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Room for Maneuver and Alternatives: A Reinterpretation of the German Crisis of 1931

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This paper revisits the German crisis of 1931, emphasizing that the cause of the crisis was borrowing in a currency that a sovereign cannot control and the resulting high level of foreign currency-denominated debt. We suggest that the deflationist policy of Heinrich Brüning was not due to gold-standard mentality, but because in a sovereign default he was forced to adopt fiscal austerity and not the other, even though such a policy was deemed to be self-defeating amid the crisis. Moreover, the much stated trade-off between the maintenance of the gold standard and the Reichsbank's role as lender of last resort or that the banking crisis could have been voided if the Reichsbank was not committed to the maintenance of the gold standard is nothing but an illusion.

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1 Introduction

The German crisis of 1931 marked the second phase of the Great Depression (Temin, 1989). It gave rise to a run on the sterling and then the dollar, causing financial troubles that turned a relatively bad recession into the Great Depression (Temin, 2008). The expectation that the Bank of England was coming to support the troubled merchant banks, whose liquidity was endangered by the German crisis, led to investors' speculative attacks on the sterling and caused the collapse of the sterling (Accominotti, 2012). Straumann et al. (2016) suggest that the German crisis of 1931 was an equally important event like Britain's suspension of the gold standard which led to the fall of the Swedish krona on September 27, 1931.

Observers such as Peter Temin and Isabel Schnabel agree that the German crisis was a twin crisis in the sense that there was both a currency crisis and a banking crisis. Even though the twin aspect of the crisis is well recognized, the exact cause of the crisis is still in dispute. Temin (2008) argues that the German crisis of 1931 originated in the currency market and not with the banks. It is generally agreed that there was a German currency crisis in June and July of 1931. The question is whether there also was a fragile banking sector that precipitated the currency crisis. He notes that there is no evidence that German banks were acting badly, as there is little evidence of structural weaknesses or instability among German banks preceding the currency crisis.

Ferguson and Temin (2003) provide evidence that demand deposits did not fall at all in the crisis. If it indeed were a banking crisis, demand deposits should have been withdrawn quickly. Time deposits were steady through the end of May 1931. Time deposits did fall sharply in June, but the fall was concentrated in big banks. The shift from less liquid to more liquid deposits did not imply a panic, but suggested precautionary activity by depositors on a small scale (in anticipation of possible currency problems) that did not threaten banking stability. Moreover, there

was no sign of banks calling in loans, and the deposit-currency ratio did not decline. Ferguson and Temin (2003, 2004) argue that the expectations that chronic budget deficits would be monetized led to a currency crisis, which provoked the deposit withdrawals of May and June 1931.

James (1984, 1986) treats the crisis as a run on German banks, but the banking crisis "was a consequence of weakness and difficulties in the sphere of public finance which led to a German loss of confidence in financial markets" (James, 1984, p. 71). Balderston (1991, 1993) likewise presents the crisis as a banking crisis and claims that a banking crisis had been developing before the June crisis.

Schnabel (2004) argues that the German crisis of 1931 was a twin crisis caused by imprudent bank behavior. She emphasizes the weakness of some German banks, namely the great branch banks, before the crisis. In contrast to Peter Temin, who argues that the ultimate cause of the German crisis of 1931 was currency and not banking fragility, Schnabel (2004) suggests that the crisis had two *independent* causes: currency and banks. For currency, the political instability and despairing fiscal situation shook investors' confidence in Germany's commitment to the gold standard and its willingness to serve its foreign debt, thus leading to a run on the Reichsmark. For banks, the excessively risky business policies of the largest German banks led to large-scale deposit withdrawals that were independent of the currency situation. Even before the crisis had started the great branch banks were vulnerable with respect to their liquidity and solvency positions. Because of their heavy dependence on bills of exchange for their liquidity and their low cash liquidity, the great branch banks could easily fall into difficulties if the Reichsbank was unable to provide liquidity through the discount window. There was also a steady decline in equity ratios, indicating banks' excessive risk-taking caused by the moral hazard problem. Over the course of the crisis, the run on the Reichsmark and the withdrawals at German banks were reinforcing each other.

Adalet (2003), like Schnabel (2004), offers that banks were the cause of the 1931 crisis. Specifically, he claims that weaknesses in the banking structure (such as low capital and liquidity) were built up in the early 1920s, but were disguised by the capital inflows between 1925 and 1928. His econometric analysis shows that bank

fundamentals matter for the failure of banks even after controlling for macroeconomic and international factors. Table 1 provides a brief summary of the related studies.

Why does it matter to distinguish between the possible causes of the 1931 crisis? First, it is related to the question about which policies went astray and how the crisis spread. Advocates of a currency crisis suggest the crisis was domestic in origin, and the failure was more political than economic (Ferguson and Temin, 2003). If the cause was currency, then political disturbances in early June, especially Heinrich Brüning's rash statements about a customs union between Germany and Austria and his denunciation of reparations, can be blamed for the depletion of the Reichsbank's reserves (Temin, 2008). If banking fragility was the cause of the crisis, then the banks were not mere victims of macroeconomic shocks. The Reichsbank also carried part of the responsibility as it failed to manage the moral-hazard problem that fostered the risky business of the great branch banks (Schnabel, 2004).

Second, it is also related to the question of whether an alternative policy and outcome was possible. If currency was the cause, then earlier control on trading in the Reichsmark, or had Brüning not announced that Germany could no longer pay reparations, would have saved the German banks. The banking crisis could have almost certainly been avoided. Even in the end, going off gold was unavoidable, and the damage caused to the German economy would have been less (Ferguson and Temin, 2003, p. 33). In case the banks were the problem, the implication is "that the crisis of 1931 would not have occurred if the banks had acted with caution in the 1920s" (Schnabel, 2004, p. 867).

In this paper we argue that the crisis presents a new dimension that is not included in the banking versus currency crisis story. What triggered the crisis was Germany's aggressive borrowing in the late 1920s that resulted in a triple crisis involving sovereign debt, foreign exchange, and the banking sector. Balteanu and Erce (2014) examine 19 episodes in which sovereign defaults end in banking crises. They find that in such an event, there is an increase in the banking sector's public debt holdings ahead of the banking problem; an increase in the amount of liquidity support provided by the central bank to the banking sector; a dramatic cut in public

expenditure in the aftermath of defaults; a larger negative impact on growth and a slower recovery; a marked fall in inflation rates; sharp drops in portfolio capital inflows; and a shift in the composition of foreign borrowing towards shorter maturities. The German crisis of 1931 shares many of the above-mentioned features. In our interpretation, the room for maneuver by the German government was more limited than commonly thought.

The rest of the paper is structured as follows. Section 2 provides a brief description of the framework we use to explain the German crisis of 1931. In the literature, the framework is called original sin, sudden stop, or fragility of incomplete monetary union. Section 3 presents two historical cases, the Russian 1998 crisis and the Argentine 2001 crisis, which are precedents of the German crisis. Section 4 restates the German crisis of 1931. The final section compares our interpretation and those of existing studies in the literature.

2 Incomplete Monetary Union and Sovereign Default

A member of a monetary union loses not only its monetary policy, but also its capacity to issue debt in a currency over which it has full control. As a consequence, a sovereign default can be self-fulfilling, driven by a change in market sentiment. This process has been clearly demonstrated in a series of paper by Paul De Grauwe (De Grauwe, 2011, 2013; De Grauwe and Ji, 2011).

The mechanism goes as follows. Suppose investors fear a government default by a member country (denoted by A) and sell A's government bonds. If the acquired money is invested elsewhere, then the money leaves A's banking system and the total amount of liquidity in country A contracts. A's government would then experience a liquidity crisis, as it cannot obtain funds to roll over its debt at reasonable interest rates. Moreover, A's government cannot force its central bank to buy government debt, because its central bank cannot create the needed liquidity. In other words, A's government cannot guarantee to investors that it will always have the necessary liquidity to redeem government bonds at maturity. The liquidity crisis, by raising interest rates and thus increasing the debt burden, may in turn lead to a

solvency crisis. The crisis is self-fulfilling, because it is investors' fear of insolvency that leads country *A* to become insolvent.

This would not happen for a stand-alone country (denoted by *B*) that has the capacity to issue debt in its own currency. Suppose investors fear a government default by country *B* and sell *B*'s government bonds. If investors want to get rid of the acquired money by selling it in the foreign exchange market, then a flexible exchange rate would ensure that *B*'s money stock remains unchanged. Most importantly, a liquidity crisis as depicted above cannot occur, because even if country *B* cannot obtain funds to roll over its debt at reasonable interest rates, it can eventually force its central bank to buy government debt. In other words, *B*'s government can guarantee to investors that sufficient liquidity will always be available to redeem government bonds at maturity. This is possible, because the central bank of country *B* acts as a lender of last resort in the government bond market, which implies that investors cannot precipitate a liquidity crisis in *B* that may force *B*'s government into default.

A sovereign default under incomplete monetary union unfolds as follows. An increase in the government budget deficit, probably caused by a recession or loss of competitiveness, triggers a change in market sentiment. Fear of payment difficulty prompts investors to sell government bonds and liquidity is withdrawn from the national market - that is, a sudden stop of capital inflows occurs. A liquidity crisis pushes up the interest rates, and the liquidity crisis turns into a solvency crisis.

The problem (namely, the risk of runs on government debt) is not unique to a member of a monetary union. It is common to any country whose government cannot rely on a central bank to act as a lender of last resort, such as a country on a fixed exchange rate regime with open capital accounts (in which that country commits itself to the convertibility of its currency to a foreign currency for which it has no control, and therefore the promise to convert domestic currency into foreign currency at a fixed exchange rate cannot be guaranteed, because that country's monetary authorities have only limited amount of foreign reserves) or a country that has issued a substantial part of its debt in foreign currency (Winkler, 2011).

Such a crisis (bad equilibrium) has implications for the banking sector and government finance. Domestic banks, usually the principal holders of government bonds, incur significant losses on their balance sheets as interest rates on government bonds rise. Moreover, domestic banks are caught up in a funding problem, having to pay prohibitive interest rates in order to roll over their deposits. A sovereign crisis thus spills over into a banking crisis, even if domestic banks are sound at the beginning.[1]

A crisis-induced recession further increases government budget deficits, which make investors even more distrustful of the government's capacity to service the debt, thus triggering enhanced liquidity shortage and concern over solvency. The government is not just deprived of its budgetary policies to stabilize the business cycle; it is even forced to institute austerity measures in the midst of a recession.

A country that suffers from a crisis under an incomplete monetary union can thus be hit by sovereign debt and banking crises. A sovereign debt crisis forces the authorities to adopt budgetary austerity, which in turns intensifies the recession. Banks trapped in a funding crisis cut their credit to the economy. In the end, the austerity programs fail to reduce budget deficits, because of the high interest rates to roll over the sovereign debt and the slowdown in economic activities.[2] Below, we start from two recent examples that follow closely the line of crisis development described above: the Russian financial crisis of 1998 and the Argentine financial crisis of 2001.

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[1] Sosa-Padilla (2015) presents a model in which sovereign defaults lead to banking crises and contractions in bank credit and economic activity. When banks are highly exposed to government debt, a sovereign default incurs considerable losses to the banking sector, which in turn cause the banks to reduce their lending to the private sector. Given that production firms are in need of working capital, a contraction in credit translates into an output decline.

[2] The sudden stops proposed by Calvo has the same implication as the theory of incomplete monetary union, but in the sudden stop theory of Calvo, the exchange rate regime is less relevant. For example, Izquierdo (2002, p. 922) observes that "Under these conditions, the change in the equilibrium real exchange rate needed to accommodate a sudden interruption in external financing was large. The expectation of a large real depreciation, in turn, led to a large revaluation of public sector debt relative to GDP and to substantial deterioration in sustainability of the fiscal position. As a result of this deterioration, the fiscal adjustment effort and the reduction in public debt that was required to achieve sustainability increased very dramatically, leading to fears that a public-debt default was imminent. … An interesting point is that this vulnerability is independent of the exchange rate regime that is adopted."

3 Two examples

3.1 The Russian Financial Crisis of 1998

Like the other cases we discuss here, the Russian crisis was a triple crisis, which involved the foreign exchange market, the banking sector, and public debt, and with a sovereign debt crisis playing the central role.

The Russian crisis broke out on August 17, 1998 when the government abandoned its fixed exchange rate against the U.S. dollar and devalued the ruble, defaulted on domestic government debt that was followed by a restructuring, and announced a 90-day moratorium on external commercial debt payments (Cooper, 1999). The ruble fell from 6.27 rubles to the dollar on August 17 to 21.83 rubles to the dollar on September 20 (Figure 1).

Several factors contributed to the Russian crisis: capital outflow from Russia after October 1997 due to the Asian crisis, the drop in world oil prices, political instability, and the reluctance of the Duma to ratify the anti-crisis program in July 1998.[3] The direct cause of the crisis was the fiscal imbalances of the Russian government, which failed to generate sufficient tax revenues to meet its expenditures.[4] Starting from 1995 until the onset of the crisis, the government depended mainly on issuing government bonds, so-called GKOs, to finance its budget deficit. Since the government's debt-servicing capacity was not optimistic, the government was forced to depend on debt with short maturities and with high interest rates. Yields on GKOs were high in order to attract capital, thus increasing the debt-serving burden of the government. In 1998, about one third of public spending went to debt servicing. Most GKOs were short-term and had to be rolled over constantly. About one third of GKOs were held by foreign investors and

[3] Commodity prices began to decline in October 1997 after the Asian crisis, because of lower demand from Asia. Commodity exports, among them oil, natural gas, and metals, accounted for about 70 percent of Russia's total exports. Figure 1 indicates that the current account surplus declined in 1997 and then became negative in the first half of 1998. Malleret et al. (1999) provide a detailed description of the anti-crisis program.

[4] For more details about the collapse of the tax system and inadequate tax collections, see Gobbin and Merlevede (2000).

exceeded Russia's foreign reserves at the beginning of 1998 (Popov, 2000). [5] The Central Bank of Russia (CBR) would not be able to prevent ruble devaluation if a reversal of capital flows were to occur. Obviously, the amount of CBR's foreign reserves was incompatible with defending the fixed exchange rate at that time. The dependence of Russia on short-term foreign borrowing gradually increased.

The ruble first came under attack in November 1997.[6] CBR sold its reserves to defend the exchange rate target, and its reserves declined by US $6 billion in November (Montiel, 2014, p. 169). A new attack in January 1998 resulted in net capital outflows, followed by a downgrade of Russia's sovereign debt by both Standard & Poor's and Moody's.

In an attempt to stabilize the economy and to reaffirm his commitment to reform, President Boris Yeltsin replaced Prime Minister Viktor Chernomyrdin with Sergei Kiriyenko in late March. However, the appointment was strongly resisted by the Duma and was rejected twice before finally approved on a third vote.

The crisis entered an acute phase in May, marking the beginning of the collapse of Russia's financial markets, as political instability and poor export performance made investors become concerned about the Russian government's capacity to service the debt, resulting in capital outflows and a sharp increase in GKO yields, which doubled from 27.8% in April to 54.8% in May (Montiel, 2014, p. 169). President Yeltsin signed a new austerity budget on May 26, but it had little effect on investor confidence. On May 27, CBR even raised the refinance rate to 150% to stem capital outflows.

Pressures on the ruble eased in June. To improve the maturity structure of the debt and to reduce the interest payment on debt, on June 4 and June 18 the Russian government swapped short-term ruble-denominated GKOs for long-term dollar-

[5] To switch from money to debt financing of a fiscal deficit, GKOs, ruble-denominated short-term debt instruments, were first introduced in May 1993. Long-term government bonds called OFZs were introduced in June 1995. Since investors were unwilling to accept long maturities, a majority of the debt continued to be issued at maturity of less than one year and had to be rolled over repeatedly. Beginning from 1996, foreigners were allowed to participate in the GKO-OFZ market. By 1998, about one third of GKOs were held by foreigners, while the rest were held by Russian banks and CBR.

[6] For an account of the policymaking process preceding the sovereign default on August 17, see Buchs (1999) and Malleret et al. (1999). For a chronology of key events surrounding the Russian crisis, see Kharas et al. (2001).

denominated Eurobonds. About one tenth of GKOs, worth US$4.4 billion, were swapped for long-term Eurobonds on July 20, 1998 (Malleret et al., 1999). However, such an attempt to lengthen the maturity and to change the denomination currency was of little help, because the terms of the debt and the fact that Russia had limited foreign reserves only further undermined the government's perceived solvency. In fact, Kharas et al. (2001) show that the default risk premium kept on increasing even after the GKO-Eurobond swap.

Instability soon returned in July as the Duma resisted the fiscal reforms. Figure 1 shows that CBR's reserves reached a new low in July, and GKO yields hit about 300% in mid-August. Gobbin and Merlevede (2000) show that from June the GKO market had evolved into a Ponzi game, using new issues for the sole purpose of servicing the old ones. The foreign reserves were about US$11 billion at the end of May and were augmented in July by a US$4.8 billion loan from IMF. CBR expended by US$8.8 billion in foreign reserves over July and August to defend the ruble (Cooper, 1999). [7] Both Moody's and Standard and Poor's once again downgraded the government's credit rating. "The situation in the first half of August thus included a rapid drain of reserves, rapidly rising premia on government debt, continued difficulty in persuading the market to roll over GKOs, a commercial banking system imperiled by its large holdings of government obligations, and no prospect of additional external assistance" (Montiel, 2014, p. 171). These events obliged "the government to pursue its austerity plan under the least favorable conditions, compounded by the effect of a self-fulfilling prophecy: fears of default adversely impact fundamentals" (Malleret et al. 1999, p. 114).

The crisis finally broke out on August 17. The exodus of capital in anticipation of a default or devaluation led to the depletion of foreign reserves and a devaluation. In addition to the above-mentioned ruble devaluation and unilateral freeze on government debt, controls on capital outflows were also imposed. During the crisis period of August-September 1998, even the high interest rates on government bonds

[7] On July 13, the IMF announced that Russia would receive US$22.6 billion in loans in 1998 and 1999 as part of an aid package. However, the loans eventually disbursed, US$4.8 billion on July 21 by the IMF and US$0.3 billion on August 7 by the World Bank, were far less than the loss in foreign reserves to defend the ruble (Kharas et al., 2001). The IMF support failed to engender market confidence.

could not prevent capital outflows from the government bond market (Mortikov and Volonkin, 1999).

Fiscal imbalances were the main cause of the Russian problem, with banks playing a small role in the crisis. The default on August 17 was followed by a liquidity crisis and runs on many banks (Perotti, 2002). The main causes of the banking crisis are the ruble devaluation and the default of government bonds.

Following the 1988 banking reform, in Russia commercial banks mushroomed over all the country: the number of commercial banks was 225 in 1989, 1500 in 1992, and about 2500 in 1995. About 80% of banks operated with low funding capital and thereby created some systematic risk. The number of banks fell briefly as the CBR adopted a more rigorous supervision policy that began in 1995, with the number of banks dropping to about 1600 by July 1998 (Buchs, 1999). The Russian banks did not act as intermediaries of savings for investment. Their main activity was to lend money to the government by buying government bonds. They also speculated in the foreign exchange markets. The banking sector was small, as bank assets comprised only about 35% of GDP in early 1998.

Russia's banking sector did not cause the crisis, but the banking sector was not without problems. There is some evidence that the banking sector was fragile before the crisis. The number of banks increased from fewer than 10 to over 2500 (Perotti, 2002). The total number of banks in Russia by the beginning of August 1999 was 1500, many of which were inefficient. Russian banks were not very involved in the domestic private sector. Commercial bank credit to the non-financial sector barely reached 8.8% of GDP in 1997 (Buchs, 1999). Russian banks borrowed abroad, which increased their hard-currency liabilities, and used these funds to build up domestic bond holdings (Malleret et al., 1999). This made the Russian banks extremely vulnerable to a ruble devaluation. A significant portion of bank resources had not been used for capital formation, but rather for the purchase of government bonds (Mortikov and Volonkin, 1999).

The crisis soon began to affect the banking sector. First, the ruble depreciation increased the debt-servicing burden of commercial banks that had borrowed in foreign currencies. Russian banks were exposed to devaluation risk, also because

they had sold dollars forward to foreign investors in the GKO market (Kharas et al., 2001). Second, the unilateral restructuring of the ruble-denominated government debt involved large losses for holders of GKOs. By mid-1998, about one third of the assets of the Russian banking system had been put into GKO (Gobbin and Merlevede, 2000). The banking sector was brought down by its extensive direct exposure to the government debt. There were runs on several large banks.[8]

Real GDP contracted by over 4.9% in 1998, as Figure 1 indicates. The inflation rate rose due to the dramatic depreciation of the ruble. Most of the big Moscow-based banks failed. However, the Russian economy recovered much faster than was generally expected. In fact, the slump was short-lived, and the economy began to recover in the second quarter after the crisis. One reason was that the desperate fiscal situation finally induced the government to address the fiscal and tax systems. Fiscal authority was restored as a result of political consolidation. A competitive real exchange rate, due to ruble depreciation, also improved the competitiveness of the manufacturing sector. Finally, the troubles of the Russian financial system did not retard the economic recovery, because banks had a marginal role in financial intermediation. Russia was spared a credit crunch after the crisis, because Russian banks mainly channeled money from domestic depositors and from foreign investors into government bonds and the booming stock market (Ahrend, 1999). The main business of Russian banks was not to channel funds to the real sector, and the amount of intermediated saving was modest. The limited development of intermediation actually helped to explain why the crisis did not have the same impact on real activity as during the 1994 Mexican crisis (Perotti, 2002).

The Russian crisis was by nature chiefly a fiscal crisis and a debt crisis. The Russian crisis is an example of the theory of incomplete monetary union, because Russia was on a fixed exchange rate regime with open capital accounts, while CBR could not act as a lender of last resort. In desperation for liquidity, GKO yields were over 50% by May 27, 1998, became 40-65% by June, exceeded 100% by July, and

[8] An audit in the autumn of 1998 of 18 large Russian banks found that connected lending accounted for over one third of capital losses, while the devaluation of the ruble and GKOs' defaults accounted for 25% and 13% of total losses, respectively (Perotti, 2002). Nevertheless, the crisis itself had a strong impact on banks.

peaked at 135.3% in August, with borrowing being transacted on shorter and shorter terms. Even though the government bonds were denominated in rubles rather than in foreign currencies, the government's commitment to the convertibility of the ruble into foreign currencies and the fact that a large part of the debt was held by foreigners made the policy choice of the Russian government extremely constrained as predicted by the theory. In the end, concern over public debt resulted not only in a sovereign default, but also a currency crisis and a banking crisis.

3.2 The Argentine Financial Crisis of 2001

In December 2001 Argentina defaulted on its external and internal debts, to a total amount of about US$155 billion of central and provincial government debt. Bank deposits were frozen. The currency board, which was introduced into Argentina in April 1991 in order to stabilize the price level and which ensured a one to one convertibility from the peso to the dollar (thus called the Convertibility Plan), was abandoned later in January 2002, followed by a sharp devaluation of the peso (Figure 2).

The Argentine crisis can be traced back to at least mid-1998, when Argentina suffered from a set of external negative shocks: the Russian crisis that led to an increase in the overall Emerging Markets Bond Index (EMBI), which affected capital inflows to and investment in Argentina; the dramatic falls in agricultural prices that caused Argentina's terms of trade to deteriorate by 9% between 1997 and 1999; the deepening recession in Brazil, which was an important destination of Argentine exports; and the strength of the U.S. dollar that affected Argentine export competitiveness (Powell, 2002).

The structural causes of the Argentine crisis were an overvalued fixed exchange rate and an excessive amount of foreign debt (Feldstein, 2002). Public debt in Argentina increased from about 29% of GDP in 1994 to 54% in 2001, mainly due to the deficits of the Social Security administration and the sharp increases in interest payments (Montiel, 2014, p. 235). By September 2001, about 68% of the total debt were made up of bonds overwhelmingly denominated in

foreign currency, and about 30% were made up of loans from international organizations (Lischinsky, 2003). Many creditors holding those bonds were Argentine.

The public debt dynamics between 1998 and 2001 were mainly caused by the cumulative effects of rising interest rates due to the rise in the country risk premium (Damill and Frenkel, 2003). Interest payments accounted for the rise in the fiscal deficit, making the fiscal deficit surge higher despite a significant increase in primary balance surplus. Interest payments as a proportion of exports increased from 23% in 1993 to 41% in 1999 and stayed as high as 38% in 2000 and 2001 (Lischinsky, 2003). Like Russia in 1998, the fiscal imbalance made Argentina vulnerable to external shocks.

The cumulative real overvaluation was estimated to be between 30% and 50% by 2001 (Montiel, 2014, p. 236). The overvalued exchange rate contributed to trade deficits, making it difficult for Argentina to earn the needed foreign exchange to pay the interest on foreign debt. Instead, the government had to continue foreign borrowing to meet the interest payments, causing its foreign debt to growth even larger.

The government offered dollar-denominated bonds, but it received Argentine pesos at the fixed rate of one dollar for one peso. While the government's revenues were in pesos, two-thirds of its debt were dominated in dollars. The banking sector also had large liabilities denominated in foreign currencies. Many bank loans were denominated in dollars, which simply transferred the exchange rate risk to the borrowing firms, most of which were non-traded goods producers. Therefore, currency depreciation had adverse effects for the balance sheets of the government, the banks, and the corporate sector (Montiel, 2014, p. 235).

The above-mentioned external shocks and the structural problems combined to set off the country's destructive debt dynamics. The recession, caused by the external shocks and started from the second half of 1998 and still going on by the end of 2001, reduced tax revenues and thus increased budget deficits. The resulting fear over the sustainability of the public debt caused both sovereign risk premia and market interest rates to rise. The increase in interest rates aggravated the fiscal

problem by increasing the debt-servicing burden of the government and by reducing tax revenues due to a downturn in economic activity. An expansionary monetary policy or exchange rate depreciation was not a choice under the currency board. An expansionary fiscal policy was not possible either, because of little chance to finance it.

As government debt constituted 30% of total commercial bank assets, a sovereign debt crisis quickly spread into a banking crisis, which exerted contractionary effects on the economy and further eroded the government's tax revenues. The incentive to move assets abroad accelerated the demise of the currency board, which once collapsed, worsened the balance sheets of the government and the banks (Montiel, 2014, p. 240).

Serious doubts about the sustainability of the currency board began when the Brazilian crisis broke out in 1999.[9] The possibility of default on Argentine debt started to be discussed in the markets, and some Argentine politicians began to advocate a formal suspension of payments. To address the fiscal problem, the Argentine government implemented a tax increase in January 2000, which aggravated the recession (Powell, 2002). The vicious cycle depicted above played out, as increased fiscal deficits raised concerns over fiscal sustainability and interest rates, which caused economic activity to contract further and worsened tax revenues and the nation's fiscal position.

In March a program of fiscal austerity through expenditure cuts was sent to the Congress. The program met strong resistance within the government, resulting in the resignation of the Minister of Economy, Ricardo Lopez Murphy. The new finance minister Domingo Cavallo undertook some unorthodox measures to promote recovery, and runs on deposits seemed to stop. However, the plan to give more flexibility to the currency board, by pegging in the future the peso to the dollar and to the euro by equal weight and the amendment to the central bank charter that effectively opened the door to last-resort lending, undermined the credibility of the

[9] Perry and Servén (2003) and Dominguez and Tesar (2005) provide a chronology of the 2001 Argentine crisis.

currency board and resulted in the resignation of the central bank president Pedro Pou.

In May the government swapped US$30 billion of government debt, primarily with commercial banks, for debt of longer maturity. The purpose was to reduce the government's short-term financing needs. Even though the swap lowered the government's short-term interest payments in the second half of 2001 and 2002, it correspondingly created a large debt servicing burden in 2003-06. The unfavorable prospect of servicing this future debt only made the government bonds even less attractive and drove up interest rates (Montiel, 2014, p. 243). Izquierdo (2002) also suggests that the government's engagement in the massive debt swap to extend the debt maturity actually resulted in high interest rates, validating the concerns over the nation's fiscal position, and led to an expectation of currency depreciation.

In June a de facto dual exchange rate regime, which operated through export subsidies and import tariffs, was introduced. When it became clear that external financing was unavailable, the fiscal policy changed in mid-2001 by adopting a zero-deficit rule and cutting transfers to provincial governments (Izquierdo, 2002). A zero-deficit policy was announced on July 15. That policy was part of the strategy to make the public debt sustainable. It was an ambitious goal given the severity of the recession. The announcement signaled to the market that there was no further access to IMF funds or to private sector funding, causing risk spreads to increase by 400 basis points and jumping to over 1600 basis points (Powell, 2002). The central banks lost US$3 billion of foreign reserves, see Figure 2.

In late March deposits fell the most since the Tequila crisis following the resignation of Finance Minister Lopez Murphy, as Figure 2 indicates. Deposits stabilized between April and June. Runs on bank deposits returned in July, coinciding with sharp increases in government bond spreads. This was a general run on both peso and dollar deposits and affected all types of banks.[10] The runs on banks caused a credit crunch and losses of foreign reserves, which were down to US$15 billion by the end of November (Montiel, 2014, p. 244).

[10] In the five months starting from March 2001, the banking system lost about US $11 billion, equivalent to 12.8% of total deposits (Kiguel, 2001).

On December 5 the IMF indicated that the next tranche of IMF finance package would not be released, making it plain that Argentina would not be able to make the payment coming due in 2002. The government bond spread rose to about 6000 basis points. In December 23 the government announced a moratorium on public debt. The currency board was abandoned and the peso was floated on January 2, 2002.

The Tequila crisis in 1995 made the government aware of the limitation of the currency board arrangement and the need for greater capital strength liquidity in the banking system. The currency board imposed strict limits on the ability of the central bank to act as lender of last resort, and therefore it was necessary to have a sound banking system so that there would be no need for the central bank to act in that way. In the aftermath of the Tequila crisis, Argentina implemented a reform of its banking sector. [11] De La Torre et al. (2002) show that the Argentine banking system, despite increasingly burdened by bad loans after 1998, was well capitalized, strongly provisioned, and highly liquid through the year 2000. Nonetheless, a hidden weakness was that the banking system became increasingly exposed to the public sector and thus vulnerable to a sovereign debt crisis.

The government started to resort to domestic sources of financing, notably pension funds and domestic banks, after the Tequila crisis, which increased steadily up to 2001. The financial system was significantly exposed to the public sector and thus vulnerable to a sovereign debt crisis (De La Torre et al., 2002). "Total banking system claims on the government rose gradually from less than 10 percent of total bank assets at the end of 1994 to 15 percent at the end of 2000, jumping to nearly 30 percent by end-2001." (De La Torre et al., 2002, p. 10). In other words, when the external financial markets became closed to Argentina, the deficits were instead financed by issuing bonds in the internal market that were held by banks, causing the banking sector to be highly exposed to government risk. The solvency position of banks, which were heavily exposed to sovereign debt, worsened as government bond prices fell. Since most local businesses borrowed in dollars, the devaluation

[11] Kiguel (2001) discusses the major transformation of the Argentine banking system in the 1990s.

caused widespread bankruptcies. Corporate failures in turn caused Argentine banks to collapse (Feldstein, 2002).

The Argentine crisis exemplifies several features of the theory of fragility of incomplete monetary union. First, government efforts to make its finance house in order tended to end in further economic contraction and self-defeat. To maintain the peg between the peso and dollar, Argentina's government tightened macroeconomic policies, raising interest rates and pushing the economy into recession (Feldstein, 2002). Damill and Frenkel (2003) show that active pro-cyclical policies were even implemented to generate larger primary fiscal surpluses. These policies added to the deflationary pressures, but could not stop the increase of public debt.

Second, the crisis was the outcome of a vicious cycle that reinforced itself. Investors, seeing Argentina's increasing current account deficits and increasing foreign debt, became nervous and wanted to convert their pesos into dollars. Dollar reserves at the Argentine central bank declined as investors shifted pesos into dollars, making it more likely that currency devaluation would occur. Powell (2002, p. 7) describes the following vicious cycle leading to the Argentine crisis: "On the one hand, a purely economic cycle included depressed economic activity that negatively impacted tax revenues, along with worsening the fiscal deficit. This was coupled with increasing concerns about debt sustainability, pushing country risk spreads and interest rates higher and reducing investment, feeding back to depressed economic activity."

4 The 1931 German Crisis Restated

The German crisis of 1931 bears many resemblances to the above-mentioned Argentine and Russian crisis. Even though the crisis was triggered and intensified by political turbulences, the structural causes of the crisis were public debt and current account deficits. Since the crisis unfolded closely along the line of the theory outlined in Section 2, below, we arrange the development of the events accordingly.

4.1 The Buildup of Foreign-currency Debt

Since the stabilization of the mark in 1924, except for the year 1925, the German government continued to run a budget deficit, which reached 1.38% of GDP in 1929. The data on quarterly fiscal deficits also indicate that only in a few quarters was the government able to attain a surplus (Figure 3). The deficits were financed by domestic and foreign borrowings, making the public debt to GDP ratio double from 1928 (16.40%) to 1931 (35.20%). This level of public debt may seem harmless nowadays, but for a government that had to meet its financing need on a quarter to quarter basis, this level of debt made the German government extremely vulnerable to external factors. The current account deficit to GDP ratio was 4.28% in 1925. It improved in 1926, but deteriorated again in 1927 (5.10%), and never turned into a surplus before 1931, as Figure 3 indicates.

Under the period of the Dawes Plan, from September 1, 1924 to August 31, 1929, capital flows mainly from the U.S. helped to finance the government debt and the current account deficits. According to Hoffmann (1965, p. 789-791), between 1925 and 1928, foreign borrowing accounted for on average 59% of total new borrowing by the public sector. It decreased to 7% in 1929, when the Great Depression started, but again rose to 79% when the Young Plan was introduced. Just as the easy access to capital after Greece joined the Euro disguised the fiscal imbalances and loss of competitiveness and allowed the Greek government to continue fiscal deficits (Alogoskoufis, 2012), so was the Dawes Plan for the Weimar government.

4.2 Changes in Market Sentiment

A recession or a stoppage of capital inflows could easily tilt down this artificially maintained imbalance. In fact, this was what started to happen in 1930, when net capital inflows reduced from 2,304 million in the previous year to only 490 million Reichsmark, caused by outflows of securities investments and capital flight (Schuker, 1988, Table 7). The world economic recession, the end of the Dawes Plan,

and the uncertainty surrounding the negotiations of the Young Plan, exposed the fiscal imbalances of the German government. There was a currency crisis in the spring of 1929 and a banking problem in August 1929 (Schnabel, 2004). As long as capital kept flowing in, these episodes did not cause much problems and total deposits as well as the Reichsbank's gold cover quickly resumed.

Figure 3 reports Germany's budget deficits. Starting from the fourth quarter of 1929 and until the outbreak of the crisis in July 1931, with the exception of the third quarter of 1930, the government was not able to balance its budget. In fact, signs of a problem showed up as early as February 1929 when the German Ministry of Finance sought to obtain credits from month to month to meet its deficits. The Ministry of Finance opened a running credit with the German banks in the middle of March and subsequently making it a regular practice in German finance (Schacht, 1931, p. 87-88).

4.3 Withdrawal of Liquidity and Sudden Stop in Capital Flows

The withdrawal of foreign exchanges, at first slowly but then at an increasing tempo, had clear implications for both domestic and foreign investors who had followed closely the foreign reserves level of the Reichsbank. Any event that could cast doubt on the German government's ability to service its debt would trigger a change in market sentiment, which would in turn lead investors to withdraw liquidity from the German market. The bad economic fundamentals made the self-fulfilling crises become possible.

A trend of capital outflows started from July 1930 under the government crisis and was intensified by the Reichstag election in September 1930 when the Nazi Party dramatically increased its number of seats from 12 to 107 and became the second largest party in the Reichstag. The Reichsbank lost about 17% of its foreign reserves between July and October 1930, as Figure 3 indicates.

Capital outflows entered a grim phase in May 1931, when the renowned Austrian bank, Credit Anstalt, announced huge losses. In a single month, the

Reichsbank lost about 33% of its reserves. Deposits by commercial banks, shown in Figure 3, followed the same pattern as the foreign reserves of the Reichsbank.

4.4 Self-defeating Austerity Measures

The government (under Heinrich Brüning) undertook several attempts to calm the public. Unable to pass the fiscal reform proposal in the Reichstag, the government resorted to the issue of an Emergency Decree on June 5 that increased consumption tax and cut civil service pay and social payments. For the government, fiscal austerity was a signal to the market that the government was serious about cleaning itself up. However, such an austerity policy amid a crisis was only self-defeating. For both domestic and foreign creditors, as long as the Reichsbank did not have enough hard currencies for disposal, there was always a danger that the creditors might suffer from a capital loss. A policy-induced contraction, which increased government budget deficits, made investors even doubtful of the government's ability to service the debt and deprived further autonomy in government finance.

Figure 3 reports the German, the U.S., and the U.K. central bank discount rates, respectively. In July the discount rate of the Reichsbank is rose to 7%, making the discount rate difference between Germany and the U.S. as high as 5.5%. The policy was unable to stop capital outflows. On July 3, 1931, gold cover of the Reichsbank fell below the mandatory cover for the first time. A general banking crisis erupted on July 13, as the failure of Darmstäter und Nationalbank on July 13 led to a general run on banks and forced a closure of all German financial institutions. A number of banks declared themselves illiquid. Banks were reopened after two days for limited business, but normal operations were first resumed on August 5. The crisis reached its full scale when on July 15 the Reichsbank suspended convertibility of the Reichsmark into gold and imposed capital controls, which set an end to the gold standard in Germany, as well as a de facto moratorium on German foreign debt.

4.5 Spillover to The Banking Sector and Government Finance

By incurring high short-term foreign debt, the German banks put themselves and the Reichsbank in a vulnerable position. The big German banks incurred high foreign debt (in form of foreign deposits), mostly denominated in foreign currency. By mid-1928, 42% of credit bank deposits were owed to foreigners (Balderston, 1991). Foreign-owned deposits at German banks were usually in foreign currency and Reichsmark deposits were less common. To limit currency risk, banks re-lent the foreign-currency debt in foreign currency to domestic creditors (Schnabel, 2004, p. 834). The currency risk was hidden, because there was no currency mismatch in most banks' balance sheets. However, as a large part of the foreign deposits was relent as foreign currency loans to German firms, the exchange rate risk did not disappear, but was simply passed onto the domestic clients. Schnabel (2004, p. 840) reports that at the end of 1929, foreign deposits at the great branch banks exceeded the Reichsbank's reserves by 70% and were almost seven times as high as the excess reserves above the statutory 40% gold cover.

The banking sector was affected by the withdrawal of foreign deposits and the resulting liquidity shortage, which drove the money market rate to increase to 9.41%. A part of the public debt was financed via the banks, even though the amount was not able to be determined from banks' balance sheets (Hoffmann, 1965, p. 788). The banks also incurred losses as holders of government debt.

5 A Heuristic Analysis

To support our arguments, we present in this section a simple empirical analysis. Due to the limited observations we have, the analysis does not intend to be exhausted and complete. Instead, it should be regarded as heuristic at best.

Figure 4 presents the relationship between government bond spread and debt to GDP ratio, where the right panel is for the U.K. and the left panel is for Germany. The debt to GDP ratios for both Germany and the U.K. are taken from Abbas et al. (2010). Yields on long-term government securities for both Germany and the U.S.

are taken from Homer and Sylla (2005), while long-term government bond yields for the U.K. are taken from the "A millennium of macroeconomic data" provided by the Bank of England.[12] We compute spread as the difference between long-term government bond yield of each country and that of U.S. government bond. The public debt to GDP ratio in the U.K. ranges from 155% to 194%. It is much higher than its German counterpart, which ranges from 4% to 24%. The German hyperinflation before 1924 swept out almost all domestic debt, making the burden of public debt in the 1920s rather low in Germany when compared to the U.K. level.

However, the U.K. enjoyed a lower government bond spread in spite of a much higher public debt to GDP ratio. Germany, although incurred a lower debt to GDP ratio, had to pay much higher interest rates to government bond investors. The reason is that the most substantial part of Germany's debt was foreign, while in the case of the U.K. it was denominated in domestic currency. Investors demanded from Germany, a country that had only limited supply of foreign reserves, higher interest rates. Ritschl (2012) likewise emphasizes that since Germany's debt was foreign, a seemly low debt to GDP ratio in Germany does not imply government debt sustainability.

The changes in government bond spread between 1930 and 1931 are the best demonstration of the contrast between Germany and the U.K. Germany's debt to GDP ratio increased from 1930 to 1931, which caused its government bond spread to increase substantially (by over 5%) at the same time. The U.K. debt to GDP ratio also increased from 1930 to 1931, but its government bond spread, instead of seeing an increase, actually decreased somehow.

Table 2 reports the results of the regression of government bond spread on the debt to GDP ratio. Column 2 shows that for the U.K., there is no strong relationship between government bond spread and debt to GDP ratio. The coefficient of the debt to GDP ratio is even slightly negative. Column 3 adds a 1931 year dummy to the regression. The results remain unchanged.

[12] https://www.bankofengland.co.uk/statistics/research-datasets

Column 4 reports the results for Germany. The coefficient of the debt to GDP ratio is also insignificant, and slightly positive. However, the 1931 year dummy, indicated in column 5, is strongly significant. The estimate shows that in that year, the German government bond spread increased by 6.29% that deviate from the historical relationship between government bond spread and debt to GDP ratio. This strong deviation from the historical pattern is consistent with our interpretation that the German 1931 crisis had an element of the self-fulfilling crisis because in the shortage of foreign reserves, investors' sentiment can easily impose a rise in interest rate on a sovereign.

6 Conclusion and Discussion

Our interpretation of the German crisis is based on the theory of the fragility of an incomplete monetary union proposed by Paul De Grauwe. The theory implies that a sovereign default, banking crisis, and currency crisis have a common cause - namely, borrowing in a currency that a sovereign cannot control and the resulting high level of foreign-currency denominated debt.

The current literature proposes the German crisis as either a currency crisis or a banking crisis, as Table 1 indicates. Our interpretation of the German crisis differs from the current literature in that we suggest that neither the currency-crisis view nor the banking-crisis view is complete. In fact, the German crisis has a deeper and common cause, and currency devaluation are the results and not the causes of the crisis.

This new perspective also implies that both domestic and foreign factors have contributed to the German crisis. On the domestic side, the German government had allowed Germany's foreign debt to build up before the crisis, and its unwise political provocation only accelerated the changes in market sentiment. On the foreign side, investors did have the ability to bring a country having a limited amount of foreign reserves to his knees and add a self-fulfilling element to the crisis. Our interpretation also suggests that the crisis of 1931 would not have occurred if earlier control on the

buildup of foreign-currency debt were imposed. Abandoning the gold standard would not prevent the crisis.

Moreover, we also arrive at a different conclusion about the role of the fiscal factor in the crisis, the contribution of the gold standard to the crisis, the constraints facing the German government, and interpretation of Heinrich Brüning's economic policy, as we explain one by one below.

Our paper emphasizes the fiscal aspect of the crisis. Some earlier studies, such as James (1986) and Ferguson and Temin (2003), also point to the budgetary problems of the Weimar Republic, but the mechanism that brought down the currency and the banks is different as the one proposed here. For example, Balderston (1993) blames the fiscal malmanagement of the German government for the withdrawal of capital flows. Chronical budget deficits seemed to imply that the German government would have to monetize the deficits, therefore threatening the gold standard. The threat of devaluation then precipitated capital flights. In our interpretation, budget deficits contributed to the crisis, because they were at the root of the buildup of foreign debt. Budget deficits harmed the banking sector, as a part of the public debt was financed via the banks.

Like Peter Temin, we argue that the gold standard was the problem, and the Weimar Germany was a typical example of the consequences of a fixed exchange rate. We agree with him as he stresses that a fixed exchange rate regime prevented the German government from acting as a lender of last resort. Temin is also right as he blames the gold standard mentality for the cause of the German crisis, as far as it means that the German crisis was not a unique historical case, but was the outcome of a systematic problem in the gold standard. The Reichsbank, to safeguard the gold standard, could not act as a lender of last resort when the mark was threatened. As he convincingly points out, the need to support the value of the mark made the reserves of the Reichsbank (and thus the domestic money supply) vary according to the foreign exchange markets rather than domestic conditions. The gold standard therefore created a potential conflict between the domestic and international roles of the Reichsbank.

By emphasizing the linkages between public finance, currency, and banks, as we do here, we arrive at a new perspective on the constraints facing the German government, as well as a different interpretation of Heinrich Brü ning's austerity policy amid the crisis.

Temin (1993, p. 95) finds it paradoxically that "In one of the great ironies of history, Chancellor Brüning did not take advantage of this independence of international constraints and expand by increasing government spending or easing credit. He continued to contract as if Germany was still on the gold standard, as evidenced by the falling prices … " He claims this reflects a typical gold-standard mentality.[13]

If we instead look at the event from the working of the incomplete monetary union, then what happened in Germany becomes understandable and not a paradox. Anyone familiar with the Greek experience after 2010 would understand what this means.[14] Brüning's seemingly paradoxical behavior, continued to contract as if Germany was still on the gold standard, was not dictated by gold standard mentality, but instead was dictated by the constraints impose on him in a sovereign default that forced to react in a way as it actually was.

When comparing Spain to Germany, Temin (1993, p. 97) is aware that "unlike the Reichsbank, the Bank of Spain was not bound by the inflexible standards of the gold standard." The Spanish peseta had been floating since several decades before

[13] "In one of the great ironies of history, Chancellor Brü ning did not take advantage of this independence of international constraints and expand. He continued to contract as if Germany was still on the gold standard. He ruined the German economy - and destroyed German democracy - in the effort to show once and for all that Germany could not pay reparations" (Temin, 2008, p. 16).

[14] Since Greece entered the Eurozone, its government bonds have been denominated in euro, a currency the issues of which the Greece government has no control. The consequence of this institutional arrangement is to make the financial market in a position to force Greece to default on credit (De Grauwe, 2014). Specifically, as the financial market was worried about Greece's solvency, investors sold Greek government bonds and used the euros they obtained to buy government bonds of other euro-zone countries. The same amount of euros left the Greek banking system, resulting in the reduction of money supply and liquidity. The Greek government experienced a liquidity crisis because it could not obtain funds at a reasonable interest rate to renew its debt. If Greece had an independent currency, the Greek central bank, as the lender of last resort, could issue currency to redeem government bonds, and the liquidity crisis would not happen. Since the Greek government and the Greek central bank have no right to issue euros to repay maturity bonds, the liquidity crisis has worsened into a debt crisis. The tightening of liquidity has triggered high-interest rates and increased the burdens to service the debt. It also forces the government to reduce expenditures and to raise taxes. Such austerity policies have incurred high political costs, causing the government to stop paying debts and declare defaults.

the First World War. Unlike most European countries that reverted to the gold standard by the late 1920s, Spain was the only major country operating on flexible exchange rates at the onset of the Great Depression (Choudhri and Kochin, 1980). In fact, this is exactly a good case for the theory of incomplete monetary union, because a stand-alone country like Spain could not be forced into default and would not suffer from the kind of banking illiquidity as that which happened in Germany. If Germany in 1931 incurred only domestic-currency debt and not foreign-currency debt, then the German government could have simply gotten rid of the debt by inflation, as was what happened during the hyperinflation between June 1921 and January 1924.

Brüning never saw himself as a deflationist. He strongly denied accusations that he had deliberately followed a policy of deflation, for "no government would embrace a policy of deliberate deflation unless it stood in the unique predicament of Germany in 1930, where public spending had spiraled out of control, the Reichstag refused to levy taxes, domestic lenders would not lend, and foreign credits had dried up" (Schuker, 1994, p. 347).[15] Brüning was fully aware of the counter-cyclical spending policy. In fact, the German government had followed an explicit work-creation policy after World War I and the recession of 1926. Brü ning denounced such a spending policy, because it caused problems for the future by increasing the government debt level. Brüning's denouncement of the effectiveness of an expansionary fiscal policy under unsustainable public debt is reminiscent of the recent debate over the effectiveness of austerity in fiscal policy for debt-burdened economies (Monastiriotis, 2014). He was also aware of the need to expand credit vigorously at home. However, the attempt to expand credit was not working (Schuker, 1994, p. 349). The above points indicate that Brüning did not suffer from a gold standard mentality as Peter Temin states.

In Peter Temin's interpretation, the gold standard with free capital mobility posited a dilemma for the Reichsbank. There is a trade-off between the maintenance of the gold standard and the role of Reichsbank as lender of last resort. The

[15] For Brüing's own interpretation of the 1931 crisis, see Schuker (1994, pp. 345-349).

implication is that the banking crisis could have been avoided if the Reichsbank was not committed to the maintenance of the gold standard. However, such a trade-off is nothing but an illusion when a country having a weak banking sector co-exists with a large stock of short-term foreign debts (Begg et al., 2002). In our story, the case is even worse and such a trade-off does not exist, because in the end the Reichsbank could rescue neither the gold standard nor the banking sector. Our view agrees with Schnabel (2004) in that with a high level of foreign-currency debt in the banking system, the Reichsbank could not choose between banking stability and currency stability, because of its limited ability to serve as a lender of last resort. Only an international lender of last resort could have provided the liquidity (foreign currency) needed to prevent the German crisis.

Finally, if political factors did play a role in the German crisis, their effects were more benign than generally thought. Germany in 1931 was central to the European economy. This put Germany in a strong position to demand concessions that would enable her to return quickly to her traditional role (Guinnane, 2015). In contrast, Greece in 2011 did not have any political leverage and did not play an important role in the world economy. These factors put Greece in a much weaker position in negotiating the way out of the debt crisis.

The discussion here also has policy implications for the current Greek crisis. Greece nowadays resembles Weimar Germany, in the sense that it too is sitting on a heap of foreign debt when its recession set in. Exchange rate depreciation is not feasible to Greece, as long as it remains in the euro regime. Devaluation was not available to Weimar Germany either, as long as it was obligated to stay with the gold standard. For both countries, the fact that they have incurred foreign-currency debts (or in a currency over which they have no control) also lay severe constraints on the government to combat the depression. The further pursuit of fiscal austerity can only be self-defeating and aggravate the economic recession. Our discussion suggests that international coordination to provide liquidity, such as debt relief or debt extension, would be of great help to Greece. Even though this is at the expense of other euro countries, this policy would help to mitigate the downturn and fluctuation in Greece's economic activities.

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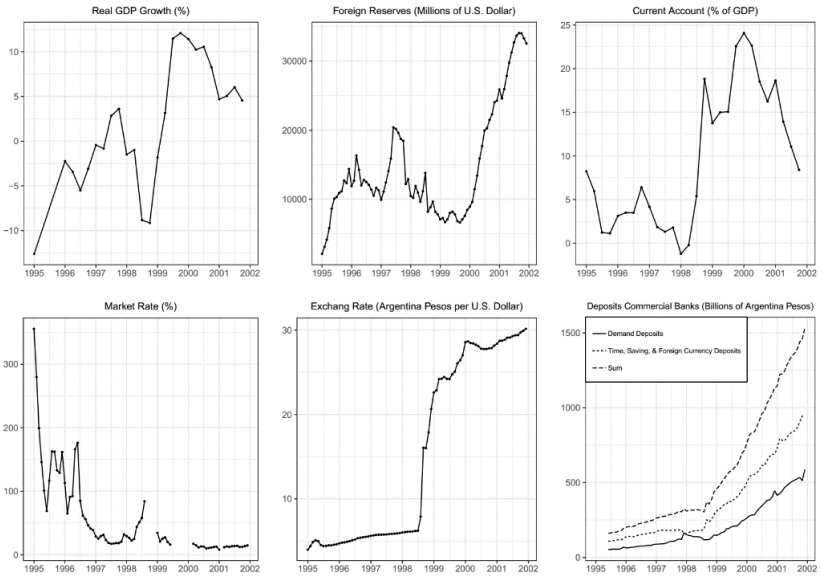
Table 1. A Summary of Related Studies

Study	Findings	Mechanisms
Currency-crisis View		
Ferguson and Temin (2003); Temin (2008)	The German crisis of 1931 originated in the currency market. There is little evidence of structural weakness or instability among German banks preceding the currency crisis.	The expectations that chronic budget deficits would be monetized led to a currency crisis, which provoked the deposit withdrawals of May and June 1931.
Banking-crisis View		
James (1984, 1986)	The crisis was a run on German banks.	Weakness and difficulties in the sphere of public finance led to a German loss of confidence in financial markets.
Balderston (1991, 1993)	The crisis is a banking crisis.	A banking crisis had been developing before the June crisis.
Adalet (2003)	Banks were the cause of the 1931 crisis.	Low capital and liquidity of the banking sector were built up in the early 1920s, but were disguised by the capital inflows between 1925 and 1928.
Schnabl (2004)	The German crisis of 1931 was a twin crisis caused by imprudent bank behavior.	The excessively risky business policies of the largest German banks led to large-scale deposit withdrawals that were independent of the currency situation.

Table 2. Relationship between Government Bond Spread and Debt to GDP Ratio

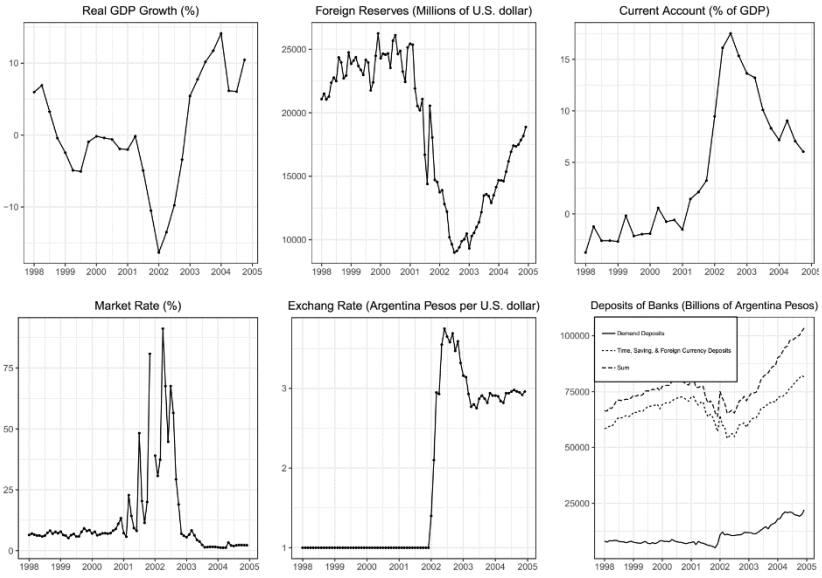
	U.K.	U.K.	Germany	Germany
Debt to GDP Ratio	-0.02	-0.02	0.005	-0.06
	(-1.47)	(-1.77)	(0.04)	(-1.12)
1931 Dummy		0.61		6.29***
		(1.36)		(6.82)
Observations	14	14	12	12
R-squared	0.15	0.28	0.00	0.84

Note: Government bond spread, which is the dependent variable, is computed as the difference between the government bond yield and its U.S. counterpart. Numbers in parentheses are t-statistics. The sign "*", "**", and "***" indicate significance levels of 10, 5, and 1 percent respectively.



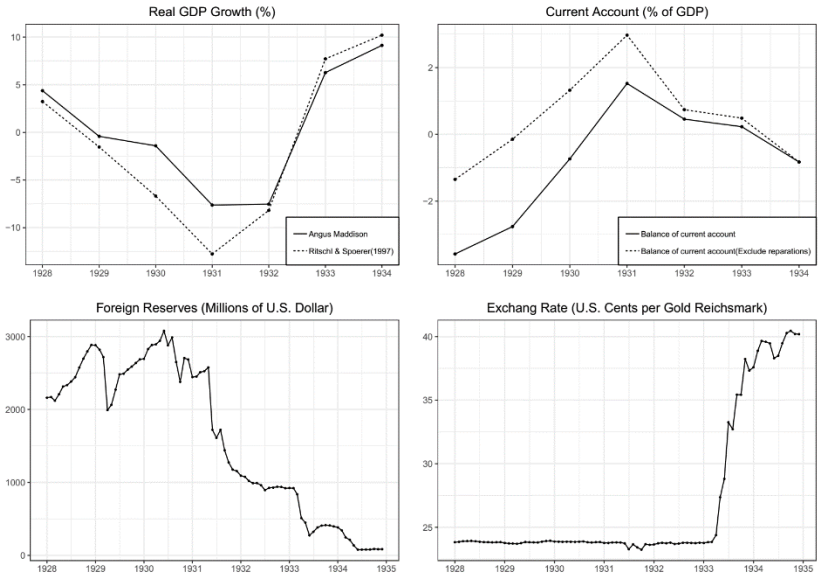
Sources: IMF International Financial Statistics. Budget Deficits are from Bank of Finland.

Figure 1. Russian Economic Indicators, 1995-2001



Sources: IMF International Financial Statistics.

Figure 2. Argentine Economic Indicators, 1998-2004



Sources: Various Publications.

Figure 3. German Economic Indicators, 1928-1934

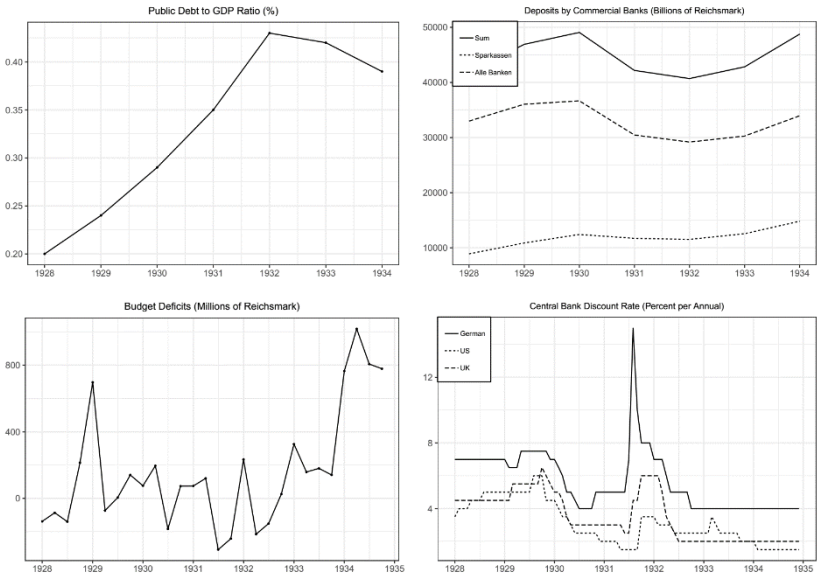


Figure 3. German Economic Indicators, 1928-1934, Continued

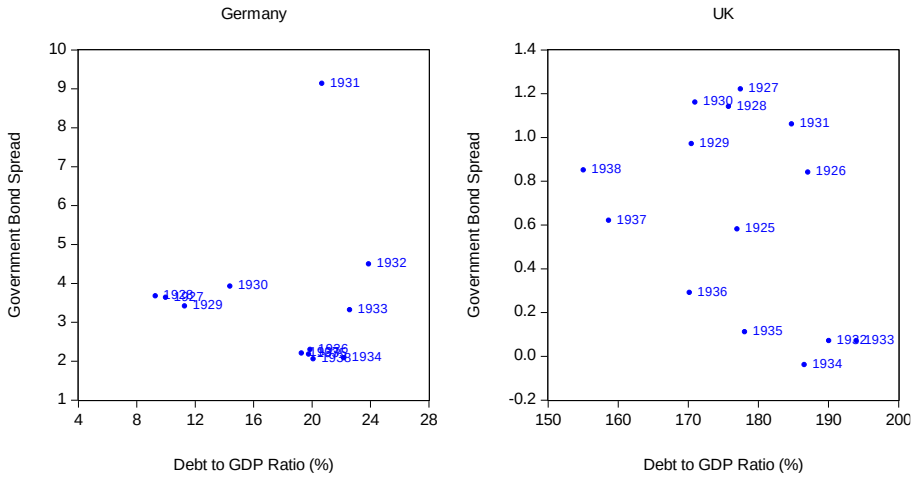


Figure 4. German and U.K. Government Bond Spreads, 1925-1938