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**Economic stagnation in Weimar Germany:  
A structuralist perspective**

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Abstract:

Mexico and Argentina in the 1990s as well as Weimar Germany in the 1920s implemented similar exchange-rate-based stabilization programs which were successful in stopping inflation, but failed to generate the domestic savings and investment rates necessary for a sustainable growth path. It is argued that in both cases substantial foreign capital inflows were attracted by a stable nominal exchange rate and high interest rates, which alleviated the distributional struggle driving high inflation. However, this incentive structure caused a profit squeeze in the tradable goods sector due to an appreciating real exchange rate precipitating the ultimate collapse of the programs.

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## 1. Introduction: Lessons from the present for the past

The demise of Keynesian economic policies in the 1970s did not only change interpretations of the decade's economic crisis, it also led to a re-evaluation of perceived thinking about one of the crucial turning points in German history: the economic collapse of the Weimar Republic. During the reign of the Keynesian paradigm the conventional wisdom held that Reichskanzler Brüning's deflationary policies in the early thirties had caused the devastating nature of the depression. The severity of the German Depression, it was argued, could have been avoided by implementing counter-cyclical monetary and fiscal policies of the type that were believed to have been so successful in the postwar period.<sup>1</sup>

In the late 1970s the prevailing viewpoint was questioned by Knut Borchardt, one of Germany's most prolific economic historians. First, Borchardt (1991) put forth the argument that the Weimar economy was already crippled and on an unsustainable path due to unresolvable distributional conflict. According to this view, real wage growth surpassed productivity growth during the latter half of the 1920s. The resulting profit squeeze depressed investment rates and led to stagnation. Second, Brüning's options during the early 1930s were severely constrained by several internal and external economic and political factors, including the contradictions of the 1920s growth strategy, making the adoption of an expansionary policy impossible. These initial revisionist statements have sparked a vehement response and ongoing discussion which has come to be known as the Borchardt debate (von Kruedener, 1989).

Focusing on the first of Borchardt's claims, the "crisis before the crisis" argument, the paper contributes to this debate by utilizing an analysis of the recent Latin American economic problems after implementing exchange-rate-based stabilization programs to shed new light on the German interwar economy. The discussion presented in this paper therefore follows in Borchardt's footsteps who stated that "it is not the case that one can only learn

lessons from the past for the present—one also learns lessons from the present for the past” (Borchardt, 1991, p. 144). Borchardt’s criticism was inspired by 1970s attacks on Keynesianism which according to the Rational Expectations school and their New Classical followers was neither able to explain nor provide policy solutions for the decade’s experience with stagflation. In contrast, this paper will argue that the analysis of the consequences of exchange-rate-based stabilization (ERBS) programs presents a compelling alternative perspective on the issues raised in the debate. In a number of developing countries, especially in Latin America, these programs have been hailed for their success in reducing inflation but have most recently been questioned because of their association with stagnation and crises. The growing literature on the contradictions of ERBS programs thus addresses economic problems also raised by Borchardt for the Weimar case.

Latin America during the early 1990s as well as Weimar Germany after 1923 were characterized by successful inflation stabilization attempts in the context of relatively open trade and financial markets. In both cases macroeconomic stability, a liberal market environment and liquid international financial markets led to substantial capital inflows. Yet low inflation, liberalized markets and the availability of foreign capital did not promote the domestic savings and investment rates necessary for a sustainable growth path. In fact, ERBS programs often end in crisis. Mexico suffered a severe financial and economic crisis after abandoning its currency peg in late 1994. Brazil had much the same problems after letting the Real float in early 1999. Argentina although still clinging to its currency board is fighting a prolonged recession with high unemployment in 2001. The country also has to cope with international debt levels that many observers believe to eventually lead to a default and the collapse of the currency board. Many economists therefore have raised the question whether the stabilization programs “sow the seeds of their own destruction” (Végh and Reinhart,

1996). Similarly, the question posed here is whether the successful end to hyperinflation in Germany caused the “crisis before the crisis.”

It will be argued that, now and then, inflation stabilization measures based on the exchange rate anchor in the presence of liberal trade and capital accounts create an incentive system leading to destabilizing economic dynamics. The inflow of foreign capital is essential for sustaining stabilization success because it alleviates distributional struggles that caused inflation in the first place. However, the incentive structure to attract foreign funds after high inflation periods consists of stable nominal exchange rates and high interest rates. These conditions tend to create an overvalued exchange rate that will discourage the allocation of resources to the tradables sector, the “engine” for sustainable growth. Countries face a dilemma because they need foreign capital to stabilize their price levels but the conditions for securing foreign help create stagnation.

The argument will be presented in the following steps. First, a comparison of the inflation stabilization programs will be presented in order to establish the similarities between the German and the Latin American cases. Second, the conditions for sustainable growth after stabilization will be compared to stylized patterns of recent ERBS program results followed by a structuralist interpretation of these patterns. Third, I will present a more detailed narrative of the contradictions of the Weimar economy in the 1920s. The final section applies the results to re-evaluate the Borchartt debate in light of the recent developments in Mexico and Argentina.

## 2. External shocks, hyperinflation and stabilization: Weimar Germany and Latin America compared

The purpose of this section is to establish the similarities between the trajectory of Mexico and Argentina since the mid-1980s and that of Weimar Germany focusing on the

causes of inflation and the policies that were implemented to stop it. Monetarist and structuralist explanations of inflation processes are distinguished in order to discuss the crucial determinants of stabilization success which in turn are a necessary prerequisite to better understand the subsequent disintegration of the ERBS programs.

An account of the inflation problems in both periods has to start from the external shocks preceding these episodes in Germany and Latin America, WWI and the debt crisis, respectively. The external imbalances Germany faced in the early 1920s are comparable, if not more severe, than in the aftermath of the Latin American debt crisis in the early 1980s. Under the London agreement of 1921 reparation payments amounted to ca. 80 percent of export revenues. In comparison, Latin American countries had to transfer 30-50 percent of exports abroad in order to fulfill their debt payments in the mid-1980s (Webb, 1988). In both instances high (Mexico) or hyperinflation (Argentina, Weimar) followed.

The monetarist explanation identifies inflation as a purely monetary process. In order to generate resources to service the debt or reparations (and support the passive Ruhr resistance in Germany) governments ran large budget deficits whose monetization raised the price level. The success of ending hyperinflation or high inflation in Weimar Germany and Latin America is attributed to the removal of fiscal imbalances. Hence, the strict imposition of fiscal and monetary discipline is the crucial ingredient for stabilization success (Sargent, 1982; Cagan, 1956).

The alternative to this monetarist interpretation emphasizes the social or structural factors causing inflation (Kindleberger, 1993; Taylor, 1991; Franco, 1986). The additional external demand on the national product (debt or reparation payments) triggered internal distributional conflict over which groups will bear the brunt of the burden. Discussing the German case, Franco (1986) convincingly points out that the after-war level of real wages was at only 60-70 percent of prewar levels in Germany and that there was consequently a

great expectation of catch-up on the part of workers. In fact, “the inconsistency between external balance and the goals of the labor movement was overwhelming; this problem was at the very root of the inflationary explosion” (Franco, 1986, p. 231).<sup>2</sup>

Similarly, Mexican as well as Argentine wages had fallen to half their pre-crisis levels in real terms in the mid-1980s. According to the structuralist interpretation, inflation can be understood as the mechanism by which the additional burden on the economy is distributed to different income groups, the so-called inflation tax. Sooner or later these groups—especially if they are backed by politically powerful organizations—will succeed in indexing their nominal incomes to the rate of inflation. The exchange rate plays a crucial role in this scenario since its continuing devaluation feeds back into the wage-price inflation process, which eventually spirals out of control into hyperinflation.

Explanations for the success of stopping inflation are necessarily based on the theoretical model of the causes of inflation. The pegging of the exchange rate plays a crucial role in the structuralist stabilization scenario. To end inflation in Germany, confidence in the new quasi-currency—the Rentenmark—had to be created by establishing and defending a stable exchange rate to the U.S. dollar until Germany rejoined the Gold Standard in August 1924. The elements of the stabilization programs are summarized in Table 1.

The German stabilization proved to be rather fragile until the third quarter of 1924 requiring very high interest rates during the first year after stabilization. In spite of the credit crunch policy (“Kreditstop”), which was implemented in April of 1924 to confirm the Reichsbank’s credibility in maintaining a stable currency and in spite of a budget that had been in balance since December 1923 the German and foreign public continued to distrust the new currency. The clearest indication of the continued fragility of the stabilization was the sharply upward-sloping term structure of interest rates signaling the continuous inflation worries of the German public.<sup>3</sup> It took the ratification of the Dawes plan to convince

Table 1: A comparison of stabilization policy packages

|                                      | <b>Argentina</b>   | <b>Mexico</b>  | <b>Weimar Germany</b>  |
|--------------------------------------|--|--|--|
| 1. Date                              | - April 1991 convertibility plan   | - December 1987 stabilization plan   | - November 1923 Rentenmark stabilization   |
| 2. International agreements          | - debt rescheduling under Brady plan 1989  | - debt rescheduling under Brady plan 1989  | - reparation reduction and foreign loan under Dawes plan August 1924   |
| 3. Exchange rate and monetary policy | - maxi devaluation preceding stabilization<br>- orthodox shock<br>- fixed exchange rate<br>- currency board (100% gold and forex reserve requirement)<br>- 1992 Central Bank Charter (strict limitations on government borrowing, limited lender-of-last-resort functions) | - maxi devaluation preceding stabilization<br>- heterodox shock<br>- pegged exchange rate          | - fixed exchange rate at prewar parity under Gold Standard<br>- independent Reichsbank<br>- 40% reserve requirement in gold/foreign reserves; 5% required minimum on discount rate |
| 4. Fiscal reform                     | - balanced budget<br>- massive privatization   | - cuts in government spending<br>- privatization<br>- high operational deficit but primary surplus | - cuts in government spending and public employees<br>- tax increases<br>- increasing transfer payments<br>- renewed deficit after 1927  |
| 5. Structural reform                 | - privatization<br>- financial market liberalization<br>- trade and capital account liberalization   | - privatization<br>- trade, capital account, and financial liberalization under NAFTA              | - free capital inflow to private borrowers<br>- some control for public borrowing<br>- liberal trading system  |
| 6. Wage and price indexation         | - prohibited   | - widespread indexation<br>- 'pacto social' has been renewed regularly                             | - state as arbiter in wage negotiation<br>- widespread cartelization in industry   |

Source: Author's compilation

Germans and potential foreign investors of the renewed stability of the Reichsmark. In this sense the Dawes Plan represented the official validation of the new currency by the international community. Most importantly, the resolution of the reparation problem, if only temporarily, relaxed the external demands on the German economy thus easing the distributional struggle at the core of the inflation problem. Economic austerity in



combination with balanced budgets, as advocated by monetarists as the crucial ingredient for stabilization success, was not sufficient to guarantee the stability of the Rentenmark.

In Latin America, the use of the exchange rate as the nominal anchor served the same purpose as rejoining the Gold Standard in the earlier period. In both cases, the fiscal imbalances disappeared as soon as inflation slowed thus restoring government real revenue (Franco, 1986; Dornbusch, 1988). Most importantly, in contrast to monetarist beliefs, the causality between fiscal deficits and inflation runs from the latter to the former. It is the rescheduling and substantial cut of the foreign burden—reparation or debt—together with capital inflows under international agreements—Dawes or Brady plan—that finally regained the confidence of the international financial community and led to a resumption of substantial capital inflows into Latin America and Germany.

Stabilization was successful because foreign capital inflows validated the nominal anchor function of the exchange rate and alleviated the underlying distributional conflict by allowing real wages to rise to socially acceptable levels. This interpretation is supported by the fact that the Mexican stabilization, similar to the Weimar case, proved to be very fragile initially. Only after the debt re-scheduling under the Brady plan lowered the external burden and led to a resumption of foreign capital inflows did stability return more permanently even though fiscal imbalances had been eliminated at the time of the implementation of the stabilization measures two years earlier. Until then falling reserves confirm that the Mexican Central Bank had to constantly defend the exchange rate. In Argentina, in contrast, the stabilization program was immediately followed by capital inflows and the steady accumulation of reserves after 1991.<sup>4</sup>

### 3. The aftermath of exchange-rate-based stabilization in Latin America

The previous discussion has emphasized the role of capital inflows and international agreements in order to help countries stabilize their currencies by alleviating distributional struggles. A number of economists have identified the conditions required to successfully combine inflation stabilization measures and foreign capital inflows in order to embark on a sustainable growth path.<sup>5</sup> Capital flows should be used for investment purposes and not to increase domestic consumption. Moreover, foreign funds have to be channeled into the tradable goods sector in order to be able to create export revenue. This implies a higher investment rate in the tradable compared to the non-tradable sector. In the context of surges in capital flows due to capital account liberalization as in Latin America in the 1990s the policy dilemma is to attract sufficient inflows to restore growth without attracting too much capital which will appreciate the exchange rate. Similarly, can interest rate spreads that foreign investors demand to account for higher country (inflation) risk be kept at levels that balance the promotion of growth and investment with the ability to repay the debt?<sup>6</sup>

In sum, there is a potential contradiction between inflation stabilization and open capital accounts. In fact, a number of stylized facts that have been identified as consequences of ERBS programs in Latin America show that the sustainability conditions were not present after stabilization:<sup>7</sup>

- (1) Currency appreciation: Fixing the exchange rate succeeds in bringing down inflation but domestic consumer prices do not converge instantly to the devaluation rate. The ratio of consumer to producer prices rises. Figure 1 shows that Mexico and Argentina both experienced an appreciation of the real exchange rate, i.e. product wages measured in units of tradable goods rise. The result is a profit squeeze in the tradable sectors.

- (2) Boom-and-bust pattern: Stabilization is followed by a boom in the non-tradable sectors, which is largely fueled by consumption demand. Output in the non-tradable sector tends to grow faster than tradable output, which stagnates relative to its previous trend (Rebelo and Vegh, 1995, p. 133). These imbalances lead severe recession which might be accompanied by currency crises as in Mexico (1994) or Brazil (1999). Or alternatively, the crisis is characterized by prolonged deflation as in Argentina where the currency board is still in place.
- (3) Current account deficits: In all cases the current account deteriorates rapidly, but is financed by foreign capital inflows attracted by high interest rates. In fact, capital inflows more than compensate for the external deficits initially allowing central banks to accumulate reserves. If growth does not resume and inflation worries resurface domestic and foreign investors expect a devaluation and start withdrawing deposits and other portfolio investments. Hence, most program collapses are associated with both banking and currency crises. This dynamic is present in Latin America even though the exact manifestations of the crises differ as indicated under (2).<sup>8</sup>

To explain these patterns the structuralist literature has convincingly emphasized the contradictions between the simultaneous implementation of exchange-rate-based stabilization and open trade and capital accounts (Ros, 1996; Chisari, Fanelli and Frenkel, 1996; Blecker, 1996). While successful at stabilizing prices, this strategy has resulted in other types of distortions, in particular, an overvalued exchange rate. In combination with import liberalization this has caused historically high current account deficits balanced by ample foreign capital inflows. In the structuralist view full-scale liberalization of trade and capital account allow external imbalances to spiral out of control thereby ultimately undermining stabilization. In particular, liberal capital accounts expose recipient countries to the risk of

capital flight. Social contracts, however, can play a decisive role in the long-term success of stabilization. If distributional conflict is at the core of the inflation problem only a socially and politically acceptable sharing of the costs of stopping inflation can guarantee sustainable solutions. But, using the exchange rate as a price anchor needs to be accompanied by a more careful integration into the world economy.

According to this interpretation, the Latin American case represents the contradictions of the neo-liberal stabilization and growth strategy. In particular, the stagnation of the tradable sector in combination with low domestic savings rates led to an unsustainable path of low growth and large current account deficits. Eventually, domestic followed by foreign investors lost confidence in the sustainability of this strategy. Consequently, both the Mexican as well as the Argentine economies suffered a severe crisis. Mexico had to abandon its currency peg altogether after dramatic reserve losses following an attempted orderly devaluation in December of 1994. Argentina maintained its currency board but suffered equally severe reserve losses and a dramatic decline in bank deposits of 18 percent between mid-1994 and March 1995. Both countries required substantial U.S./IMF-led bail-outs without, however, preventing a severe recession with enormous social costs. Alternatively, structuralists propose a less rapid, carefully guided opening of the capital and current account to complement inflation stabilization measures. This would allow policy makers to fine-tune the macroeconomic incentive system, in particular avoiding a pronounced overvaluation of the exchange rate, in order to favor investment over consumption and production of tradable over non-tradable goods. Keeping the fiscal spending in check to achieve macro balance and relying on the deregulation of trade and capital account to provide the “right” incentives does not guarantee a set of conditions conducive to growth.

#### 4. Stabilization and stagnation in Weimar Germany

Economic developments in Weimar Germany show a remarkable resemblance to the Latin American stylized facts. The immediate response after controlling inflation was an increase in aggregate demand especially consumption spending. Foreign capital inflows, in particular from the United States, triggered by the Dawes loan were used to finance the ensuing current account deficits as well as reparation payments. Is Borchardt's previously mentioned claim of a profit squeeze in Weimar Germany due to the same set of factors that plagued Mexico and Argentina after inflation stabilization? He had argued that investment rates were so low because real wage growth surpassed productivity gains in the 1920s. The resulting profit squeeze depressed investment which in turn caused overall stagnation.

There are two basic positions: The investigations following Borchardt's lead find a strong negative effect of profit decline on investment (Borchardt and Ritschl, 1992). In contrast, the Keynesian position identifies high real interest rates as the crucial obstacle to higher investment (Voth, 1995). The former position repeats arguments already put forth by Weimar's employer associations in the 1920s that blamed distributional conflict for low profits and economic stagnation. The Keynesian argument points to a deflationary Reichsbank monetary policy, which kept interest rates artificially high thereby depressing investment. Alternative to these two positions this paper interprets profit squeeze and high interest rates as structural problems that occur simultaneously as the result of the very success of the Rentenmark stabilization. Neither lowering wages nor cutting interest rates were viable solutions to the problem of economic stagnation that plagued the Weimar economy in the late 1920s.

## 4.1 Savings and investment

The starting point is to find out whether ERBS programs are indeed characterized by stagnation relative to other comparable periods. Table 2 shows that the periods following the ERBS programs are characterized by historically low savings and investment rates in combination with relatively high current account deficits and high private consumption rates. A comparison of the post-WWI period with the post-WWII period in Germany is especially revealing. The “Wirtschaftswunder” economy could not only generate investment rates that were roughly six percent of GDP higher than during the Weimar years, it also succeeded in raising savings rates sufficiently to produce a trade surplus. Profits in the business sector could be ensured because productivity growth surpassed real wage gains during this period. In contrast, the Weimar economy was characterized by a relatively high rate of consumption in combination with savings rates that were so low as to generate current account deficits in spite of historically low rates of investment. The data in table 2 confirm that a comparison with the two Latin American economies produces similar results.

Table 2: Stabilization and stagnation

| Period              | Argentina            |                         |                          | Mexico               |                         |                          | Germany              |                         |                           |
|---------------------|----------------------|-------------------------|--------------------------|----------------------|-------------------------|--------------------------|----------------------|-------------------------|---------------------------|
|                     | I<br>ERBS<br>1991-95 | II<br>Crisis<br>1981-85 | III<br>Growth<br>1976-80 | I<br>ERBS<br>1988-94 | II<br>Crisis<br>1981-85 | III<br>Growth<br>1976-80 | I<br>ERBS<br>1925-28 | II<br>Growth<br>1910-13 | III<br>Miracle<br>1950-54 |
| Investment          | 17.8                 | 20.5                    | 25.5                     | 22.1                 | 23                      | 24                       | 11.9                 | 15.2                    | 17.6                      |
| Saving              | 15.3                 | 18.5                    | 25                       | 17.5                 | 27                      | 21                       | 10.4                 | 16.6                    | 20.8                      |
| Current Account     | -2.5                 | -2                      | -0.5                     | -4.6                 | 4                       | -3                       | -1.5                 | 1.4                     | 3.2                       |
| Private consumption | 74                   | 70                      | 63                       | 72                   | 63                      | 68                       | 77.8                 | 74.3                    | 63.4                      |

Sources: Argentina: Fanelli & Frenkel (1996) and World Tables; Mexico: Ros (1996) and World Tables; Germany: Hoffmann (1965) and Schmidt (1935).

Table 3: Saving and investment after ERBS (% of GDP)

| <b>(a) Mexico</b>    |        |          |            |         |          |            |                 |
|----------------------|--------|----------|------------|---------|----------|------------|-----------------|
|                      | Saving |          | Investment |         | S-I      |            | Current account |
|                      | Public | Private* | Public     | Private | Public** | Private*** | VII             |
|                      | I      | II       | III        | IV      | V        | VI         |                 |
| 1988                 | 1.4    | 17.6     | 5.0        | 15.4    | -3.6     | 2.2        | -1.4            |
| 1989                 | 3.1    | 15.6     | 4.8        | 16.5    | -1.7     | -0.9       | -2.6            |
| 1990                 | 6.7    | 12.5     | 4.9        | 17.0    | 1.8      | -4.5       | -2.7            |
| 1991                 | 7.5    | 10.3     | 4.6        | 17.8    | 2.9      | -7.5       | -4.6            |
| 1992                 | 7.1    | 9.5      | 4.2        | 19.1    | 2.9      | -9.6       | -6.7            |
| 1993                 | 6.3    | 8.9      | 4.2        | 17.8    | 2.1      | -8.9       | -6.8            |
| 1994                 | 5.0    | 10.7     | 4.5        | 19.1    | 0.5      | -8.4       | -7.9            |
| 1995                 | 5.3    | 12.2     | 4.6        | 17.5    | 0.7      | -5.4       | -4.7?           |
| <b>(b) Argentina</b> |        |          |            |         |          |            |                 |
|                      | Saving |          | Investment |         | S-I      |            | Current account |
|                      | Public | Private  | Public     | Private | Public   | Private    |                 |
| 1986-90              | -3.8   | 15.1     | 4.8        | 12.2    | -8.6     | 2.9        | -5.7            |
| 1991                 | -1.8   | 15.6     | 2.2        | 12.4    | -4.0     | 3.2        | -0.8            |
| 1992                 | 0.0    | 13.5     | 1.9        | 14.8    | -1.9     | -1.3       | -3.2            |
| 1993                 | 1.3    | 14.0     | 2.0        | 16.4    | -0.7     | -2.4       | -3.1            |
| 1994                 | 0.2    | 15.9     | 1.7        | 18.3    | -1.5     | -2.4       | -3.9            |
| 1995                 | 0.4    | 16.0     | 1.7        | 16.7    | -1.3     | -0.7       | -2.0            |
| <b>(c) Germany</b>   |        |          |            |         |          |            |                 |
|                      | Saving |          | Investment |         | S-I      |            | Current account |
|                      | Public | Private  | Public     | Private | Public   | Private    |                 |
| 1925                 | 2.8    | 9.2      | 2.6        | 13.7    | 0.2      | -4.5       | -4.3            |
| 1926                 | 3.1    | 11.3     | 3.1        | 11.4    | 0.0      | -0.1       | -0.1            |
| 1927                 | 4.8    | 8.4      | 3.2        | 15.1    | 1.6      | -6.7       | -5.1            |
| 1928                 | 4.0    | 9.3      | 3.0        | 13.9    | 1.0      | -4.6       | -3.6            |
| 1929                 | 3.1    | 8.6      | 3.0        | 11.4    | 0.0      | -2.8       | -2.8            |
| 1930                 | 3.8    | 5.8      | 2.6        | 7.8     | 1.2      | -2.0       | -0.7            |
| 1931                 | 2.1    | 3.5      | 2.1        | 1.9     | -0.1     | 1.6        | 1.5             |
| 1932                 | 1.3    | 3.5      | 2.0        | 2.3     | -0.7     | 1.2        | 0.5             |

\*Private savings equal private investment plus the private savings balance:  $II=VI+IV$ .

\*\* The public savings balance equals public savings minus public investments:  $V=I-III$ .

\*\*\* The private savings balance equals the current account balance minus the public savings balance:  $VI=VII-V$ .

Sources: see Table 2

Table 3 takes a closer look at the savings-investment relationship during the periods of stagnation in the three countries. The crucial point here is the widening of private sector deficits in all three cases, i.e. the private sector invests more than it saves thus generating

current account deficits. The problem in the aftermath of stabilization programs is thus not high investment but a falling savings propensity. This constellation is especially clear in Mexico where private sector deficits reached almost double-digit figures relative to GDP in the early 1990s. The public sector, in contrast, contributed savings of between 2-3 percent of GDP during the same period, and only the severe crisis of 1994-5 forced down private sector deficits.

Argentina while having public as well as private deficits succeeded in lowering her public deficit during the 5 years following the ERBS program. Weimar Germany similar to Mexico generated public sector surpluses, which were, however, insufficient to balance out private deficits resulting in substantial current account deficits in the period between 1924 to 1929. Only the onset of severe deflation and depression eventually reversed this pattern and led to current account surpluses. This fact contradicts monetarist positions that point to irresponsible government spending patterns as the culprit behind the eventual collapse of inflation stabilization programs.<sup>9</sup>

The financing pattern of investment in Germany helps to illustrate further this macro relationship. Looking at the sources of investment spending in the 1920s, one of the striking developments in the post-inflation period is the very low contribution of retained earnings (i.e. savings out of profit) to total net capital formation. Based on data provided by Keese (1967, p. 51), retained earnings contributed only 9 percent to investment between 1925 and 1929. According to his data, both public savings with a 41 percent share and foreign savings (36 percent) largely financed investment during this period. Thus, foreign savings contributed more to domestic investment than retained earnings and household savings combined.



## 4.2 Investment and the profit squeeze

Why was the private sector unable to produce more savings that would have generated a more sustainable external balance? The answer is that Weimar Germany was also affected by a profit squeeze in the tradable sector which contributed to investment stagnation and high current account deficits. As in Latin America recently, the exchange rate anchor proved to be an effective tool in stopping inflation in traded goods but prices of non-traded goods took longer to adjust (Figure 1c). Nominal wages are usually indexed to the consumer price index, which largely consists of non-traded goods and services. The pattern of price divergence is similar to the Latin American case. The data show that starting in 1924 consumer prices (as a proxy for non-tradables) rose faster than wholesale prices (as a proxy for tradable goods). In fact, the WPI remained almost constant between inflation stabilization and the middle of 1929 after which there is a strong deflationary trend for both sets of prices. Consumer price inflation is steady during the same period with strong increases between early 1924 to mid-1925 (Institut für Konjunkturforschung, 1936).

The crucial point in Borchardt's argument is that real wages were rising faster than productivity in the aftermath of inflation stabilization. The wage share, which normally moves countercyclically in German history (Block, 1999), actually increased during the short boom of 1926-28. To Borchardt this signified the "sickness" of the Weimar economy (Borchardt, 1989, pp. 141-2). His conclusions were challenged on empirical grounds by Holtfrerich (1984) who argued that Borchardt underestimates productivity advances because he compares output per worker with hourly wages although the average work week declined during this period. Holtfrerich's corrected data—using a CPI deflator—showed that unit labor costs remained relatively stable during the 1920s compared to a pre-WWI benchmark.<sup>10</sup>

The data also show, however, that this discussion neglects a more important issue mentioned above: the divergence of price deflators until 1929. Table 4 compares different

estimates of unit labor costs using three price deflators using annual data on output and wages thereby avoiding the empirical problems raised by Holtfrerich. All of the estimates confirm Borchardt's initial suggestion that real wages did indeed rise faster than productivity but significant differences result from the application of alternative price deflators. Unit labor costs based on consumer prices rise only marginally between 1925 and 1929. To lower consumer wages even further would have been unacceptable to Weimar unions and could have destabilized the young and fragile democracy.

Table 4: Indices of Industrial Unit Labor Costs in Weimar Germany, 1925-1938

|      | Based on annual earnings |       |       | Based on labor cost |       |       |
|------|--------------------------|-------|-------|---------------------|-------|-------|
|      | CPI                      | WPI   | PIF   | CPI                 | WPI   | PIF   |
| 1925 | 100                      | 100   | 100   | 100                 | 100   | 100   |
| 1926 | 100.9                    | 108.7 | 105.8 | 96.7                | 104.2 | 101.4 |
| 1927 | 97.1                     | 104.2 | 107.7 | 94.6                | 101.6 | 104.9 |
| 1928 | 105                      | 114.8 | 111   | 102.5               | 112.2 | 108.4 |
| 1929 | 104.8                    | 120.7 | 113.2 | 101.8               | 117.1 | 109.9 |
| 1930 | 108.4                    | 137.8 | 117.9 | 112.6               | 143.1 | 122.5 |
| 1931 | 111                      | 150.7 | 122.3 | 117.4               | 159.5 | 129.4 |
| 1932 | 102.9                    | 141.8 | 116.6 | 110.8               | 152.7 | 125.5 |
| 1933 | 96.2                     | 135.6 | 111.1 | 104.5               | 147.2 | 120.6 |
| 1934 | 97.7                     | 133   | 112.6 | 99.7                | 135.8 | 115   |
| 1935 | 91.4                     | 119.6 | 103.9 | 92                  | 120.4 | 104.6 |
| 1936 | 90.2                     | 115.3 | 103.4 | 89                  | 113.7 | 102   |
| 1937 | 89.3                     | 113.8 | 103.2 | 87.6                | 111.6 | 101.3 |
| 1938 | 88.9                     | 115.4 | 103.2 | 86                  | 111.6 | 99.8  |

Notes: Indices are calculated with the following formula using annual data:

(earnings or labor costs\*employment)/(price index\*production);

CPI=consumer price index, WPI=wholesale price index, PIF=index of industrial finished goods prices.

Source: Corbett (1991, p. 44 and Appendix A)

In contrast, product wages show a substantial increase using both the wholesale price index and the index of industrial finished goods prices.<sup>11</sup> This is another way of looking at the profit squeeze afflicting the tradable sectors of the German economy.<sup>12</sup> It also closely resembles the aftermath of ERBS programs in Mexico and especially Argentina. Hence, in all three cases tradable prices quickly adjusted to international prices. In contrast, non-

tradable prices that by definition were not exposed to international competition rose more quickly than in the main trading partners.<sup>13</sup>

One way of substantiating the claim of a squeeze in the tradable sector is to compare investment rates to find out whether there is stagnation in tradable vis-à-vis non-tradable investment in Weimar Germany. Figure 2 plots the ratio of tradable to non-tradable investment for the period 1924-1929. Tradable investment is defined as the sum of industrial and agricultural sector investment; non-tradable sectors include utilities, transport, construction, public administration plus wholesale and retail trade. The generally dismal investment performance in the years following currency stabilization was mentioned earlier but figure 2 adds the dimension of a relative decline of vital tradable investment during the 1920s. There is a short recovery of tradable investment in the boom of 1927-8 but a sharp drop thereafter.

So far the analysis lacks a confirmation of the claim that low profit rates do indeed affect investment. After all, in a world of perfect capital markets the ability of firms to generate investment funds internally should not limit investment spending since they can always access external funds. Underlying Borchardt's arguments is the implicit assumption that interwar German capital markets did not conform to the model of perfect capital markets.<sup>14</sup> One way of investigating whether low profits affected investment is to look at sectoral data available for a number of industries. For that purpose profit data taken from Maxine Sweezy (1939/40) are matched with sectoral equipment investment data from official German sources for 15 different industries for the period 1926-38.<sup>15</sup> Figure 3 relates profit to investment rates for the whole period and the years 1926-1930 respectively. For both periods a strong positive correlation between profits and investment activity can be identified.<sup>16</sup> The evidence suggests that the wage squeeze on profits did indeed affect investment through the retained earnings channel. It is precisely the inability of the business sector to generate

internal funds for investment that explains the low savings rates characteristic of Weimar Germany in the period 1925-1930.<sup>17</sup>

The level of profits relative to alternative returns represented by the interest rate gives us another indication of why investment in capacity was low during this period. Real returns on capital during the 1920s were never much above the return on government bonds. Risky investments in capacity were hardly justified by the meager spread. Thus, incentives for private capital formation are weak if large capital gains can be made in the stock market and/or high interest rates prevail in the bond market. In addition, high interest rates also imply a cost squeeze on cash flow of firms adding to the profit-squeeze effect of high real wages.

#### 4.3 Reichsbank dilemmas

It could still be argued that an expansionary Reichsbank policy of low interest rates could have avoided the stagnation of investment. The main problem here is that the monetary authorities face a dilemma when simultaneously trying to control aggregate demand and thus inflationary pressures through interest rate policy as well as generating a real exchange rate that will ensure the competitiveness of the tradable goods sector. A high interest rate policy will, on the one hand, achieve the objective of curbing inflation by sterilizing the monetary effects of accumulating reserves. On the other hand, if the interest differential to abroad is sufficient to attract capital inflows over and above current account financing needs there will be a continuous pressure toward real exchange rate appreciation thereby sacrificing the much needed competitiveness of the tradable sector. In contrast, a low interest rate policy inducing higher aggregate demand will inevitably exert pressure on prices and lead to real exchange rate appreciation that way. It should also be kept in mind that the restrictive Reichsbank Law of 1925 required the Reichsbank to hold gold or currency reserves in the amount of 40

percent of the money supply. An expansionary policy based on domestic credit creation as in 1927 thus had immediately binding legal constraints in much the same way as in Argentina's currency board arrangement today.

The situation in Germany in the first half of 1927 gives an illustration of this policy dilemma. Reichsbank president Hjalmar Schacht warned early on against the impotence of the Reichsbank to control the money supply in the presence of massive capital inflows (Schacht, 1927). The Advisory Board for Foreign Credit, which was founded in 1925 to control capital inflows had very limited influence on public borrowing and no control over private borrowing (McNeil, 1986, pp. 65-67). To curb inflows and regain control over the domestic money market it was agreed in late 1926 to abandon tax advantages to foreign purchasers of German bonds, which were vital for the ability to borrow in New York at the time. Consequently, long-term lending to Germany virtually stopped for a period of six months. The strategy was complemented in early 1927 by the Reichsbank's lowering of the discount rate to 5 percent, the legal limit set by the victors in the 1924 Reichsbank Law. But the domestic capital markets quickly showed first signs of overexposure when the Reich government tried to float a 500 billion Reichsmark bond issue in February, the first since the stabilization. The loan proved too large to be absorbed by the still shallow market. The public was understandably reluctant to hold bonds because the inflation in combination with the 1925 Revaluation Law had resulted in the almost complete expropriation of their previous bond holdings.

In spite of low discount rates short-term interest rates in the money market started to rise causing short-term foreign capital to return in unprecedented volume in March and April. McNeil (1986, pp. 147-8) reports that within two and a half months foreigners sent 800 million Reichsmark to Germany. Harris (1935, p.7) notes a jump in foreign short-term capital from 100 million in 1926 to 1,800 million in the boom year of 1927. This money was in part

directed into the Berlin stock exchange which saw its index soaring in the first four months of the year. Funds were channeled to the stock market by the large Berlin banks extending their credit lines with American banks in order to re-lend the money for a sizable profit to German stock market speculators. Or alternatively, foreigners invested directly in German stocks.

At the same time several indicators showed a marked rise in prices from the trough in mid-1926. The domestic boom also led to sizable monthly current account deficits of 200-400 million Reichsmark adding up to over 4 billion for the year (Institut für Konjunkturforschung, 1936, p. 90). Since foreign capital inflows were not sufficient to cover the deficits on the current account the Reichsbank started losing 500 million Reichsmark in reserves between January and June 1927 amounting to 21 percent of total reserves.

Schacht realized in the spring of 1927 that his attempt to manage foreign capital inflows and regain control over the money supply had failed. Banks, in particular the Berlin commercial banks, could easily circumvent the crippled foreign bond market (due to the abolition of the tax advantages) and draw on their short-term credit with foreign banks. Even worse, this meant an increasing short-term nature of foreign liabilities in the banks' balance sheets increasing the banking system's fragility. The whole bill came due in 1930 when political uncertainty increased country risk after the Nazi success in the September elections and wholesale capital flight ensued (Block, 2000b).

The above episode shows the difficulty of controlling money markets in the aftermath of hyperinflation without upsetting shallow capital markets, which continue to be dependent on foreign capital. A low interest rate policy thus has a twofold problem. On the one hand, booming demand leads to rising prices and an appreciation of the real exchange rate. The boom is accompanied by current account deficits, which will eat into reserves if foreign capital is not forthcoming (also remember the above mentioned legal reserve requirements

imposed in the Reichsbank Law). On the other hand, German capital markets were still unable to provide the long-term finance for public or private investment spending.

This episode shows that the high growth rate of 1927 was not sustainable. The financial market was unable to sustain the expansion without the infusion of increasingly short-term capital inflows and interest rates quickly edged up from their post-stabilization lows. In addition, inflation quickly accelerated and the current account deficit rose to over 4 percent of GDP. This episode casts doubt on the claim put forth by some of Borchardt's critiques (Holtfrerich, 1984; Voth, 1995) that a more expansionary monetary policy would have been a sustainable solution to the problem of stagnating investment. It is difficult to imagine that the Reichsbank could have succeeded in pursuing a monetary policy that would have balanced internal constraints of shallow capital markets and inflation fears with maintaining a sustainable current account deficit.

##### 5. Present and Past: What are the lessons?

The crisis and economic collapse of the Weimar Republic has continued to generate controversy over the last 60 years. Historical events as well as new developments in economic theory have frequently shed new light on the debate. The objective of this paper was to respond to the ongoing Borchardt debate by learning lessons from the recent experience of some Latin American countries. Borchardt's profit squeeze hypothesis was re-interpreted as a result of the very success of inflation-stopping exchange-rate-based stabilization programs. The real appreciation of the currency causes a profit squeeze in the tradables sector of the economy thereby causing stagnation, low savings rates and large current account deficits. It is in this sense that ERBS programs "sow the seeds of their own destruction."

In concluding this paper will use the arguments outlined above to take a closer look at the policy options in the early 1930s as well as provide an evaluation of the current Latin American situation. Borchardt had argued that deflationary policies were the only option left for Reichskanzler Brüning. Instead, his Keynesian opponents saw a promising alternative in expansionary fiscal and monetary policies accompanied by a withdrawal from the Gold Standard. The latter conclusion is indirectly corroborated by evidence that countries abandoning gold parity relatively early, like England, suffered from milder real losses during the depression compared to countries that stayed on gold. Britain's economic recovery after withdrawing from the EMS in 1992 and the revival of the Mexican and Brazilian economies after their devaluations in 1994 and 1999 seem to support the devaluation option. In contrast, Argentina is still mired in depression. Although Mexico went through a severe recession in 1995 it recovered surprisingly quickly from this setback. At the end of the 1990s Mexico's macroeconomic framework appears to be based on solid foundations. The domestic savings rate is now at just over 20 percent of GDP roughly 5 percent higher than during the crisis year. Foreign savings currently only contribute 3-4 percent of GDP compared to almost 8 percent in 1994.

However, a closer look at the recent Mexican success after ending its currency peg casts some doubt on the feasibility of this option for Germany. There are a number of factors that help to explain Mexico's swift recovery after the dramatic collapse. First and foremost, the sharp devaluation improved profitability in the tradable sector and sharply increased the competitiveness of Mexican goods. From a structuralist perspective it is this improved profitability that largely explains the markedly improved domestic savings rate. But there are other conjectural factors external to the Mexican economy that were instrumental in cushioning the extent and impact of the crisis. The rapidly U.S./IMF-administered rescue package successfully prevented a financial panic from turning into a long-term financial



meltdown in the aftermath of the 1980s debt crisis. Injections of foreign currency were needed because a sizable portion of foreign debt was denominated in dollars, like the infamous tesobonos. Secondly, the United States absorbed booming Mexican exports fueling an export-led recovery. Since 1994, roughly 80 percent of Mexican exports went to the United States. Consequently, the U.S. trade balance with Mexico quickly turned from a small surplus in 1994 to a \$15 billion deficit within a year. Mexico benefited from the NAFTA agreement as well as the long U.S. economic boom in the 1990s. Furthermore, foreign interest rates remained low and capital returned soon after the situation stabilized. This is not to say that the financial turmoil after the Asian, Russian and Brazilian didn't affect Mexico's external borrowing. But Mexico was in a much stronger position than in 1994 including a higher level of reserves, lower public sector debt payments and a higher share of foreign direct investment relative to portfolio investment to pay for current account deficits.

Unfortunately, none of these beneficial circumstances could be observed during the early 1930s. First, during the interwar period U.S. trade policy grew increasingly protectionist. Secondly, real interest rates in the United States remained very high during the depression and the following years and international lending was at a standstill. Thirdly, there was little international cooperation beyond the Hoover Moratorium to help Germany inject liquidity into its collapsing financial system.

Argentina's predicament is similar to the Weimar case in particular because the currency board, which pegs the peso at a 1:1 exchange rate with the U.S. dollar is still in place despite the apparent contradictions. But this relative stability was only achieved through continuous injections of IMF-administered foreign loans and debt re-scheduling programs especially after the frequent emerging market financial crises during the 1990s. In addition, currency stability comes at the cost of ongoing economic stagnation. Currently, the Argentine economy is suffering from a prolonged recession with high unemployment and

widespread de-industrialization. Based on this analysis the main problem lies in the fact that the Peso continues to be overvalued aggravated in recent years by the dollar appreciation and the devaluation of Argentina's main trading partner, Brazil. In addition, the foreign debt has ballooned to roughly 130 billion dollars. This precarious situation has most recently led to interest rate spreads on U.S. treasury bills of 10 percent. The implied high real interest rates will make it close to impossible for the Argentine government to control its debt level even though it has embarked on an ambitious program of fiscal spending cuts in 2001. Similarly, at these interest rates private investment activity will likely remain depressed. Furthermore, reductions in fiscal spending will only worsen the current depression much in the same way as the austerity measures implemented by the Brüning government did in the early 1930s.

This discussion suggests that decision makers should focus on the conditions for renewed growth instead of trying to eliminate fiscal deficits. A continuation of strict fiscal austerity à la Brüning will only cause further stagnation and economic crisis. Promoting growth is only possible by returning profitability to private sector activity through devaluation as in Mexico. But Argentina is not as closely integrated with the United States and its export sector is much smaller in comparison. Argentina's debt is to over 90 percent denominated in dollars so that devaluation will have a disastrous effect on the financial system. In July 2001 in anticipation of a default deposits are already withdrawn from the banking system at a rate similar to the aftermath of the Peso crisis. Furthermore, even though the IMF is still pouring in money to bolster the economy, the current U.S. administration is less likely to take an active stance to assist Argentina in case of a default as the Clinton administration did in association with the IMF during the Peso crisis.

The key lesson from the historical episodes is that inflation-stopping ERBS programs create other internal and external structural imbalances that require careful policy choices to avoid potentially disastrous economic collapses. A policy of rigid currency boards, fiscal

austerity and openness is not capable of returning economic prosperity. Exchange rate adjustments however need to be accompanied by international cooperation in finance and trade. While Mexico encountered a set of conditions conducive to renewed growth after a painful adjustment period, these conditions were not present in the interwar period and Argentina's current outlook is similarly bleak.

## NOTES

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<sup>1</sup> Since Hitler's takeover of power in 1933 is usually attributed to the impact of high unemployment and other economic dislocations caused by the Depression it is implicit in this argument that such a policy response could have prevented the following nightmare of fascism and war. This association is the reason behind the controversy and intensity associated with the Borchardt debate. These political repercussions will, however, not be pursued in this paper.

<sup>2</sup> Borchardt (1991, ch. 10) seems to lean towards this structuralist inflation story. He writes that "[U]ndoubtedly it was the considerable imports of capital which prevented many a conflict over distribution from manifesting itself so clearly in Germany; otherwise these conflicts would have emerged earlier."

<sup>3</sup> Even though price levels could be stabilized, inflation worries continued to characterize German capital markets throughout the 1920s and even during the deflationary period in the early 1930s (Borchardt, 1991).

<sup>4</sup> A number of figures illustrating the behavior of reserves and several macroeconomic variables have been omitted from this paper due to space constraints. They are collected in an unpublished appendix available upon request. For a more comprehensive presentation see also Block (2000a).

<sup>5</sup> See, for example, Blecker (1996), Dornbusch and Werner (1994), Chisari, Fanelli and Frenkel (1996).

<sup>6</sup> The current (July 2001) situation in Argentina, for example, is unbalanced. International investors demand interest spreads of more than 10 percent implying a real rate of interest of roughly 13-14 percent. At these rates the objective of jumpstarting the slumping economy to lower unemployment and stabilize debt levels will unlikely be achieved.

<sup>7</sup> There exists now a vast literature on the empirical regularities following exchange-rate-based stabilization programs. See, for example, Calvo and Vegh (1998), Rebelo and Vegh (1995), and Kiguel and Liviatan (1992). The Argentine plan is discussed in Fanelli and Frenkel (1998). Mexico's inflation stabilization is the subject of Dornbusch and Werner (1994), Dornbusch, Goldfajn and Valdes (1995), and Lustig and Ros (1998). A detailed graphical representation of these stylized facts collected in an unpublished appendix is available upon request.

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<sup>8</sup> Brazil also experienced real currency appreciation after the implementation of the Real plan in 1994. As in Mexico and Argentina the ERBS plan was successful in stopping hyperinflation but led to large current account deficits. Brazil's case is somewhat different because the government in response to the Peso crisis pursued a policy of extremely high interest rates which destabilized the banking system. Fiscal deficits quickly ensued because of government bail-outs of fragile banks. Palma (2000) provides a structuralist interpretation of the Brazilian experience with the Real plan. In January of 1999 Brazil had to abandon its currency peg in the aftermath of the Russian default and suffered a deep economic crisis. However, the economy has recovered quickly from the crisis because (i) the devaluation made Brazilian products competitive and (ii) inflation could be kept in check. However, the country now has to cope with a volatile exchange rate and still receives substantial help from the IMF in 2001. A detailed analysis of the Brazilian case is beyond the scope of this paper.

<sup>9</sup> Similarly, the policy discussion on Argentina's current options to escape stagnation and a possible default center entirely around the question of keeping fiscal expenditure in check. The problem however is that the extremely high real interest rates that the Argentine state has to pay make it very difficult to stabilize foreign debt levels even though the government has been running a primary surplus for some time. This discussion begs the question of how to propel the economy out of stagnation in the presence of the currency board since the structuralist interpretation suggests that stagnation is mainly the result of currency overvaluation.

<sup>10</sup> Ritschl (1990), Corbett (1991) and Borchardt (1989) present summaries of the computational issues raised in the controversy. Holtfrerich's criticism seems less relevant if one takes into account that the reductions in the work week were implemented for the most part immediately after the 1918 November revolution and not during the second half of the 1920s. I would like to thank an anonymous referee for pointing this out to me.

<sup>11</sup> Corbett (1991) further disaggregates unit labor costs for a number of industries and while finding a considerable amount of cross-industry variation confirms the overall rise.

<sup>12</sup> An alternative profit squeeze argument was put forth by German economist Adolph Lowe in the contemporary debates (see Hagemann, 1984). He argued that monopolies in particular in basic industries, like coal, kept prices artificially high and depressed profits in upstream industries. Instead of wage cuts he therefore recommended to expose these industries to the discipline of free trade or "Erziehungsfreihandel." Trade policy to discipline monopolies as an element of an industrial policy is certainly compatible with the structuralist interpretation put forth in this paper. But a general free trade policy in the presence of an overvalued exchange rate and liquid international financial markets is likely to lead to unsustainable current account deficits. The data also show that wholesale prices quickly stabilized after the Rentenmark reform and remained stable until deflation set in. It may be interesting to investigate monopoly prices in retail or real estate since prices in these sectors rose in the second half of the 1920s in Weimar Germany.

<sup>13</sup> Hentschel (1986) has computed indices of real effective exchange rates (REER) that allow us to further investigate Germany's loss of competitiveness. His data clearly show that Germany quickly lost its competitive edge after stabilization compared to France and the United States whose real exchange rates were indeed falling during the 1920s. In contrast, the competitive position of the United Kingdom was irreversibly damaged after WWI and its return to the Gold Standard in 1925 at prewar parity.

<sup>14</sup> It is now a well-established stylized fact that a firm's cash flow influences its investment activity. Bernanke and Gertler (1995) provide a survey of the evidence.

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<sup>15</sup> These computations are similar to Corbett (1991) who identifies 16 different industries to correlate profit rates with investment spending.

<sup>16</sup> Correlation coefficients for the profit-investment relationship for the 15 sectors were also computed. While there is evidence of sectoral variation average coefficients for the whole period and different sub-periods are between .55 and .65 supporting the positive relationship shown in figure 3.

<sup>17</sup> The lack of investment activity is also the main reason for high and rising levels of unemployment in the structuralist interpretation proposed here. Rather than focus on capacity constraints as the contemporary capital shortage argument (see Hagemann, 1984, p. 109) does structuralists emphasize the underutilization of capacity, i.e. a lack of effective demand as the main cause of unemployment in a short-run framework. In addition, the capital shortage argument seems to argue that investment in the Weimar Republic was constrained by the inability of the domestic capital markets to generate the necessary savings due to the destruction of money wealth after hyperinflation and due to the crowding-out effect of public borrowing needs. In contrast, a structuralist interpretation locates the problem of stagnation and unemployment in the inability of the business sector to generate profits sufficient to fund future investment as well as provide the incentive to undertake such investments.

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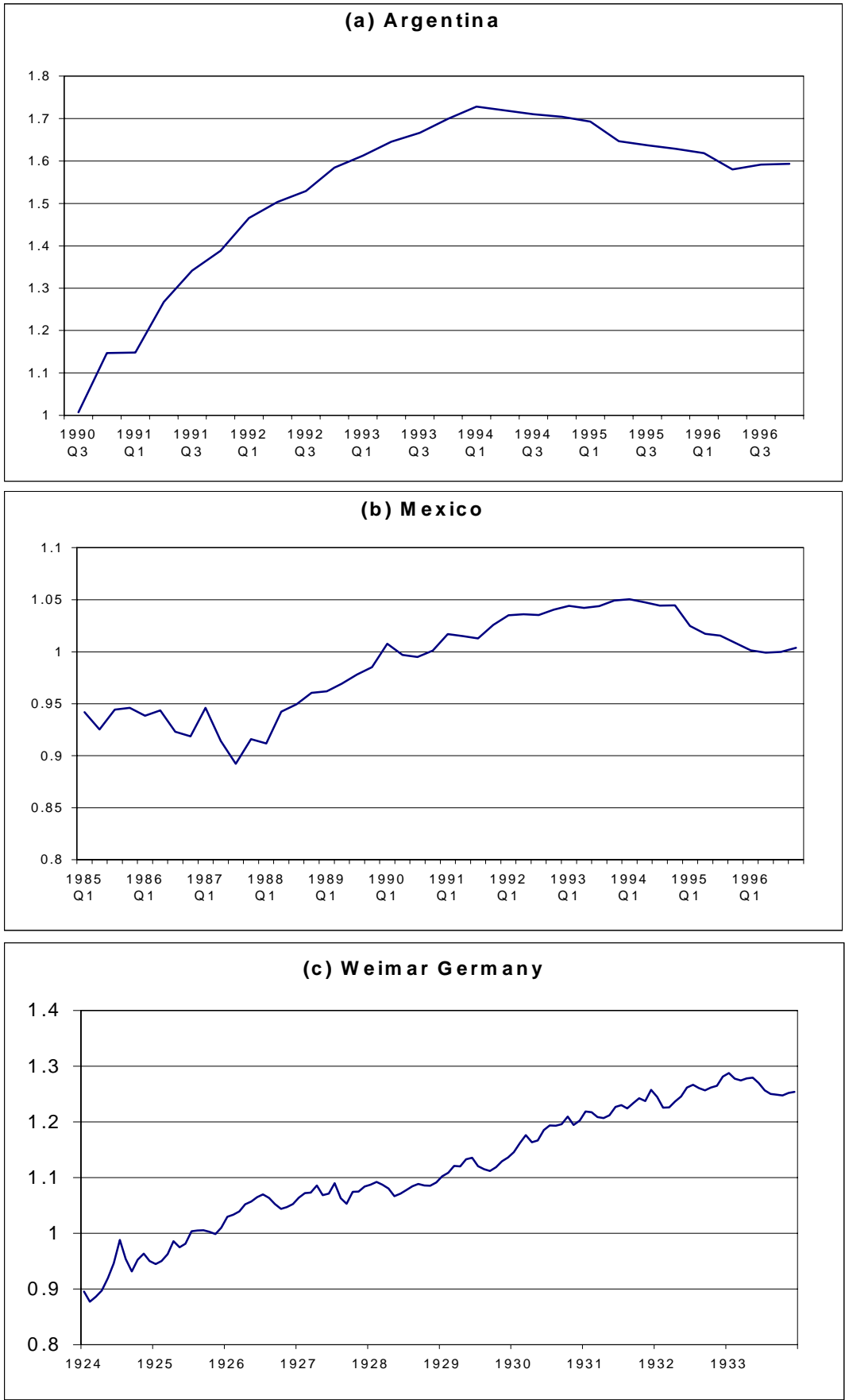
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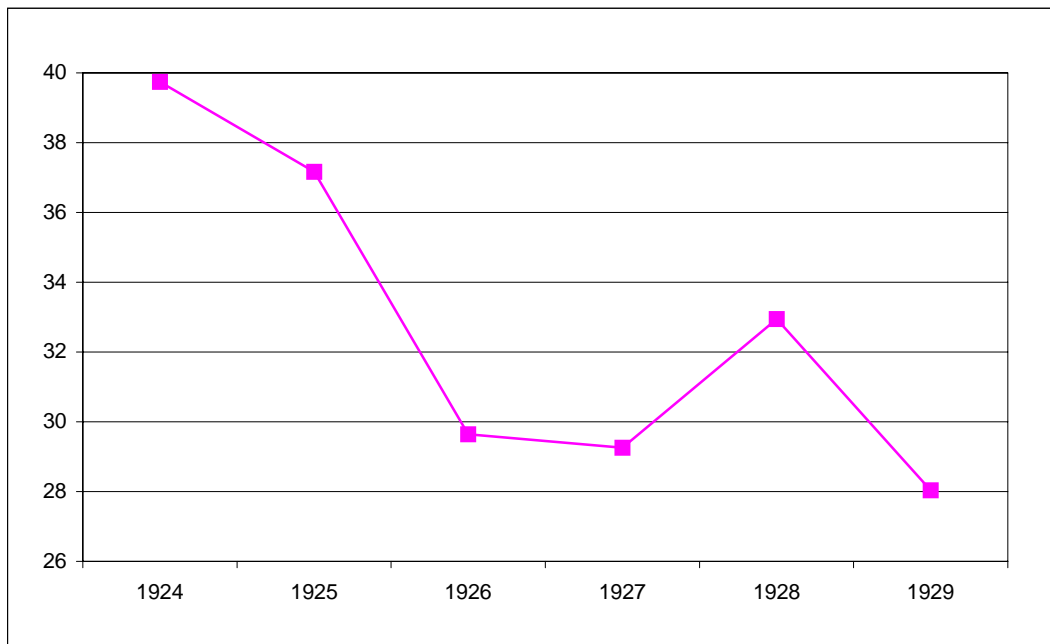
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**Figure 1: The relative price of non-tradable goods after ERBS (CPI/WPI)**



Notes: A consumer price index (CPI) is used as a proxy for non-tradable goods prices  
a wholesale price index (WPI) measures tradable goods prices.

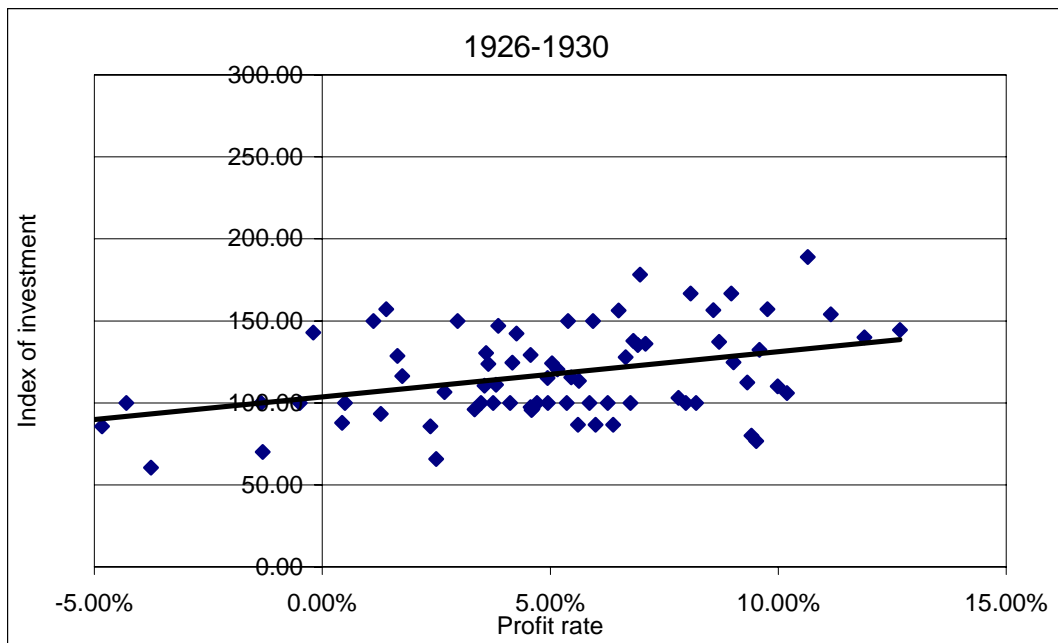
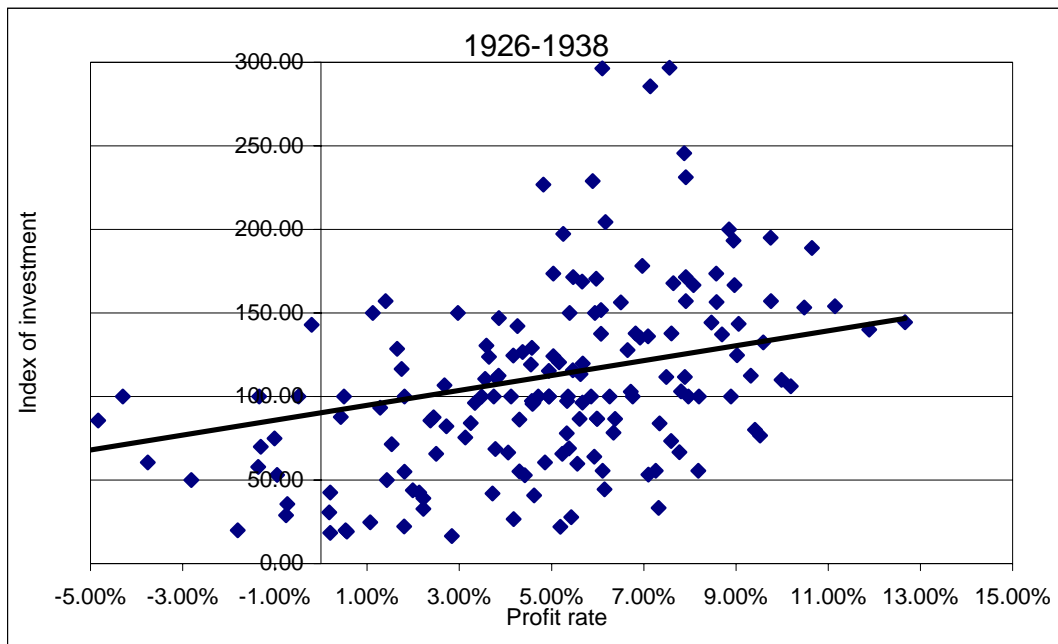
**Figure 2: The ratio of tradable to non-tradable investment in Germany**



Notes: Tradable sectors include industry and agriculture. Investment in the construction sector was subtracted from industrial investment based on disaggregated investment data for the industrial sector. Non-tradable investment incorporates all other sectors (utilities, transport, residential construction, public administration and others. "Other investment" was included because it largely measures investment in services like retail and wholesale trade.

Source: Statistisches Jahrbuch für das Deutsche Reich (1936).

**Figure 3: Investment and profitability in Weimar Germany**



Notes: Profit and investment data include 15 industries: mining, iron and metal extraction, chemicals, paper, building trades and materials, rubber and asbestos, leather, electrical, machinery and apparatus, textiles, clothing, foodstuffs, musical instruments, iron& steel&metal manufacturing and paper finishing.

Source: Profit data from Sweezy (1934-5); investment data from Statistisches Jahrbuch für das deutsche Reich (various years)

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