP over the different specifications. The independent variables, however, are reduced to yearly capital inflows to correspond to the time horizon of the instrument. Across all horizons, the reduced form and especially the instrumented coefficients are larger than the baseline OLS-coefficients and highly significant. The Kleibergen-Paap statistic of around 25 further confirms the visual impression of a good first-stage fit. Together, this confirms the intuition of a baseline bias towards zero, when domestic demand and foreign capital supply cannot be distinguished. As the number of observations is reduced, due to limited data availability before 1927, I re-estimate the previous table with exposure to the US being re-defined as the average bilateral US portfolio position (relative to bank balance sheet size) over the last two years, instead of 1927. While this increases the number of observations by allowing the inclusion of data points before 1927 wherever available, it opens up the possibility of variation in the instrument also being driven by changes in the exposure measure. Being aware of this trade-off, I report this alternative specification in Table A6.12. The displayed estimates confirm the previous results in a larger sample.

Robustness: A potential caveat of this approach is that it might be too US-centric, given that the United States had only just overtaken the United Kingdom as the primary creditor country. To model the global supply of capital in a more general way, I therefore follow Aldasoro et al. (2020), who construct a measure of the Global Financial Cycle using principal component analysis.[23] This global cycle is unrelated to the capital demand of individual countries and thus helps to isolate the component of capital inflows being driven by foreign capital supply. Trying to minimize the endogeneity of the global cycle to any individual country, I estimate it for every country individually as the first principal component of capital inflows over all countries, excluding country i itself.

provides similar estimates when choosing earlier years, which reduces the sample along the cross-sectional dimension, as well as later years, which reduces the sample along the time dimension.

[23] The concept of the GFC was pioneered by Rey (2013) and describes a situation where global financial conditions spill over into domestic economies, irrespective of the domestic financial cycle (Rey, 2013; Miranda-Agrippino and Rey, 2020; Aldasoro et al., 2020).

Table 6: *Gross foreign inflows and GDP dynamics, Bartik-style instrument*

	$\Delta_2 Y_{i,t+2}$			$\Delta_3 Y_{i,t+3}$			$\Delta_4 Y_{i,t+4}$		
	OLS (1)	*Reduced* (2)	*IV* (3)	*OLS* (4)	*Reduced* (5)	*IV* (6)	*OLS* (7)	*Reduced* (8)	*IV* (9)
$Credit_{i,t}$	-0.03***		-0.07***	-0.05***		-0.11***	-0.04***		-0.14***
	(0.01)		(0.02)	(0.01)		(0.02)	(0.02)		(0.02)
Interaction IV		-0.04**			-0.07***			-0.07***	
		(0.02)			(0.02)			(0.02)	
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap Weak ID			24.88			26.88			23.83
Observations	201	201	201	201	201	201	192	192	192

Notes: This table presents OLS, reduced form and instrumented coefficients for a regression of log GDP growth between t and $t+h$ on gross foreign inflows at time t. The instrument is constructed as described in Equation 10 and used to instrument gross inflows in columns (3), (6) and (9). Reduced form and instrumented coefficients are larger than OLS-coefficients, suggesting a baseline bias towards zero. All specifications control for country fixed effects, a two year distributed lag of GDP growth and net capital flows. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

While this constructed global cycle is certainly not fully exogenous to any individual country, I argue that it still goes some way isolating the global supply of capital, as it seems unlikely that the capital inflows of all other countries are strongly influenced by the inflows of the omitted country i. To accurately resemble the baseline specification, I calculate normalized three year sums of the *GFC*-measure, identical to the BoP variables, and establish the relevance of the instrument in a first stage scatterplot in Figure A6.11. It shows a strong positive correlation that is robust to the inclusion of country fixed effects and control variables. I again fix the sample to observations where the instrument is available and instrument gross capital inflows with the *GFC*-measure in Table A6.13 in the appendix. The reduced form and especially the instrumented coefficients are again larger than the baseline OLS-coefficients and highly significant across all horizons, confirming the intuition of a baseline bias towards zero.

8. The Gold Standard, Foreign Interest Payments and Findings in Modern Data

The previous chapters have shown that foreign inflows revert after crises, and reliance on them before amplifies post-crisis recessions. Additionally, it is particularly the foreign supply of capital, unrelated to domestic economic conditions, which drives the documented negative relationship between borrowing abroad and adverse economic outcomes. But what exposes countries to these inflows in the first place, and does it matter for outcomes if countries have the option to respond to increasing inflows? To answer this question, this chapter first explores how capital inflows increased upon Gold Standard adoption and how the Gold Standard simultaneously limited the tools to respond to them. It then considers that borrowing from abroad today comes with interest payments to foreigners tomorrow, showing that these interest payments are negatively related to future growth

prospects. Finally, I explore if these findings from the interwar period can help us understand the link between capital flows and business cycles also for more recent times. I re-estimate the paper's main specifications using modern data for OECD-economies and show that coefficients are remarkably similar across samples.

8.1. The Gold Standard

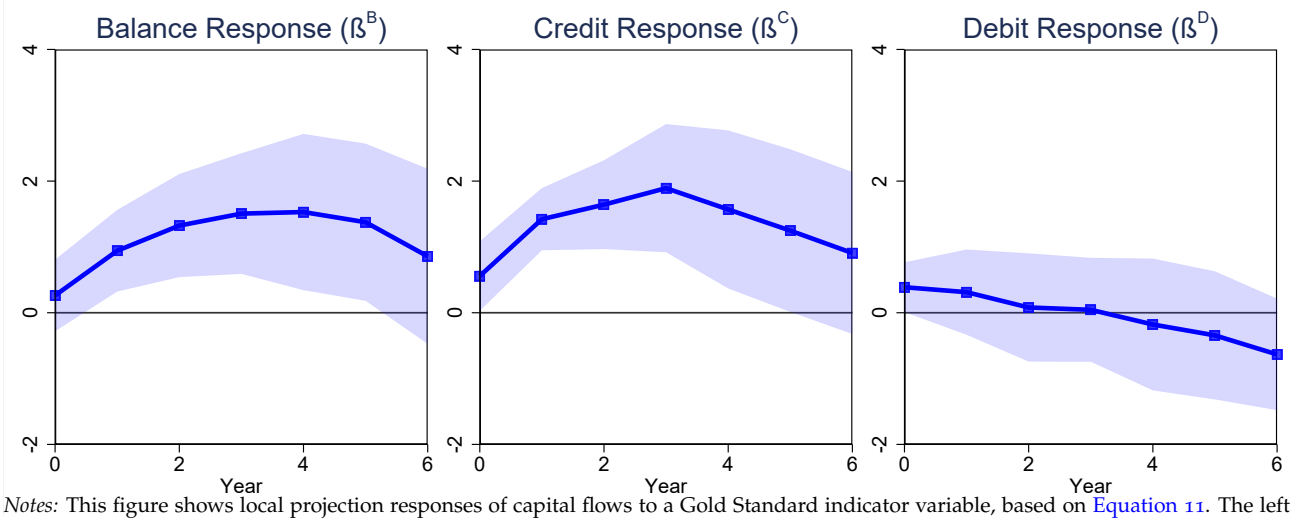
The Gold Standard was a commitment to the free flow of capital, reduced risk in international lending relations and fostered financial integration via the common peg to gold (Bordo and Kydland, 2005; Wandschneider, 2008; James, 1992; Eichengreen, 2008). This increased access to international financial markets and, conversely, created a multitude of potential destinations for foreign investments. To estimate the contribution of Gold Standard adoption to the observed boom in international capital flows, Equation 11 runs local projections of capital flows on a Gold Standard dummy variable

$$\sum_{h=0}^{n} Capital_{i,t+h}^{T} = \alpha_{i,h} + \sum_{j=0}^{2} \beta_{G,j}^{T,h} Gold_{i,t-j} + \sum_{j=1}^{2} \beta_{j}^{T,h} Capital_{i,t-j}^{T} + \gamma^{X} X_{i,t} + u_{i,t+h}. \tag{11}$$

Here $\sum_{h=0}^{n} Capital_{i,t+h}^{T}$ are cumulative capital flows from year t to $t+h$ of type T, where $T \in \{Balance, Credit, Debit\}$. *Gold* refers to a Gold Standard indicator that is included for years t to $t-2$. Ultimately of interest is the $\beta_{G,0}^{T,h}$ coefficient for all capital flow types across horizons $h = 0, ..., 6$. Estimations for gross capital flows include two lags of both credit and debit, while estimations for the balance include two lags of the capital account balance. The vector $X_{i,t}$ contains two lags of GDP growth. The results are reported in Figure 9. They show that upon Gold Standard adoption, net capital inflows increase, and that this effect is exclusively driven by the increase in gross capital inflows, shown in the middle panel. The increase in inflows is positively significant between horizons 1 and 5, with gross foreign inflows cumulatively increasing by about 1.5 standard deviations. The results for gross outflows are insignificant over all horizons.

Under the Gold Standard, gross capital inflows increase and gross inflows precede periods of lower growth. Increasing inflows, however, might be due to a Gold Standard mechanism, rather than increased financial integration. The functioning of the monetary system in Gold Standard countries is dependent on the availability of gold (Eichengreen, 1996; Bernanke, 2009). This availability in turn is determined to a large extent by the net in- and outflow of physical gold. If the gross inflow of capital is tied to foreigners trying to acquire gold, which is then moved out of the country, inducing contractionary pressure, the negative link between capital inflows and GDP growth would proxy for a Gold Standard mechanism. Table A7.14 in the appendix shows that the baseline specification is robust to the inclusion of gold flows in various sub-samples, including a sample restricted to observations within the Gold Standard. The Gold Standard mechanism, where the outflow of physical gold is

Figure 9: *Cumulative capital flow in response to Gold Standard adoption*



Notes: This figure shows local projection responses of capital flows to a Gold Standard indicator variable, based on Equation 11. The left panel plots the response of the capital account balance, the middle and right panel do the same for credit and debit respectively. The response in the left panel can be seen to be driven by the response of increasing gross capital inflows in the middle panel. The response of debit in the right panel is flat, indicating that the Gold Standard exposed countries to inflows from abroad, while capital exports saw little change. Standard errors are dually clustered on country and year. Shaded areas represent 90% confidence intervals.

negatively associated with future growth, can be observed in a single factor model including only gold flows, with the sample restricted to Gold Standard countries before 1933.[24]

Internationally, the Gold Standard enabled financial integration and contributed to increased exposure to foreign capital inflows. But the magnitude of the relationship between inflows and the macroeconomy is contingent on the domestic dimension of the Gold Standard. Under the open economy trilemma, the Gold Standard restricted the abilities of domestic policy makers to counter the effects of inflows via monetary policy, capital flow management or exchange rate adjustments. This effectively translated into a situation where the rules of the Gold Standard created exposure to global credit, but left countries unable to adequately respond to it. In line with this Obstfeld et al. (2004) argue that the '*inability to pursue consistent policies in a rapidly changing economic environment*' makes the trilemma one of the key factors in understanding the interwar crisis. Column (1) of Table 7 interacts a dummy for not being on gold for the duration of capital inflows in the *Credit* variable between t and $t-2$ with gross inflows. The interaction coefficient is positive, of similar magnitude to the *Credit* coefficient and statistically significant. In columns (2) and (3) I control for net inflows and gross outflows respectively, which does not change the results in any way. This suggests that the option to react to foreign inflows matters for the magnitude of their effects.

Davis et al. (2016) emphasize that an open capital account is important for current account deficits

[24]The only countries that continued to hold onto gold after 1933 were the gold block countries, led by France, which had gold reserves large enough to effectively not having to fear falling below their coverage threshold. As the mechanism of gold being linked to lower growth is only binding when countries are approaching the lower bound of their gold coverage, including these countries after 1933 produces no significant coefficient for gold flows. For a discussion of the gold blocks adherence to gold and its eventual dissolution see: Bordo and Edelstein (1999); Madsen (2001); Hallwood et al. (2007); Eichengreen and Irwin (2010).

Table 7: *Capital flows, the Gold Standard and capital account openness*

	$\Delta_2 Y_{i,t+2}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.04***	-0.04***	-0.05***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times No\ Gold_{i,t\to t-2}$	0.03*	0.03**	0.03**						
	(0.02)	(0.02)	(0.02)						
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times Closed\ (<100)_{i,t\to t-2}$				0.04**	0.04**	0.04**			
				(0.02)	(0.02)	(0.02)			
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times Closed\ (<67)_{i,t\to t-2}$							0.05**	0.05**	0.05**
							(0.02)	(0.02)	(0.02)
R^2	0.274	0.274	0.277	0.409	0.409	0.409	0.383	0.383	0.383
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Net Capital Inflows		✓			✓			✓	
Gross Outflows			✓			✓			✓
Observations	342	342	342	234	234	234	234	234	234

Notes: This table presents estimation results from interacting gross capital inflows with measures for Gold Standard adherence and capital account account openness. The dependent variable is log GDP growth from t to $t+2$. Columns (1) to (3) interact gross inflows with a dummy for not being on gold between t and $t-2$. Columns (4) to (6) perform a similar interaction with a dummy for the capital account being less than 100 percent open, based on the Quinn (2003) capital account openness measure. Columns (7) to (9) repeat the specification for capital account openness being in the lower two thirds. The interaction terms are also included individually in all specifications. All specifications control for country fixed effects and lagged growth refers to a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

(a net measure) to have adverse domestic effects, and Quinn (2003) finds evidence for countries with more open capital accounts having deeper recessions during the Great Depression. Following this reasoning I interact gross inflows with a dummy for the capital account being less than completely open (below 100%) between t and $t-2$.[25] The interaction coefficient again is positive, significant and slightly larger than the previous interaction with Gold Standard adherence. I repeat the specification with an indicator for capital account openness being below 66% (less open), with the result that the interaction coefficient again slightly increases in magnitude. Together, this implies that capital account management, which was only possible outside the Gold Standard, can help moderate the negative implications of foreign inflows. The similarity in results between the Gold Standard and the capital account measure also relates to Mitchener and Wandschneider (2015), where the authors find that leaving gold led to capital controls, while the option for independent monetary policy was underutilized. For robustness, Table A7.15 reports the full set of interactions for all included BoP variables with the various openness measures. The results remain unchanged.

8.2. Interest payments to foreign creditors

Borrowing today comes with interest payments in the future. What is peculiar about borrowing from abroad is that these interest payments will flow to foreigners. This has long been acknowledged as a

[25] I use the capital account openness measure from Quinn (2003), which is highly correlated with the Gold Standard. During the Gold Standard, the average openness score is 93, versus only 49 outside of it.

Table 8: *Foreign credit, interest payments to foreigners and economic growth*

	$Interest\ Payments_{i,t+1}$			$\Delta_2 Y_{i,t+2}$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	0.48***	0.40***	0.50***			
	(0.09)	(0.09)	(0.10)			
$\Sigma_{j=0}^{2} Balance_{i,t-j}$		0.12*				
		(0.07)				
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			-0.08			
			(0.07)			
$Interest\ Payments_{i,t}$				-0.04***	-0.04***	-0.04***
				(0.01)	(0.01)	(0.01)
$Net\ Interest\ Payments_{i,t}$					-0.00	-0.00
					(0.01)	(0.01)
$Credit_{i,t}$						-0.01**
						(0.00)
R^2	0.250	0.259	0.257	0.246	0.248	0.259
Country fixed effects	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓
Observations	330	330	330	325	325	325

Notes: This table shows in columns (1) to (3) that interest payments to foreigners in $t+1$ increase in past gross foreign inflows. In columns (4) to (6) the dependent variable is log GDP growth from t to $t+2$, which is shown to be negatively related to interest payments fo foreigners in t. All specifications control for country fixed effects and two lags of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

drain on national income since it represents the transfer of wealth abroad (Lerner, 1948). More recent authors phrase a similar insight in terms of the different marginal propensities to consume out of additional income between creditors and debtors. In this view, economic activity is suppressed when debtors are financially constrained and creditors have a lower marginal propensity to spend their additional income, resulting in an aggregate loss in demand (Eggertsson and Krugman, 2012). In the case of foreign creditors, this condition likely applies since foreigners presumably have a low propensity to spent their additional income in the countries of their debtors.

My data allows me to directly test the implication of this argument in the context of the Balance of Payments. While gross foreign inflows are recorded in the capital account, the current account, on the other side of the balance, contains information on "interest and dividends paid to foreigners". Column (1) in Table 8 confirms the intuition that interest payments to foreigners in $t+1$ increase in past foreign borrowing, indicated by the baseline *credit* variable. In columns (2) and (3) I confirm that this is not a spurious link between two Balance of Payments variables by including net inflows and gross outflows. Past net inflows also have a slightly positive relationship with future interest payments, which makes sense conceptually, since the net inflow of capital ultimately relies on the gross inflow of capital. Further confirming the link between inflows and interest payments is the coefficient for gross outflows in (3) which is closest to zero and statistically insignificant. The inclusion of either variable does not meaningfully change the coefficient for *credit*.

Column (4) tests the second part of the argument, where interest payments to foreigners are assumed to have a negative relationship with future growth, due to a wealth transfer abroad. Here, a high level of interest payments in t is linked to future growth, which indeed produces a large and significantly negative relationship. This negative relationship might be offset if a country in turn receives interest payments on its own foreign lending. Column (5) therefore includes the net interest payments to foreigners, which does not change the coefficient for gross payments in any way. Finally, column (6) includes gross inflows at time t to make sure the negative coefficient is not driven by a mechanical link between current and capital account items within the Balance of Payments. Again, the result for interest payments remains unchanged. The coefficient for credit, despite only covering one year of inflows, retains its negative significance. It is, however, reduced, suggesting that part of the negative effect of foreign borrowing on business cycle dynamics can indeed be explained by interest payments to foreigners.

8.3. Findings in modern data

A question remains: how much of the above is a peculiarity of the interwar period, despite its alignment with economic intuition and theory? To address this question I use the OECD (2022) BoP data from the early 1970's until 2020 with about twice as many observations as the interwar sample in an exercise similar to Broner et al. (2013). To confirm the basic BoP mechanics, Figure A7.12 runs local projections for the OECD-sample, corresponding to the specification in Figure 5. If anything, the results are even more pronounced in the modern sample. Table A7.16 replicates the baseline from Equation 5 using the OECD-dataset. It shows that cumulative capital flows from t to $t-2$ retain their predictive ability, with coefficients and R^2 being close to identical to the interwar period. Again, neither gross outflows, nor net capital inflows, show any significance once gross capital inflows are included in the model. Columns (5) to (8) repeat the specifications for the combined sample, now containing over 1000 observations, with identical results.

Table A7.17 uses the combined OECD and League of Nations sample, containing over 70 crises episodes (crisis dating for the OECD sample also relies on the Baron et al. (2021) database), in a probit model. Gross capital inflows again emerge as the most significant predictor of crises. The predictive power, indicated by the AUC, of models containing more than gross capital inflows does not increase when compared to models including only gross capital inflows. Table A7.18 tests if the result of crises being more severe after previous exposure to gross capital inflows holds in the combined sample, using the GED-measure. Once again the results are strikingly similar to the interwar period, with the interaction of crises and previous exposure to gross capital inflows adding to the negative link between gross inflows and economic performance.

9. Conclusion

The Great Depression as the pivotal event of the interwar years has been studied by innumerable scholars. The classical perspective on by what it was preceded, how it played out and by what it was followed, however, seems to be remarkably consensual (James, 1992). This paper shows that the established approach from the perspective of international finance, centering on the Gold Standard and net capital flows, can be recreated with novel data from the League of Nations, but also that this approach needs to be expanded. Telling the story of the boom-bust dynamics around the Great Depression requires talking about the boom in gross international credit that went bust.

Gross capital inflows are decisive for adverse economic outcomes in the future. They link international capital flows to economic downturns, financial crises and are an important factor for the severity of recessions after crises. This is due to international credit exposing countries to global uncertainty and being prone to capital flight after crises. This relationship cannot fully be picked up when focusing on net-capital flows, as they can neither capture the buildup of foreign debt positions, nor is it possible that a majority of countries experiences net capital flight at the same time. These results hold in a battery of robustness checks, including instrumental variable specifications and an external sample of OECD economies since the 1970's.

Together, my results can be considered as a variation of the Golden Fetters argument (Eichengreen, 1996), because the Gold Standard was instrumental in exposing a country to the documented dynamics via increasing its integration into the global financial system. Simultaneously, it deprived countries of the tools to counter the adverse effects of foreign credit. Not being on the Gold Standard consequently meant having the option of introducing capital account management, which partially protected countries from the adverse effects of gross foreign credit.

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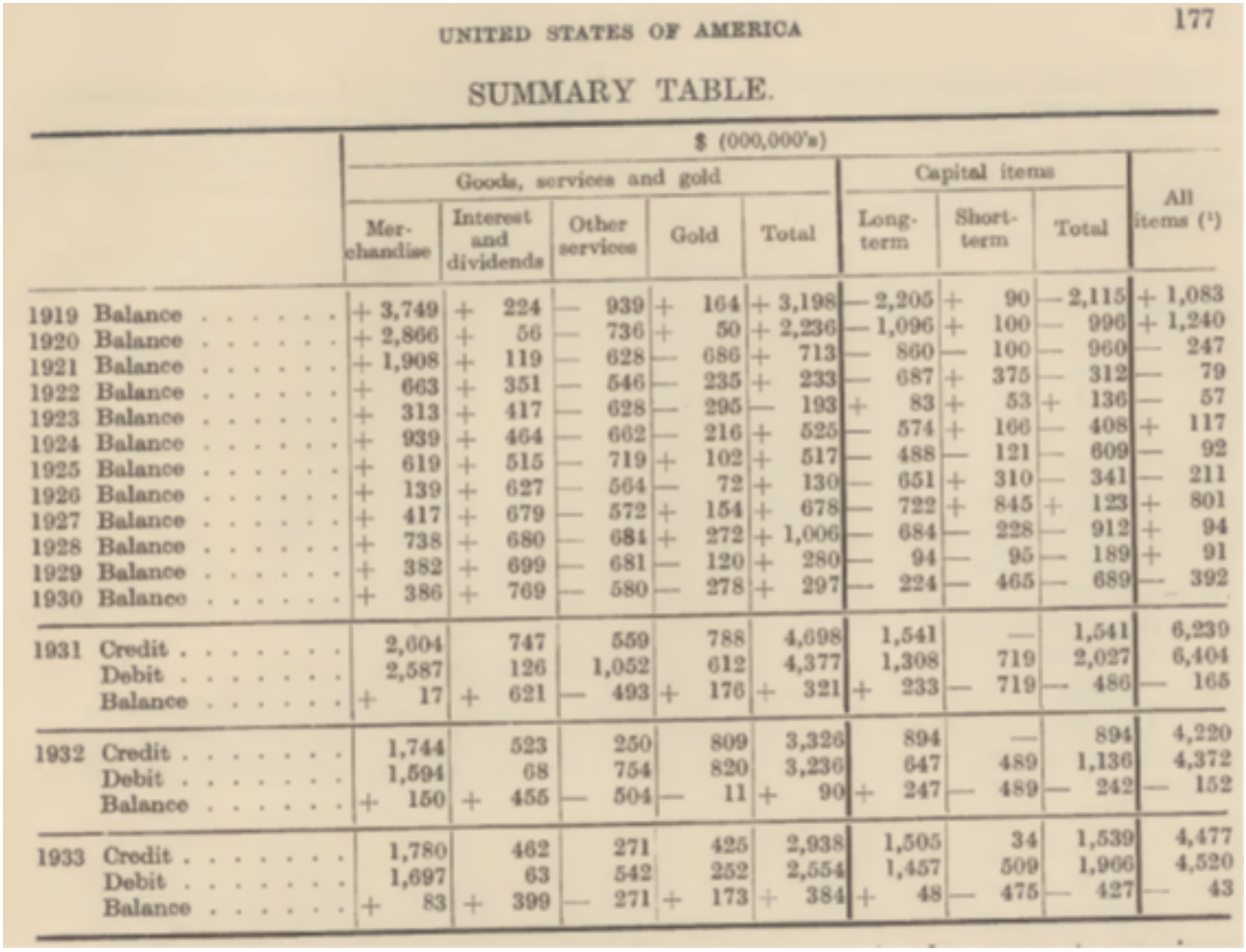
Appendix

Golden Fetters or Credit Boom Gone Bust?
A Reassessment of Capital Flows in the Interwar Period

A. Appendix

A1. The Balance of Payments

Figure A1.1: *Balance of Payments original data example, United States*



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SUMMARY TABLE.

	$ (000,000's)								
	Goods, services and gold					Capital items			All items (1)
	Merchandise	Interest and dividends	Other services	Gold	Total	Long-term	Short-term	Total	
1919 Balance	+ 3,749	+ 224	— 939	+ 164	+ 3,198	— 2,205	+ 90	— 2,115	+ 1,083
1920 Balance	+ 2,866	+ 56	— 736	+ 50	+ 2,236	— 1,096	+ 100	— 996	+ 1,240
1921 Balance	+ 1,908	+ 119	— 628	— 686	+ 713	— 860	— 100	— 960	— 247
1922 Balance	+ 663	+ 351	— 546	— 235	+ 233	— 687	+ 375	— 312	— 79
1923 Balance	+ 313	+ 417	— 628	— 295	— 193	+ 83	+ 53	+ 136	— 57
1924 Balance	+ 939	+ 464	— 662	— 216	+ 525	— 574	+ 166	— 408	+ 117
1925 Balance	+ 619	+ 515	— 719	+ 102	+ 517	— 488	— 121	— 609	— 92
1926 Balance	+ 139	+ 627	— 564	— 72	+ 130	— 651	+ 310	— 341	— 211
1927 Balance	+ 417	+ 679	— 572	+ 154	+ 678	— 722	+ 845	+ 123	+ 801
1928 Balance	+ 738	+ 680	— 684	+ 272	+ 1,006	— 684	— 228	— 912	+ 94
1929 Balance	+ 382	+ 699	— 681	— 120	+ 280	— 94	— 95	— 189	+ 91
1930 Balance	+ 386	+ 769	— 580	— 278	+ 297	— 224	— 465	— 689	— 392
1931 Credit	2,604	747	559	788	4,698	1,541	—	1,541	6,239
Debit	2,587	126	1,052	612	4,377	1,308	719	2,027	6,404
Balance	+ 17	+ 621	— 493	+ 176	+ 321	+ 233	— 719	— 486	— 165
1932 Credit	1,744	523	250	809	3,326	894	—	894	4,220
Debit	1,594	68	754	820	3,236	647	489	1,136	4,372
Balance	+ 150	+ 455	— 504	— 11	+ 90	+ 247	— 489	— 242	— 152
1933 Credit	1,780	462	271	425	2,938	1,505	34	1,539	4,477
Debit	1,697	63	542	252	2,554	1,457	509	1,966	4,520
Balance	+ 83	+ 399	— 271	+ 173	+ 384	+ 48	— 475	— 427	— 43

Notes: This figure shows a snapshot of a Typical Balance of Payments table for the United States, newly digitized for this paper. It is taken from the 1934 publication of the League of Nations (1933-1939). Coverage and quality of data may differ across countries and time.

Table A1.1: *Coverage of Balance of Payments variables*

Country	Balances	CaA Credit & Debit	CuA Credit & Debit	CaA Components	CuA Components
Albania	1926-1933	1926-1933	1926-1933	1926-1933	1926-1933
Argentine	1921-1938	1921-1938	1921-1938	1921-1938	1921-1938
Australia	1922-1936	1922-1936	1922-1936	1922-1936	1922-1936
Austria	1923-1936	1925-1936	1925-1929	1925-1936	1925-1929
Belgium & Luxemburg	1929-1937	1929-1937	1934-1937	1929-1937	1934-1937
Bulgaria	1924-1936	1924-1936	1924-1936	1924-1936	1924-1936
Canada	1920-1938	1925-1938	1920-1938	1925-1938	1920-1938
China	1928-1937	1928-1937	1928-1937	1928-1937	1928-1937
Cyprus	1933-1937	1933-1937	1933-1937	1933-1937	1933-1937
Czechoslovakia	1925-1937	1925-1937	1925-1937	1925-1937	1925-1937
Denmark	1923-1938	1923-1938	1923-1938	1923-1938	1923-1938
Dutch East Indies	1925-1938	1925-1938	1925-1938	1925-1938	1925-1938
Estonia	1925-1938	1925-1938	1925-1938	1925-1938	1925-1938
Finland	1922-1938	1926-1938	1922-1938	1926-1938	1922-1938
France	1921-1938	1921-1938	1927-1938	1921-1938	1927-1938
Germany	1924-1937	1924-1937	1924-1937	1924-1937	1924-1937
Greece	1929-1938	1929-1938	1929-1938	1929-1938	1929-1938
Hungary	1923-1936	1923-1936	1923-1936	1923-1936	1923-1936
India	1923-1938	1923-1938	1923-1938	1923-1938	1923-1938
Ireland	1924-1938	1924-1938	1924-1938	1924-1938	1924-1938
Japan	1924-1936	1924-1936	1924-1936	1924-1936	1924-1936
Latvia	1923-1937	1923-1937	1923-1937	1923-1937	1923-1937
Lithuania	1924-1937	1924-1937	1924-1937	1924-1937	1924-1937
Netherlands	1923-1938	1923-1938	1926-1938	1923-1938	1926-1938
New Zealand	1923-1937	1923-1937	1923-1937	1923-1937	1923-1937
Norway	1923-1938	1923-1938	1923-1938	1923-1938	1923-1938
Poland	1923-1937	1923-1937	1923-1937	1923-1937	1923-1937
Romania	1926-1930	1926-1930	1926-1930	1926-1930	1926-1930
Surinam	1925-1938	1925-1938	1925-1938	1925-1938	1925-1938
Sweden	1923-1938	1923-1937	1923-1937	1923-1937	1923-1937
Thailand	1923-1937	1932-1937	1923-1937	1932-1937	1923-1937
Turkey	1926-1933	1926-1933	1926-1933	1926-1933	1926-1933
Union of South Africa	1923-1937	1923-1937	1923-1937	1923-1937	1923-1937
United Kingdom	1922-1938	1924-1937	1924-1938	1924-1937	1924-1938
United States	1919-1938	1922-1938	1922-1938	1922-1938	1922-1938
Yugoslavia	1926-1935	1926-1935	1926-1935	1926-1935	1926-1935

Notes: This figure shows the availability of BoP Data for each country in the sample. Column (1) refers to capital and current account balances. Columns (2) and (3) refer to individual credit and debit entries within the capital and current account respectively. Columns (4) and (5) show the years where it is possible to further distinguish between the individual components of capital and current account.

Table A1.2: *Financial crises in sample*

Country	Baron, Verner, Xiong	Reinhart, Rogoff	Combined Interwar
Argentina	1930, 1934	1931, 1934	1930, 1934
Australia	1931	1931, 1932	1931
Austria	1929, 1931, 2008, 2011	1929, 1931	1929, 1931
Belgium	1931, 1939, 2008, 2011	1931, 1934, 1939	1931, 1939
Bulgaria			-
Canada	-	-	-
China		1931, 1934, 1937	1931, 1934, 1937
Czech	1931, 1995		1931
Denmark	1931, 2008, 2011	1931	1931
Estonia			1930, 1931
Finland	1931	1931, 1939	1931
France	1930, 1937, 2008	1930, 1931, 1932	1930, 1937
Germany	1929, 1930, 2008	1929, 1930, 1931, 1932	1929, 1930
Greece	1931	1931, 1932	1931
Hungary	1931, 2008	1931, 1932	1931
Iceland	2008		-
India	1929, 1993	1929, 1930, 1931	1929
Indonesia	2007		-
Ireland	2007, 2010		-
Italy	2008, 2011, 2016		N.A.
Japan	1927, 2001	1927	1927
Korea	1997		N.A.
Latvia			-
Lithuania			-
Luxembourg	-		N.A.
Netherlands	1931, 2008		1931
New Zealand	-	-	-
Norway	1927, 1931, 1936, 2008	1927, 1936	1927, 1931, 1936
Poland		1931, 1932, 1934	1931, 1932, 1934
Portugal	2008, 2011, 2014		N.A.
Romania		1931	1931
Russia	1998, 2008		N.A.
South Africa	-		-
Spain	2008, 2010		N.A.
Sweden	1931, 1991, 2008	1931, 1932	1931
Switzerland	1990, 2008		N.A.
Turkey	1930, 1931, 1991, 1994, 2001	1931	1930, 1931
United Kingdom	1973, 1991, 2008	-	-
United States	1929, 1930, 1984, 1990, 2007	1929, 1930, 1931, 1932, 1933	1929, 1930
Yugoslavia			1931, 1932

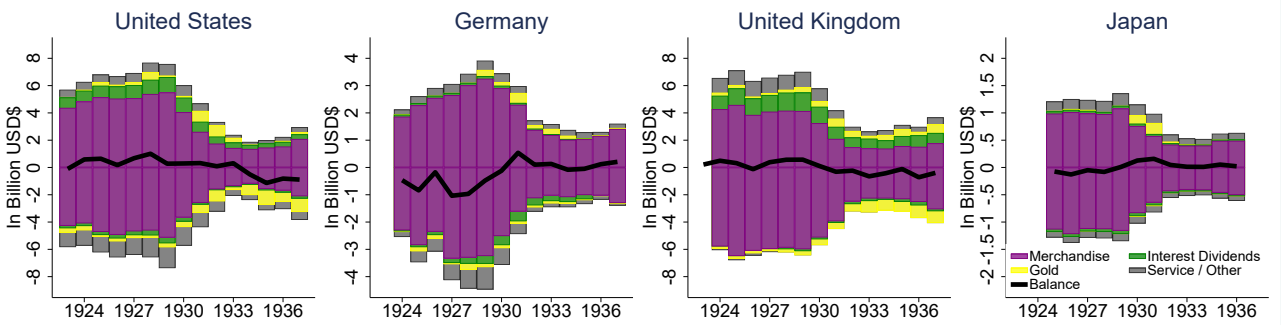
Notes: This table shows the crisis dating from the chronologies of Baron et al. (2021) and Reinhart and Rogoff (2009). Crises are defined as banking crises in Reinhart and Rogoff (2009), but, due to a more detailed breakdown, as either banking crises, banking panics, or narrative crises in Baron et al. (2021). BVX crisis also include dates outside the interwar period, as it is the chronology employed in the chapter on external validity. Despite Canada experiencing large losses in bank equity, no banking failures followed, consequently excluding Canada from conventional crisis-dating (Bordo et al., 2001; Baron et al., 2021; Reinhart and Rogoff, 2009). The third column joins the two crisis chronologies for a more comprehensive country coverage and additionally adds crisis dates from Grossman (1994). A blank space refers to the respective country not being covered by the chronology, a "-" indicates that the country is covered but experienced no crisis, and N.A. refers to countries that are included only in the later OECD data and consequently are not applicable for the combined interwar sample.

Table A1.3: *Summary statistics of main interwar variables*

	Mean	Median	Std. Dev.	Min	Max	Obs	Panels
GDP 1 Year log Growth	0.028	0.028	0.054	-0.185	0.315	681	35
GDP 2 Year log Growth	0.055	0.055	0.084	-0.242	0.440	646	35
GDP 3 Year log Growth	0.082	0.084	0.105	-0.329	0.472	611	35
GDP 4 Year log Growth	0.106	0.109	0.123	-0.364	0.567	576	35
GDP 5 Year log Growth	0.128	0.130	0.137	-0.351	0.690	541	35
GDP 6 Year log Growth	0.147	0.147	0.148	-0.305	0.671	506	35
Capital, Balance	-0.001	0.001	0.207	-2.036	1.036	501	37
Capital, Debit	0.167	0.031	0.404	0.000	3.656	474	37
Capital, Credit	0.174	0.046	0.384	0.000	2.602	474	37
Capital, Balance t to t-2	0.002	0.001	0.512	-3.829	2.483	427	37
Capital, Debit t to t-2	0.532	0.109	1.227	0.000	9.477	400	37
Capital, Credit t to t-2	0.551	0.150	1.152	0.000	7.439	400	37
Combined Interwar Crisis	0.077	0.000	0.266	0.000	1.000	770	37
Gross Exposure Dummy (GED)	0.156	0.000	0.363	0.000	1.000	770	37
Gross Foreign Assets Dummy (GFA)	0.162	0.000	0.369	0.000	1.000	770	37
Crisis × *GED*	0.016	0.000	0.124	0.000	1.000	770	37
Crisis × *GFA*	0.022	0.000	0.147	0.000	1.000	770	37
Gold Standard	0.177	0.000	0.382	0.000	1.000	1155	56
Capital Account Openness	67.229	50.000	27.712	12.500	100.000	378	22
Δ Domestic Credit	-0.031	0.005	0.680	-7.210	2.895	381	29

Notes: This table shows summary statistics of the main variables for the interwar sample. Output growth variables are compiled from various sources and jointly expressed in cumulative log differences over the indicated period. Variables from the Balance of Payments are expressed in billion USD. Crises and Gold Standard variables are included as dummy variables, with their mean expressing the unconditional sample frequency of crises. GED and GFA refer to the constructed dummy variables, capturing the accumulation of foreign credit or foreign assets. Their interaction refers to the the respective subset of crisis. The capital account openness measure is based on Quinn (2003) and reports the unconditional capital account openness. During the Gold Standard, the average openness score is 93 versus only 49 outside of it. Reported statistics are the variable mean, median, standard deviation, minimum, maximum, the total number of observations and the number of panels (countries) for which the variable is available.

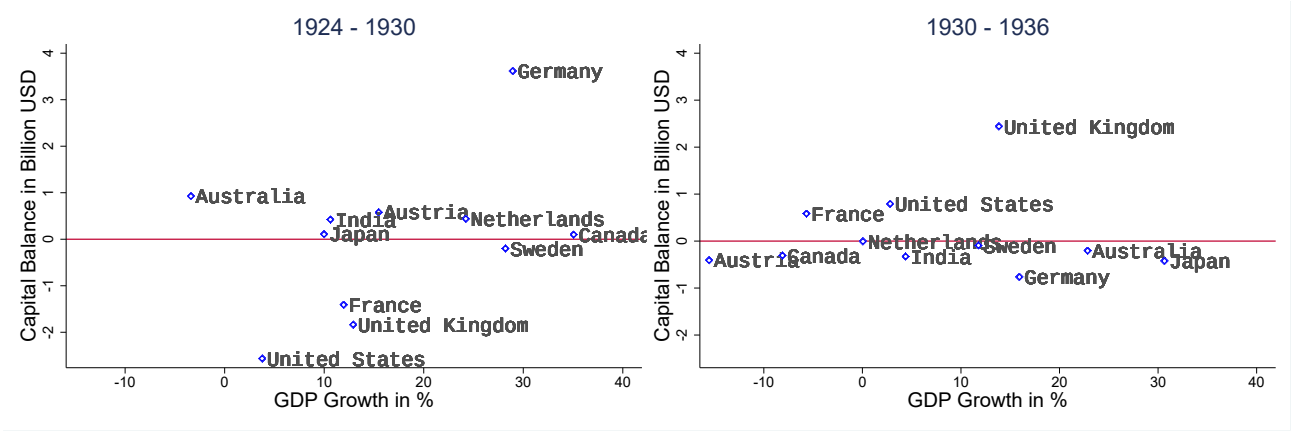
Figure A1.2: *Current account composition*



Notes: This figure shows the annual gross financial flows from the current account side of the balance of payments for the United States, Germany, the United Kingdom and Japan. Figures are in billion US dollars. Purple, green, yellow and gray represent flows in goods, secondary incomes (interest and dividends), gold and services respectively. Black is the current account balance.

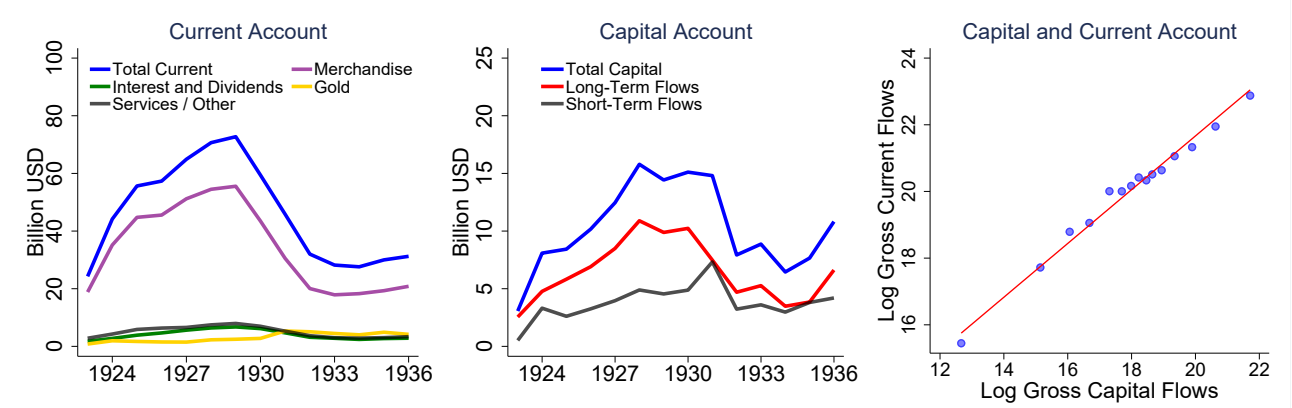
A2. Trends

Figure A2.3: *Net creditors and net borrowers before and after the Great Depression*



Notes: This figure plots the cumulative capital account balance against cumulative GDP growth, covering the periods 1924 to 1930 and 1930 to1936 for the major economies. The two panels show that the two groups of countries swap places, with capital exporters becoming importers and vice versa. A relation between net capital exports and GDP growth is not discernible.

Figure A2.4: *Trends in gross balance of payments flows*



Notes: This figure shows in the left panel the total gross flows (Credit + Debit) for the individual parts of the current account in billion USD. Flows in trade (purple) make up by far the largest part, with secondary incomes (green), services (gray) and gold (gold) making up the remainder. The middle panel shows this decomposition for the capital account. While long-term capital flows (red) generally make up the largest share, short-term flows (gray) make up a sizable portion and gain in importance around the Great Depression. The right panel plots the log gross totals of current and capital account against one another using 15 equal sized bins, confirming the visual impression of a high co-linearity between the two.

A3. Capital flows and business cycle dynamics

Table A3.4: *Capital flows and business cycle dynamics, 5 year cumulative capital flows*

	$\Delta_2 Y_{i,t+2}$			$\Delta_3 Y_{i,t+3}$			$\Delta_4 Y_{i,t+4}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{4} Balance_{i,t-j}$	-0.02***	0.00		-0.03***	-0.00		-0.03***	-0.01	
	(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)	
$\Sigma_{j=0}^{4} Credit_{i,t-j}$		-0.04***	-0.04***		-0.05***	-0.05***		-0.03**	-0.04***
		(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)
$\Sigma_{j=0}^{4} Debit_{i,t-j}$			0.00			0.00			0.00
			(0.01)			(0.01)			(0.01)
R^2	0.208	0.282	0.282	0.369	0.433	0.433	0.616	0.636	0.635
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
p-value, $\beta_{Credit} = \beta_{Balance}$		0.02			0.04			0.21	
p-value, $\beta_{Credit} = \beta_{Debit}$			0.00			0.00			0.01
Observations	291	291	291	263	263	263	234	234	234

Notes: This table regresses log GDP growth over varying time horizons on cumulative capital account flows summed from t to $t-4$. All specifications control for country fixed effects. Adjusting for longer time spans, lagged growth indicates three, four and five year distributed lags of GDP growth, depending on the length of the forecast horizon. The reported p-value refers to a test for the equality of coefficients. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A3.5: *Capital flows and business cycle dynamics, by source of GDP data*

	$\Delta_2 Maddison_{i,t+2}$			$\Delta_2 EAI_{i,t+2}$			$\Delta_2 Y_{i,t+2}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	-0.02***	0.01		-0.03***	-0.00		-0.02***	0.01	
	(0.01)	(0.01)		(0.01)	(0.01)		(0.01)	(0.01)	
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		-0.04***	-0.04***		-0.05**	-0.05***		-0.04***	-0.04***
		(0.01)	(0.01)		(0.02)	(0.02)		(0.01)	(0.01)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			-0.00			0.00			0.00
			(0.01)			(0.01)			(0.01)
R^2	0.126	0.246	0.242	0.318	0.421	0.423	0.123	0.232	0.229
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
p-value, $\beta_{Credit} = \beta_{Balance}$		0.00			0.08			0.01	
p-value, $\beta_{Credit} = \beta_{Debit}$			0.00			0.00			0.00
Observations	327	327	327	162	162	162	363	363	363

Notes: This table presents estimation results from Equation 5 for different sources of GDP growth separately. The two largest contributes to the total sample are Maddison style GDP estimates from Bolt and van Zanden (2020) and economic activity indicators from Albers (2018). The combined sample also includes growth rates from Baron et al. (2021) and estimates for the Baltic states from Klimantas and Zirgulis (2020); Norkus and Markevičiūtė (2021). The dependent variable is log GDP growth from t to $t+2$. The independent variables are cumulative capital account flows in years $t-2$ to t. All specifications control for country fixed effects and lagged growth indicates a two year distributed lag of GDP growth. The reported p-value refers to a test for the equality of coefficients. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A3.6: *Capital flows and equity returns*

	$\Delta_2 FI - Equity_{i,t+2}$			$\Delta_2 NF - Equity_{i,t+2}$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	-0.01	0.05*		-0.07**	0.02	
	(0.02)	(0.03)		(0.03)	(0.03)	
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		-0.10**	-0.06**		-0.14**	-0.13***
		(0.04)	(0.03)		(0.06)	(0.05)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			-0.03			0.00
			(0.03)			(0.03)
R^2	0.053	0.113	0.110	0.218	0.285	0.284
Country fixed effects	✓	✓	✓	✓	✓	✓
Lagged Returns	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓
p-value, $\beta_{Credit} = \beta_{Balance}$		0.02			0.09	
p-value, $\beta_{Credit} = \beta_{Debit}$			0.41			0.00
Observations	219	219	219	228	228	228

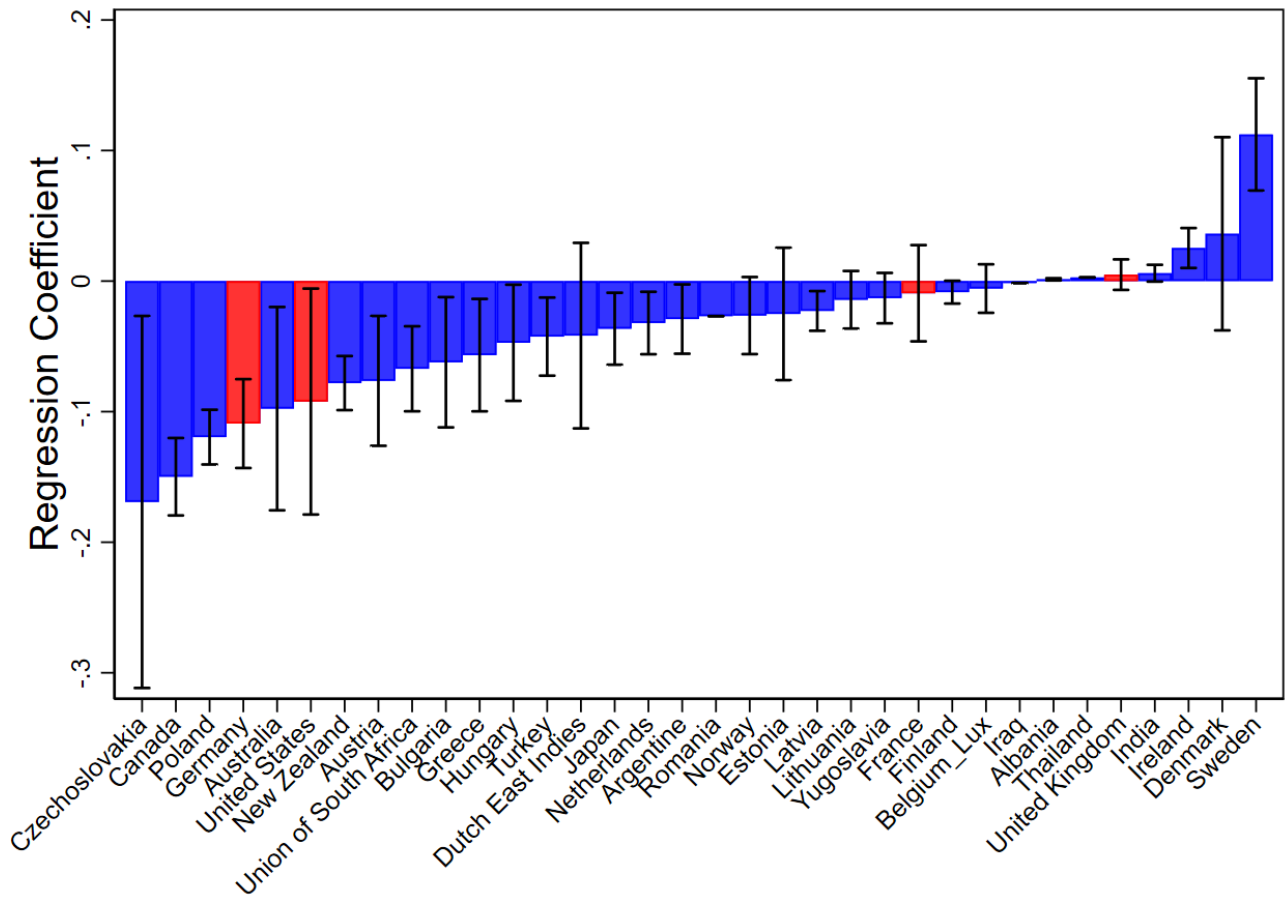
Notes: This table presents estimation results for cumulative equity returns for financial and non-financial corporations between t and $t+2$, using the data from Baron et al. (2021). FI and NF refer to the equity returns of financial and non financial institutions respectively. The independent variables are cumulative capital flows from $t-2$ to t. The reported p-value refers to an equality test of the reported coefficients. All specifications control for country fixed effects and two distributed lags of GDP growth and the respective asset returns. *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A3.7: *Capital flows and business cycle dynamics, sample splits, state dependence and linearity*

	$\Delta_2 Y_{i,t+2}$						
	Time Split		Country Split		State Dependence		Linearity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.05***	-0.05***	-0.07***	-0.03***	-0.04***	-0.03***	
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	0.00	0.01	0.03*	-0.00	0.01	0.00	0.01
	(0.01)	(0.01)	(0.02)	(0.00)	(0.01)	(0.01)	(0.01)
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times 1(>0)$							-0.04*
							(0.02)
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times 1(<0)$							-0.04***
							(0.01)
R^2	0.241	0.299	0.438	0.188	0.170	0.160	0.233
Country fixed effects	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓
Sample	pre 1929	post 1929					
Countries			Core	Non-Core			
Current Account					Positive	Negative	
Lagged Balances							
Observations	124	238	73	290	173	187	363

Notes: This table presents estimation results from Equation 5, including control variables, sample splits and checks for state dependencies. The dependent variable is log GDP growth from t to $t+2$. The independent variables are cumulative capital account flows in years $t-2$ to t. Core countries are defined as the largest economies in North America and Europe: the United States, the United Kingdom, France, Germany, Canada and the Netherlands. All specifications control for country fixed effects and lagged growth indicates a two year distributed lag of GDP growth. The reported p-value refers to a test for the equality of coefficients. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

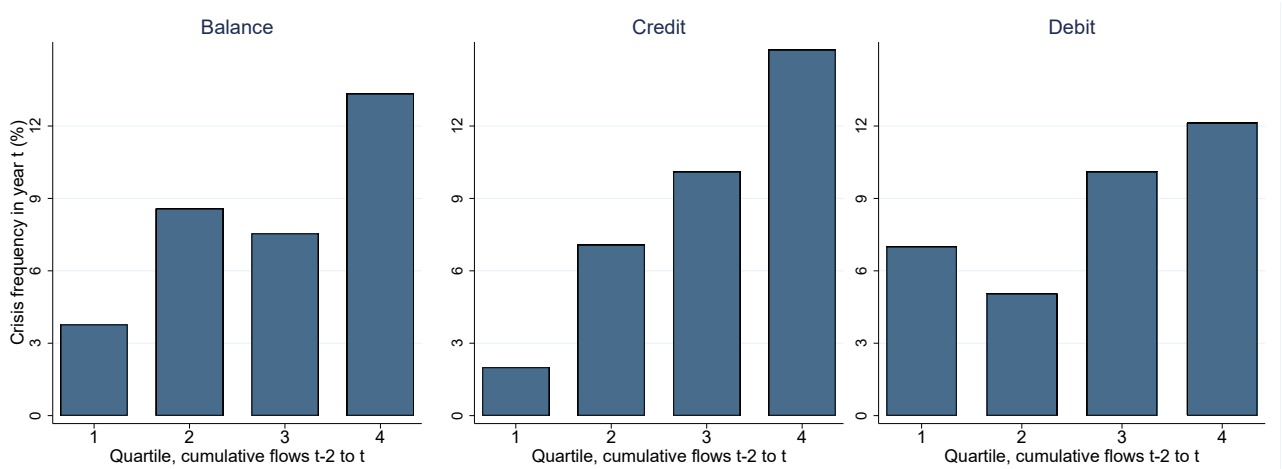
Figure A3.5: *Capital flows and business cycle dynamics, country level regression coefficients*



Notes: This figure plots regression coefficients and 90% confidence intervals, using Newey-West standard errors with a lag length of four, from individual time series regressions of log GDP growth from t to $t+2$ on accumulated credit and debit positions from $t-2$ to t. The shown coefficients are β^C, for capital account credit, with the specification $\Delta_2 y_{i,t+2} = \alpha_i + \beta^C \Sigma_{j=0}^{2} Credit_{i,t-j} + \beta^D \Sigma_{j=0}^{2} Debit_{i,t-j} + u_{i,t+2}$ estimated on individual country sub-samples.

A4. Capital flows and financial fragility

Figure A4.6: *Capital flows and financial crises, conditional probability*



Notes: This figure shows the relationship between cumulative capital flows between $t-2$ and t and financial crisis frequencies for the year t. Observations are sorted into four equal-sized quartiles according to the volume of cumulative capital flows between $t-2$ and t. Vertical bars indicate the frequency of financial crises in year t for each of these bins. The conditional frequency of financial crises can be seen to peak in the highest quartile of gross foreign credit.

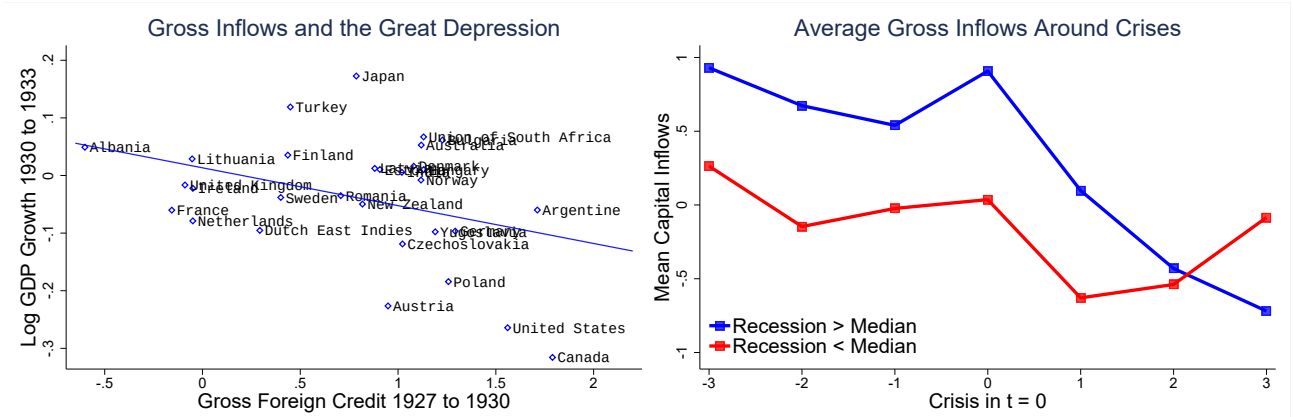
Table A4.8: *Capital flows predicting financial crises, Reinhart and Rogoff crisis dating*

	$RR\,Crisis_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	0.01	-0.04*			0.04	-0.02		
	(0.02)	(0.02)			(0.03)	(0.04)		
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		0.08***	0.04**	0.05**		0.09***	0.07**	0.08***
		(0.02)	(0.02)	(0.02)		(0.03)	(0.03)	(0.03)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			0.04**				0.03	
			(0.02)				(0.02)	
AUC	0.74	0.77	0.77	0.77	0.76	0.79	0.79	0.79
s.e.	0.04	0.05	0.05	0.04	0.05	0.05	0.05	0.04
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Country fixed effects					✓	✓	✓	✓
Observations	301	301	301	301	192	192	192	192

Notes: The table shows estimation results of a probit model for Reinhart and Rogoff (2009) financial crises, reporting mean marginal effects. The independent variables are cumulative flows recorded in the capital account of the BoP in year -2 to t. AUC is the area under the ROC-Curve, below it is its standard error. Standard errors in parentheses are clustered on country level and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

A5. Recession severity: aggravation and moderation

Figure A5.7: *Capital inflows and recession severity*



Notes: This figure relates gross capital inflows to recession severity. The left panel scatters normalized gross capital inflows between 1927 and 1930 against log GDP growth between 1930 and 1933, producing a visibly negative relationship. To account for heterogeneous crisis starting dates, the right panel splits the sample along the median recession severity in the first 3 years after a crisis, using the combined interwar crises chronology. It plots the average gross capital inflows in the 6-year window around crises for both groups, showing that before a crisis, gross inflows are consistently higher in countries with larger than median recessions, but lower three years afterwards.

Table A5.9: *GDP growth, crises and exposure to gross capital inflows, alternative GED2 measure*

	$\Delta_2 Y_{i,t+2}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_{i,t}$	-0.05**	-0.00	0.03	0.02	-0.05**	-0.01	0.02	0.02
	(0.02)	(0.02)	(0.04)	(0.04)	(0.02)	(0.02)	(0.04)	(0.04)
$GED2_{i,t}$	-0.04**	-0.03**	-0.00	-0.01	-0.04**	-0.04**	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
$Crisis_{i,t} \times GED2_{i,t}$		-0.06**	-0.07**	-0.07*		-0.05**	-0.06*	-0.06*
		(0.02)	(0.04)	(0.04)		(0.02)	(0.04)	(0.04)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$			-0.04***	-0.03**			-0.04***	-0.04***
			(0.01)	(0.01)			(0.01)	(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$			0.00	0.00			0.00	0.00
			(0.01)	(0.01)			(0.01)	(0.01)
$Gold\ Standard_{i,t}$				-0.03*				-0.02
				(0.02)				(0.02)
R^2	0.122	0.126	0.254	0.276	0.164	0.168	0.317	0.321
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Crisis in Sample					✓	✓	✓	✓
Observations	342	342	342	342	241	241	241	241

Notes: This table re-estimates Equation 9, with an alternative definition for foreign capital exposure prior to crisis. The alternative $GED2$-dummy is defined as the first lag of the baseline credit variable $\Sigma_{j=0}^{2} Credit_{i,t-j}$ being in the top 80%. The dependent variable is log GDP growth over the period t to $t+2$. The independent variables are financial crises in year t, the $GED2$-variable capturing exposure to capital inflows, the baseline BoP-variables accumulated over t to $t-2$ and a Gold Standard indicator. All specifications additionally control for country fixed effects and a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A5.10: *GDP growth, crises and exposure to gross capital inflows, Reinhart and Rogoff crisis dating*

	$\Delta_2 Y_{i,t+2}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Crisis_{i,t}$	-0.03*	-0.00	0.02*	0.02*	-0.04*	-0.00	0.02	0.02*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
$GED_{i,t}$	0.00	0.01	0.04**	0.04**	-0.00	0.02	0.04*	0.04*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$Crisis_{i,t} \times GED_{i,t}$		-0.12*	-0.11*	-0.11*		-0.12*	-0.11*	-0.11*
		(0.07)	(0.06)	(0.06)		(0.07)	(0.06)	(0.06)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$			-0.04***	-0.04***			-0.04***	-0.04***
			(0.01)	(0.01)			(0.01)	(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$			0.01	0.01			0.01	0.01
			(0.01)	(0.01)			(0.01)	(0.01)
$Gold\ Standard_{i,t}$				-0.04**				-0.03*
				(0.02)				(0.02)
R^2	0.078	0.119	0.273	0.307	0.089	0.145	0.301	0.320
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Crisis in Sample					✓	✓	✓	✓
Observations	252	252	252	252	188	188	188	188

Notes: This table presents estimation results from Equation 9. The dependent variable is log GDP growth over the period t to $t+2$. The independent variables are financial crises in year t (using only Reinhart and Rogoff (2009) crisis dating), the GED-variable capturing exposure to large capital inflows, the baseline BoP-variables accumulated over t to $t-2$ and a gold standard dummy variable. All specifications additionally control for country fixed effects and a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

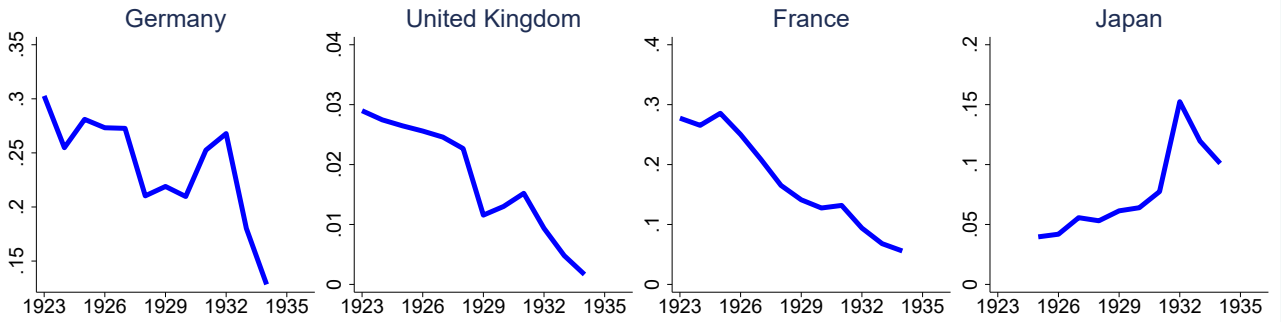
A6. Instrumental Variable Results

Table A6.11: *'Pass through' coefficients of United States portfolio investments*

	Total BBS		*Loans*	*Securities*	*Cash*	*Other*
	(1)	(2)	(3)	(4)	(5)	(6)
$Credit_{i,t}$	0.30**					
	(0.13)					
$\Delta USP_{i,t}$		0.97***	0.45**	0.35**	0.11*	0.05*
		(0.34)	(0.18)	(0.16)	(0.06)	(0.02)
Country fixed effects	✓	✓	✓	✓	✓	✓
Observations	363	325	325	325	325	325

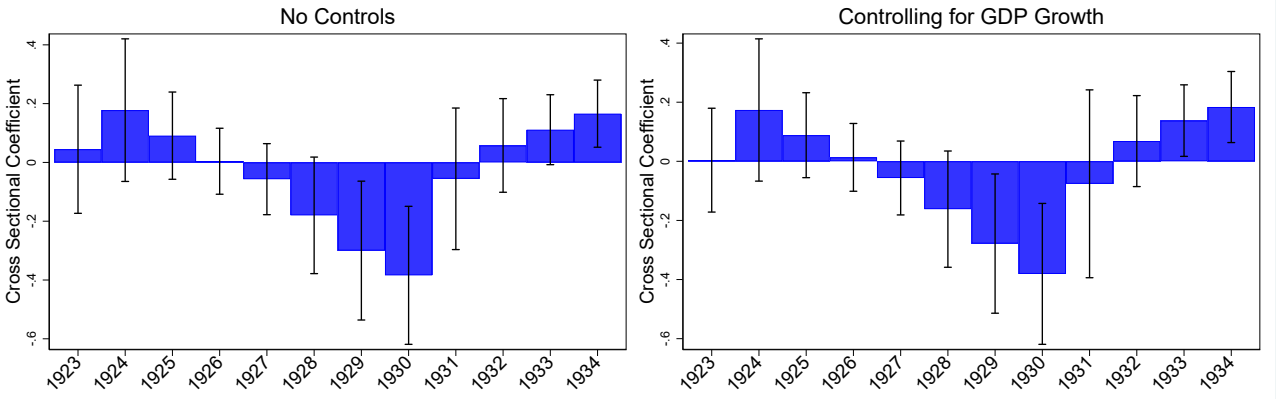
Notes: This table displays 'pass through' coefficients from gross foreign credit and changes in US portfolio investments (USP) to changes in domestic bank balance sheets (BBS). Bank balance sheet changes are further decomposed into the changes in loans, securities, cash and other assets held by domestic banks. Changes are computed based on Eren et al. (2023) with the dependent variable being defined as the change in Bank Balance sheets size (or its separate components), scaled by total balance sheets size in $t-1$ $\frac{BBS_{i,t}-BBS_{i,t-1}}{TotalBBSi,t-1}$. This is regressed on the change in the US portfolio position (or a yearly BoP flow), similarly scaled by total bank balance sheets size in $t-1$ $\frac{USP_{i,t}-USP_{i,t-1}}{TotalBBSi,t-1}$. All specifications include country fixed effects. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Figure A6.8: *US portfolio investment relative to domestic bank balance sheet size*



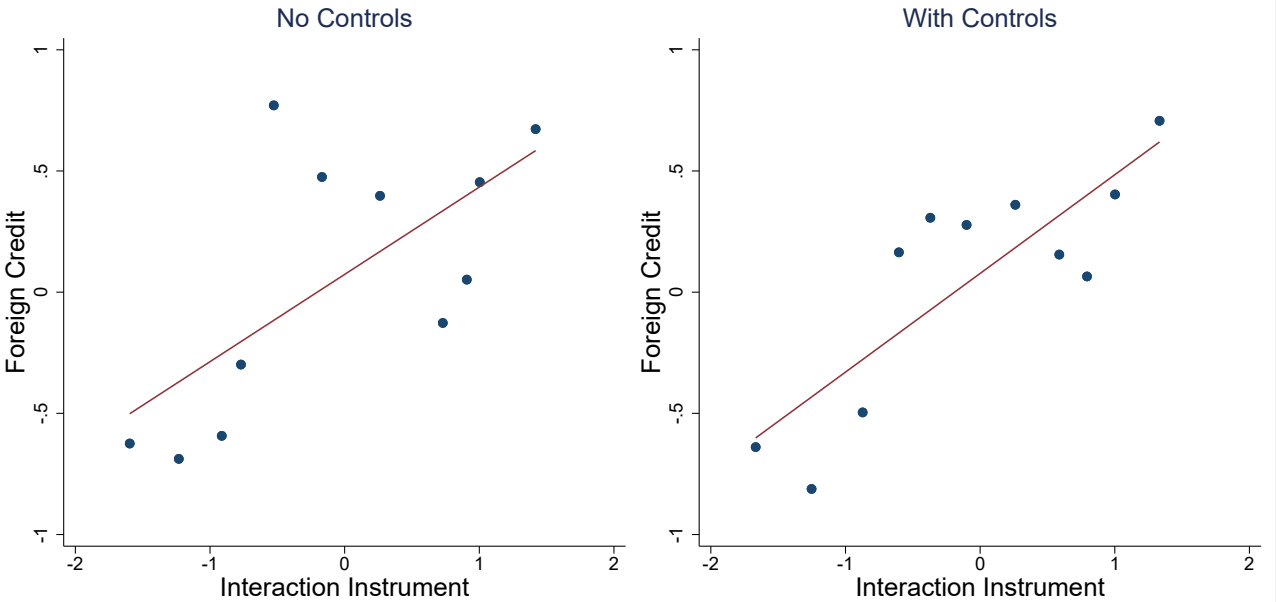
Notes: This figure plots the ratio of the United States portfolio position relative to domestic bank balance sheet size for Germany the United Kingdom, Japan and France over time. Since this ratio is dependent on two time variant variables, changes either in of them might be driving the observed volume and trends. For Example: US portfolio investment volumes in Germany are consistently about 3 to 4 times as large as in the United Kingdom. The balance sheets of commercial banks in the UK, on the other hand, are three to four times as large as the balance sheets of their German counterparts. This results in the ratio of US portfolio investments to domestic bank balance sheets being about 10 times larger in Germany when compared to the United Kingdom.

Figure A6.9: *Capital exposure to the United States, 3 year cross-sectional GDP growth*



Notes: This figure shows coefficients for a cross-sectional regression of three year future GDP growth $\Delta_3 Y_{i,t+3}$ on lagged exposure to US-portfolio investments $\frac{USP_{i,t-1}}{BBS_{i,t-1}}$, for every year between 1923 and 1934. The left panel shows the unconditional relationship, the right panel includes contemporary GDP growth. Black lines represent 90% confidence intervals. The figure shows that a close financial relationship with the United States was positively associated with growth in the early 1920sh, but also that this link turned negative with the onset of the Great Depression, before turning positive again afterwards.

Figure A6.10: *First stage plots of Bartik-style instrument*



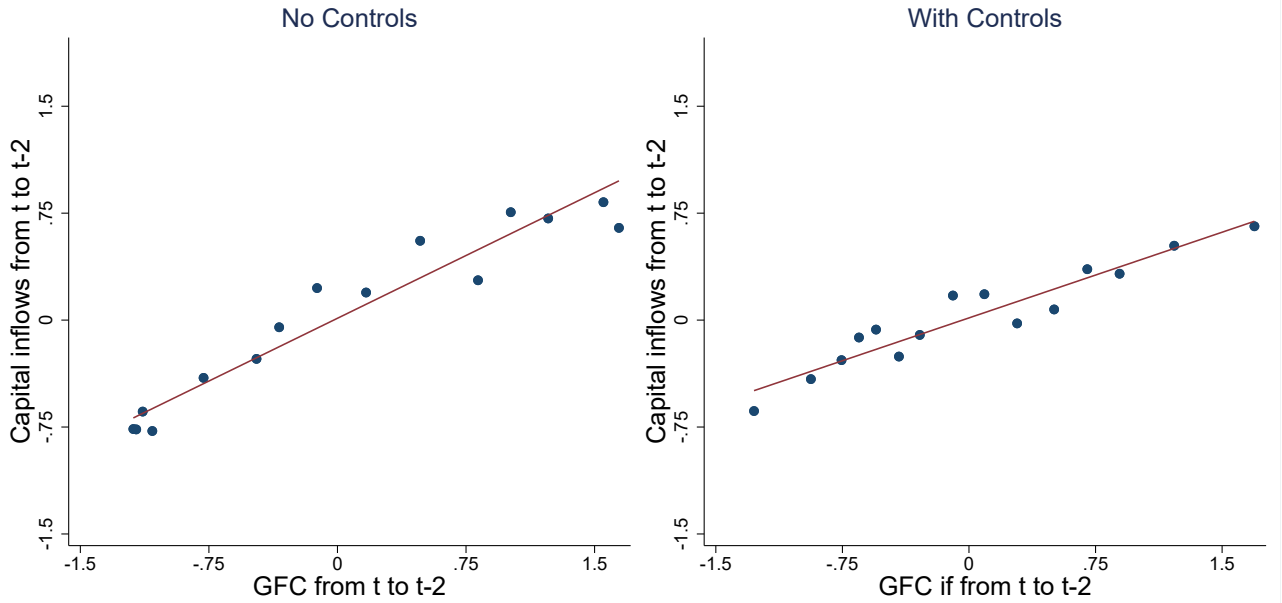
Notes: This figure shows the first stage relationship between the Bartik-style instrument, constructed in Equation 10, and the gross yearly inflows at time t. Both variables are normalized and collapsed into equal sized bins. Each point represents the group specific mean.The right panel includes country fixed effects and additionally controls for net capital inflows between $t-2$ and t and GDP growth. Fitted regression lines illustrate the positive correlation.

Table A6.12: *Gross foreign inflows and GDP dynamics, Bartik-style instrument robustness*

	$\Delta_2 Y_{i,t+2}$			$\Delta_3 Y_{i,t+3}$			$\Delta_4 Y_{i,t+4}$		
	OLS (1)	*Reduced* (2)	*IV* (3)	*OLS* (4)	*Reduced* (5)	*IV* (6)	*OLS* (7)	*Reduced* (8)	*IV* (9)
$Credit_{i,t}$	-0.02***		-0.04*	-0.04***		-0.08***	-0.04***		-0.12***
	(0.01)		(0.02)	(0.01)		(0.03)	(0.01)		(0.03)
Interaction IV		-0.02*			-0.04***			-0.05***	
		(0.01)			(0.01)			(0.02)	
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap Weak ID			20.73			20.70			15.89
Observations	254	254	254	254	254	254	245	245	245

Notes: This table presents OLS, reduced form and instrumented coefficients for a regression of log GDP growth between t and $t+h$ on gross foreign inflows at time t. The instrument deviates from the one described in Equation 10, as the exposure share to US-portfolio investments is adjusted to be the mean of the previous two years, instead of being fixed to 1927. For the benefits and caveats associated with this change, see text. The instrument is used to instrument gross inflows in columns (3), (6) and (9). Reduced form and instrumented coefficients are larger than OLS-coefficients, suggesting a baseline bias towards zero. All specifications control for country fixed effects, a two year distributed lag of GDP growth and net capital flows. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Figure A6.11: *First stage plots of GFC-measure and capital inflows*



Notes: This figure shows the first stage relationship between the GFC-measure and the baseline gross yearly inflow variable. Both variables are normalized three year sums and collapsed into 15 equal sized bins. Each point represents the group specific mean. The right panel includes country fixed effects and additionally controls for net capital inflows between $t-2$ and t and GDP growth. Fitted regression lines illustrate the positive correlation.

Table A6.13: *Gross foreign inflows and GDP dynamics, global financial cycle instrument*

	$\Delta_2 Y_{i,t+2}$			$\Delta_3 Y_{i,t+3}$			$\Delta_4 Y_{i,t+4}$		
	OLS (1)	*Reduced* (2)	*IV* (3)	*OLS* (4)	*Reduced* (5)	*IV* (6)	*OLS* (7)	*Reduced* (8)	*IV* (9)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.04***		-0.13***	-0.06***		-0.17***	-0.06***		-0.17***
	(0.01)		(0.03)	(0.02)		(0.04)	(0.02)		(0.04)
$\Sigma_{j=0}^{2} GFC_{-i,t-j}$		-0.05***			-0.07***			-0.07***	
		(0.01)			(0.01)			(0.01)	
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Net Capital Inflows	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap Weak ID			25.40			24.59			24.37
Observations	321	321	321	294	294	294	266	266	266

Notes: This table presents OLS, reduced form and instrumented coefficients for a regression of log GDP growth between t and $t+h$ on BoP variables, summed over the period from $t-2$ to t. In columns (3), (6) and (9) gross foreign inflows are instrumented with the global financial cycle. Reduced form and instrumented coefficients are larger than OLS-coefficients, suggesting a baseline bias towards zero. All specifications control for country fixed effects, a two year distributed lag of GDP growth and net capital flows. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

A7. Channels

Table A7.14: *Capital flows, GDP growth and the Gold Standard*

	$\Delta_2 Y_{i,t+2}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.04***	-0.04**	-0.03**	-0.06***	-0.03**	-0.05***		-0.04***	-0.03**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)		(0.01)	(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	0.01	0.01	0.01	0.02**	0.00	0.02*		0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)
$\Sigma_{j=0}^{2} Gold\ Balance_{i,t-j}$	0.01	0.00	0.01	0.01	0.01	-0.01	-0.01	0.01	0.01
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
$Gold\ Standard_{i,t}$								-0.03	-0.03
								(0.02)	(0.02)
R^2	0.243	0.188	0.200	0.296	0.172	0.197	0.034	0.263	0.288
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample		pre 1933	post 1933			pre 1933	pre 1933		
Goldstandard				Yes	No	Yes	Yes		
Lagged GoldStandard									✓
Observations	329	192	134	146	181	125	125	329	329

Notes: This table links capital and gold flows to GDP growth and Gold Standard theory (see text). The dependent variable is log GDP growth from t to $t+2$. The independent variables are cumulative capital account flows in years $t-2$ to t, net gold flows from $t-2$ to t and a Gold Standard dummy variable. The Gold Standard mechanism, of the outflow of physical gold being related to adverse outcomes, is visible in column (7). All specifications control for country fixed effects and lagged growth indicates a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

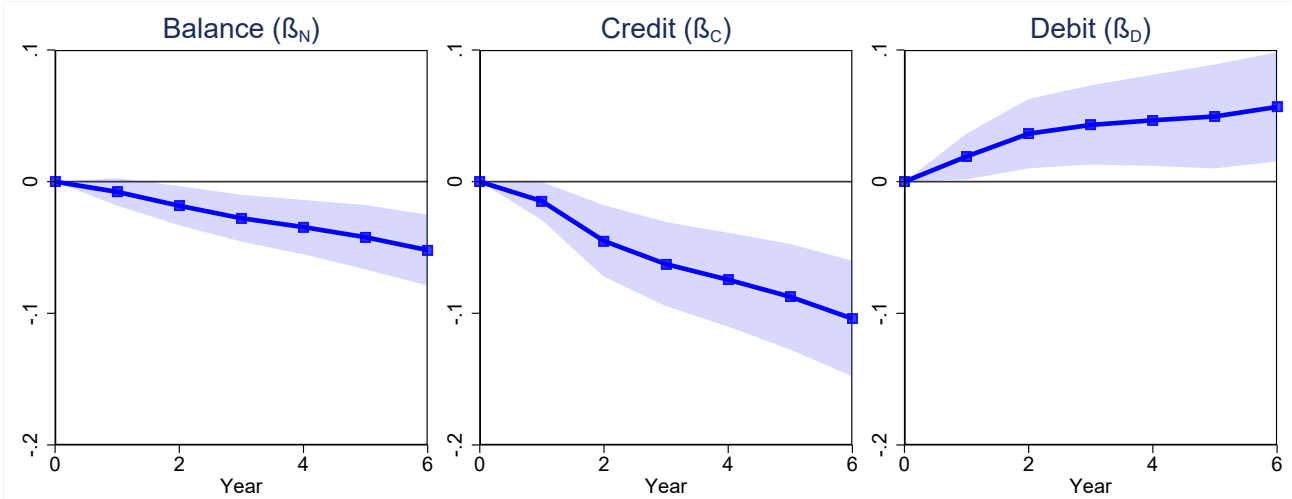
Table A7.15: *Capital flows, the Gold Standard and capital account openness, full interaction set*

	$\Delta_2 Y_{i,t+2}$								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$	-0.04***	-0.05***	-0.05***	-0.06***	-0.07***	-0.06***	-0.06***	-0.06***	-0.06***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$No\ Gold_{i,t\to t-2}$	0.04***	0.04***	0.04***						
	(0.02)	(0.02)	(0.02)						
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times No\ Gold_{i,t\to t-2}$	0.03*	0.04*	0.03**						
	(0.02)	(0.02)	(0.02)						
$\Sigma_{j=0}^{2} Balance_{i,t-j}$		0.00			0.01			0.00	
		(0.01)			(0.01)			(0.01)	
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			0.01			-0.01			-0.00
			(0.01)			(0.01)			(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j} \times No\ Gold_{i,t\to t-2}$		-0.01							
		(0.01)							
$\Sigma_{j=0}^{2} Debit_{i,t-j} \times No\ Gold_{i,t\to t-2}$			-0.00						
			(0.01)						
$Closed\ (<100)_{i,t\to t-2}$				0.05***	0.05***	0.05***			
				(0.02)	(0.02)	(0.02)			
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times Closed\ (<100)_{i,t\to t-2}$				0.04**	0.05***	0.03*			
				(0.02)	(0.02)	(0.02)			
$\Sigma_{j=0}^{2} Balance_{i,t-j} \times Closed\ (<100)_{i,t\to t-2}$					-0.01***				
					(0.00)				
$\Sigma_{j=0}^{2} Debit_{i,t-j} \times Closed\ (<100)_{i,t\to t-2}$						0.02***			
						(0.01)			
$Closed\ (<67)_{i,t\to t-2}$							0.04***	0.04***	0.04***
							(0.02)	(0.02)	(0.02)
$\Sigma_{j=0}^{2} Credit_{i,t-j} \times Closed\ (<67)_{i,t\to t-2}$							0.05**	0.05**	0.04**
							(0.02)	(0.02)	(0.02)
$\Sigma_{j=0}^{2} Balance_{i,t-j} \times Closed\ (<67)_{i,t\to t-2}$								-0.01	
								(0.01)	
$\Sigma_{j=0}^{2} Debit_{i,t-j} \times Closed\ (<67)_{i,t\to t-2}$									0.01
									(0.01)
R^2	0.274	0.275	0.277	0.409	0.412	0.414	0.383	0.384	0.385
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	342	342	342	234	234	234	234	234	234

Notes: This table presents estimation results from interacting capital inflows with measures for Gold Standard adherence and capital account openness. It shows the full set of interactions for all variables included in Table 7. The dependent variable is log GDP growth from t to $t+2$. Columns (1) to (3) interact BoP-flows with a dummy for not being on gold between t and $t-2$. Columns (4) to (6) perform a similar interaction with a dummy for the capital account being less than 100 percent open, based on the Quinn (2003) capital account openness measure. Columns (7) to (9) repeat the specification for capital account openness being in the lower two thirds. All specifications control for country fixed effects and lagged growth refers to a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

A7-1 Findings in modern data

Figure A7.12: *Balance of Payments flows and business cycle dynamics, OECD data*



Notes: This figure shows local projection results of log GDP growth over horizons $h = 1, ..., 6$ for the OECD-sample. The left panel plots the response of GDP growth to changes in the capital account balance. The middle and right panel do the same for credit and debit, respectively. Standard errors in parentheses are dually clustered on country and year. Confidence intervals are plotted at the 95% level.

Table A7.16: *Capital flows and business cycle dynamics, 3-year cumulative capital flows in OECD data*

	$\Delta_2 Y_{i,t+2}$							
	OECD Sample				*Full Sample*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Balance_{i,t}$	-0.02**		-0.01*		-0.02***		-0.00	
	(0.01)		(0.00)		(0.00)		(0.00)	
$Credit_{i,t}$		-0.03***	-0.03***	-0.04***		-0.03***	-0.03***	-0.03***
		(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
$Debit_{i,t}$				0.01				0.00
				(0.01)				(0.00)
R^2	0.189	0.290	0.297	0.292	0.179	0.258	0.259	0.258
Country fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Observations	657	657	657	657	1018	1018	1018	1018

Notes: This table re-estimates the baseline specification for the OECD and the combined sample. The dependent variable is log GDP growth over the period from t to $t + 2$. The independent variables are cumulative capital account flows from $t - 2$ to t. All specifications control for country fixed effects and a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A7.17: *Crisis prediction in combined OECD and LoN Data*

	$BVX\,Crisis_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$	0.02***	0.01			0.03***	0.02*		
	(0.01)	(0.01)			(0.01)	(0.01)		
$\Sigma_{j=0}^{2} Credit_{i,t-j}$		0.03***	0.03***	0.03***		0.03***	0.04***	0.04***
		(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
$\Sigma_{j=0}^{2} Debit_{i,t-j}$			0.00				-0.01	
			(0.01)				(0.01)	
AUC	0.67	0.70	0.70	0.70	0.72	0.75	0.74	0.74
s.e.	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04
Lagged Growth	✓	✓	✓	✓	✓	✓	✓	✓
Country fixed effects					✓	✓	✓	✓
Observations	1101	1101	1101	1101	784	784	784	784

Notes: This table shows estimation results of a probit model for financial crises for the combined sample of OECD and League of Nations data. Crisis dates for the post-war period are added from the Baron et al. (2021) database. The reported coefficients are mean marginal effects. The independent variables are cumulative capital flows from year $t-2$ to t. AUC is the area under the ROC-Curve, below it is its standard error. Standard errors in parentheses clustered on country level and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.

Table A7.18: *GDP growth, crises and exposure to gross capital inflows, OECD data*

	$\Delta_2 Y_{i,t+2}$					
	(1)	(2)	(3)	(4)	(5)	(6)
$Crisis_{i,t}$	-0.06***	-0.03**	-0.02	-0.06***	-0.03**	-0.02
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
$GEDi,t$	-0.01*	-0.01	0.02**	-0.01	-0.00	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Crisis_{i,t} \times GED_{i,t}$		-0.05**	-0.04**		-0.06***	-0.05***
		(0.02)	(0.02)		(0.02)	(0.02)
$\Sigma_{j=0}^{2} Credit_{i,t-j}$			-0.03***			-0.02***
			(0.01)			(0.01)
$\Sigma_{j=0}^{2} Balance_{i,t-j}$			-0.00			-0.00
			(0.00)			(0.00)
R^2	0.178	0.183	0.282	0.233	0.243	0.323
Country fixed effects	✓	✓	✓	✓	✓	✓
Lagged Growth	✓	✓	✓	✓	✓	✓
Crisis in Sample				✓	✓	✓
Observations	1018	1018	1018	794	794	794

Notes: This table presents estimation results from Equation 9 for the combined sample of OECD and League of Nations data. The dependent variable is log GDP growth over the period t to $t+2$. The independent variables are financial crises in year t (crisis dates for the post-war period are added from the Baron et al. (2021) database.), the *GED*-variable capturing exposure to large capital inflows (defined as gross inflows being above the yearly median for the two consecutive years $t-1$ and $t-2$) and the baseline BoP-variables accumulated over t to $t-2$. All specifications control for country fixed effects and a two year distributed lag of GDP growth. Standard errors in parentheses are dually clustered on country and year and *,**,*** indicates significance at the 0.1, 0.05, 0.01 levels, respectively.