

EXPECTATIONS, CREDIBILITY AND EXCHANGE RATE DYNAMICS:  
THE CASE OF FRANCE 1922-1930

Luisa Lambertini

Università degli Studi di Bologna  
Dipartimento di Scienze Economiche

Agosto 1991

## INTRODUCTION

The behavior of French economy in the 1920s represents a very interesting episode, which attracted considerable analytical interest among the contemporaneous and, more recently, among economists and historians. The French economy after World War I was not surprisingly characterized by high inflation, large budget deficits and a growing National debt, which rudely shook the confidence on the franc. This gradual loss of confidence obviously led to financial and political instability, which reached their peak in the two speculative attacks against the franc in 1924 and 1926, and in the fact that eleven ministries came and went between those dates. It is extraordinary that this process bringing the economy to a three-digit annual rate of inflation suddenly reversed itself, bringing the economy and the French franc to a complete stabilization in an extremely short period of time.

Very few studies concentrated on the first half of the 1920s; much more attention, on the other hand, has been devoted to analyze the Poincare stabilization of 1926, and to understand the good performance of the French economy toward the end of the decade, when the onset of the Great Depression started to produce its effects on the rest of the world<sup>(1)</sup>. Among the former, several economists and historians have recently reexamined the episode and given different

---

(1) See, for example, Eichengreen and Wyplosz (1986).

interpretations. Yeager (1981), for example, emphasizes the role of fiscal policy and deficits in the French hyperinflation; Kindleberger (1984) instead interprets the events as a clear example of the destabilizing effects of expectations on the economy. Sargent (1984) analyzes the stabilization as the outcome of a credible change in regime; he emphasizes that a convincing change in regime can stabilize the economy very quickly. Makinen and Woodward (1989) argue that the key feature of Poincaré's stabilization lied in a change in the monetary regime supporting the debt management policy.

The purpose of this paper is to emphasize the role played by expectations in the behavior of the French economy from 1922 to the end of the decade; we also argue that expectations were largely rational and that their destabilizing effect was driven by destabilizing fundamentals.

The relatively fast convergence to a European Monetary Union stated in the Delors Report has recently renewed the interest in stabilization policies. Since the persistence of inflation differentials would have disruptive effects in a fixed exchange rate regime, European countries must get rid of inflation in a relatively short period of time. In this light the French experience of the 1920s might be a useful benchmark as to which theories best applied to this episode. Despite the large interest attracted by those episodes, very few works adopted an analytical approach; moreover, some

very interesting facts have received relatively little attention. For example:

- prices showed a high degree of volatility over the whole period and they adjusted particularly fast during the two major crises, showing no inertia at all; wages, on the other hand, seemed to be lagging behind prices;
- from July to December 1926 the spot franc continued to appreciate while it was systematically traded at a forward discount. This particular situation ended only in April 1927, four months after the spot franc had fully stabilized;
- the French economy went through a recession in 1926-27<sup>(2)</sup>.

A second purpose of this paper is to attempt a formal approach in the light of the economic performance of France in the 1920s. We believe that considering more carefully some of the unanswered questions may help us identifying the best models fitting that historical experience.

The paper is divided in two parts. The first presents an overview and an interpretation of the major economic developments in France in the period 1922-30; the second attempts a formalization of some aspects emphasized in the first part. The last and concluding section summarizes the key points and suggests the line of further extensions.

---

(2) This fact has been stressed by Eichengreen and Wyplosz (1986), who are more interested in the behavior of the French economy during 1928-31.

## SOME DEVELOPMENTS OF THE FRENCH ECONOMY IN 1922-30

### The post-war years.

The history of the French economy in the years 1922-30 can be divided into three main subperiods:

- from 1922 to mid-1926, a period characterized by high inflation and high volatility of the nominal exchange rate;
- the Poincaré's stabilization and the de facto stabilization of the franc at a fixed value and the 1927 recession;
- the period of renewed growth, which continued till the end of 1930.

In this section we will give a survey and an intuitive interpretation of the main economic events occurred in this period.

France had lapsed deplorably from the path of sound finance during World War I: up to November 1915, the war had been financed almost exclusively by external borrowing and the creation of floating debt which, on a considerable extent, took the form of advances from the Bank of France. Moreover, France came out to the war with terrible physical destruction; as a result, the expenditures were enormous in the first post-war years, thus creating an overall substantial budget deficit, as shown in Table 1. It should be stressed that a separate budget for the reconstruction

expenses was established, on the behalf that reparations from Germany should have covered later the main part of them. The deficit was mainly financed by issuing national defense bills, which were very short term instruments paying a fixed rate of interest; however, the gaps between expenditures and subscriptions were mainly filled by money creation, thus causing inflation. England and America had assumed the burden of pegging the French franc at a rate quite close to parity; however, the problem of inflation brought pegging to an end in March 1919. During the exchange rate panic in February 1920, the franc performed relatively well with respect to other currencies<sup>(3)</sup>; after the panic, the franc was traded at a forward discount in relation to the pound up to mid 1921.

Prices fell from their peak in 1920 quite fast, to stress that private agents were confident about the recovery of the nation.

Data about the growth in income and industrial production are shown in Table 2. They suggest that for most of the post-war period the French economy performed particularly well; by 1923, national income caught up the pre-war level. Some real effort was made to improve the budget situation: the imposition of new taxation in 1921 reduced the deficit substantially, both in real and nominal terms; internal government debt also declined as a percentage of NNP. However, any drastic measure to eliminate

---

(3) The 1920 panic was mainly caused by markets' realization that the pre-war parities could have never been restored, at least in a short period of time.

the debt problem had not been undertaken by 1924, and any decision to improve the budget situation through increased taxes usually found very strong resistance among the population. In addition to that, two factors had an important effect on the public opinion:

- it became increasingly clear that France would not have recovered the expected reparations from Germany. In January 1923, after Germany was officially accused of default, the Ruhr was occupied; as a result, the economic situation in Germany worsened and the mark started collapsing with growing rapidity. It was then understood that most of the French debt should have been paid by the French.

- In January 1924 a long term loan issued by the Credit National failed to gather the expected subscriptions<sup>(4)</sup>.

These factors made clear that, in the absence of moves to raise taxes, the debt would have eventually been monetized, thus generating inflation. As first suggested by Sargent and Wallace (1981), without any restrictive fiscal measure and under certain assumptions<sup>(5)</sup>, "tight money today can mean higher inflation eventually". But if the demand for money depends on the expected rate of inflation, then the current price level depends on the stream of current and expected future levels of money supply. As a result, current anticipations of high rates of money creation in the future

---

(4) This latter factor was not only an important signal of the difficulty in renewing matured issues, but also an effect of the distrust. It is well known that a fear of repudiation is potentially self-fulfilling.

(5) Namely, that the constant real return on bonds exceeds the common constant growth rate for real income and population, and that the demand function for base money exhibits constant income velocity.

tend to raise the current rate of inflation. The mechanism through which this takes place is simply the current monetization of the debt as a result of the difficulty in renewing it, as the French crises in 1924 and 1926 clearly showed. In this light, the speculative attacks were completely rational and they simply reflected the destabilizing features of the underlying monetary and fiscal regime<sup>(6)</sup>.

The behavior of prices and the exchange rate reflected public's gradual loss of confidence. After the 1920 panic the spot franc recovered quickly; in April 1922 the franc-pound rate was at 47.40; from then on it depreciated almost continuously and it reached 88.30 in the early 1924 (see Fig. 1). The forward franc had a very similar behavior: while in the 1920 and early 1921 it was at a premium in relation to the pound, the premium gradually disappeared and gave way to a discount in July 1921. In the following period the forward franc remained at a moderate discount (see Fig. 2). Fig. 3 shows that prices behavior mimicked very closely that of the exchange rate.

This climate of increased nervousness and loss of confidence in a fundamental recovery of the economy rapidly degenerated in a great speculative attack on the franc. The spot franc-sterling depreciated from 103.4 on March 1 to 117 francs on March 8. Whereas in other occasions the forward discount had contracted in anticipation of a recovery, this

---

(6) We should probably be more precise about the role played by the rate of return on bonds; we discuss this problem later, in relation to the speculative attack of 1926.



time the discount continued to widen, loosing contact with the interest parity. In response to the speculative attack, the Prime Minister Poincare obtained the imposition of a new tax, the double decime, and at the same time he had recourse to credit from abroad. At the same time the French government was granted a credit of 4 million pounds and 100 million dollars, which were promptly used to buy francs. Speculators' anticipations that these credits would be exhausted soon made the discount remain wide for some days. Despite the remarkable recovery which followed Poincare's bear squeeze, the spot franc began to depreciate again and the forward franc remained substantially undervalued through the 1925.

The bear squeeze then represented nothing more than a short-lived victory: in the absence of a genuine move to a different debt management policy, inflation was bound to continue. Agents' anticipation of future higher money growth rates were reflected in current inflation, the forward discount and the depreciating trend of the spot franc. It should also be noted that the period between June 1924 and July 1926 was one of political instability. After M. Poincare was defeated at the political elections in May 1924, a new government by the left-of-center Cartel des Gauches went to power, starting a period characterized by frequent changes in the government(7).

It is surprising that, notwithstanding the instability

---

(7) More precisely, between May 1924 and June 1926 France had seven premiers and nine ministers of finance.

of the period, the French economy did not enter any recession. In 1925 the rate of growth of real national income slowed down substantially and the Industrial Production index actually fell; as Fig. 4 and Table 4 show, the performance of the French economy had an export-based explanation up to 1926.

### **The speculative attack of 1926 and the Poincaré's stabilization**

In Spring 1926 the franc showed again signs of collapse and the rate of inflation started to accelerate, reaching a peak in July 1926. The franc-sterling spot rate reached 201 in July and the discount of the forward franc widened spectacularly; the annualized rate of inflation in June and July was 136 and 346 respectively. In the previous literature, three possible explanations have been given for the French hyperinflation. Sargent (1984) and Yeager (1981) attribute the episode to large and continuing budget deficits financed by money creation. However, there is little evidence that this is the case. The French deficit was shrinking very fast and, after 1924, it was not a problem; in fact, it gave way to a surplus in 1926. Moreover, there was not a clear relationship between the supply of notes and the deficits

Other authors<sup>(8)</sup> have emphasized the role played by the

---

(8) For example, Kindleberger (1984), Brown (1940) and Prati (1989).

loss of confidence in the eventual redemption of the debt. The factors usually mentioned as responsible for the run are the fiscal problem, the reparations question, the realization that the pre-war parity of the franc would have never been obtained again and the political instability. These reasons have surely played a role in determining expectations, not to mention the fact that a fear of repudiation can make itself rational even without any good reason to start it. Nevertheless, Makinen and Woodward (1989) claim that the loss of confidence hypothesis does not fit the timing of inflation or the behavior of other economic variables. The deficit was shrinking not only on absolute value, but also as a percentage of National Income; in addition to that, the debt growth came eventually to a halt exactly in the 1925-26. Makinen and Woodward then wonder why a loss of confidence did not occur earlier; they also argue that other crisis of confidence explanations, like the perception that Germany would not have paid the expected reparations, should not necessarily imply a runoff of the bonds. Even in the case that Ricardian equivalence had held, net government's bonds present discounted value would have been zero because of the fully offsetting tax liabilities.

Although none of these reasons could have caused alone the runoff of 1926, we believe that, altogether, they may have undermined private agents' willingness to hold bonds. Makinen and Woodward seem not to take into account that a

first loss of confidence determined the 1924 crisis, and that for the period 1925-26 the Bank of France had been evading the laws which limited the advances to the State and the note issue. The political turnover of that period and the absence of any convincing step toward a solution of the debt problem renewed the inflationary expectations which had first shown up two years before.

Makinen and Woodward (1989) support a monetary explanation of the French inflation. They claim that the French government was actually adopting a policy of interest pegging, thus refusing to offer the price at which the market would have held the debt<sup>(9)</sup>. But a policy of targeting interest rates inevitably causes monetary policy to become endogenous. Once the natural rate of interest exceeded the offered one, economic agents tried to get rid of bonds and the Bank of France had to advance notes to the State to fill the void.

A closer analysis of the monetary explanation raises two questions. First, if the discrepancy between natural and offered interest rate is the critical variable, then we should be able to identify the reason which drove up the natural rate in 1926. But Makinen and Woodward fail to produce any convincing reason for this, except for the fact that holders might have adaptively learned the inflation consequences of the French commitment to peg interest rates. Second, it would be interesting to test the monetary

---

(9) In the case of loss of confidence, on the other hand, the public does not hold government securities at any price.

hypothesis; however, the data contained in table 3 do not seem to give a clear-cut answer. On one side, the data seem to support the hypothesis that the interest rates were pegged, as demonstrated by the fact that the nominal interest rate did not rise substantially even during the speculative attacks. In addition to that, from 1922 to 1926 the real interest rate was negative and it reached -18.9 in the last year<sup>(10)</sup>. On the other side, both inflation and the real interest rate were extremely volatile in the period under consideration, thereby making it difficult to isolate a single breaking point. Moreover, we should be able to explain why a speculative attack did not take place either in 1920 or in 1923, when the real interest rate fell even further down than the 1926 level.

In July 1926 Poincare took charge again. The first steps were to deal with the crisis at hand and with the floating debt. Having learnt his lesson in 1924, Poincare made use of official interventions to stabilize the spot exchange rate and set about improving the debt management policy. The principal items were a further heavy addition to the tax burden and the creation of a Caisse Autonome d'Amortissement<sup>(11)</sup>, whose purpose was to refund the very short-term debt with longer maturities. Economic agents perceived Poincare's program as a genuine regime change and

---

(10) This raises also some questions about the validity of the Sargent and Wallace-type argument in the period 1923-26, given that a negative real interest rate should not exacerbate the inflationary consequences of the debt.

(11) The Caisse Autonome d'Amortissement was created by the solemn procedure of a constitutional amendment.

market expectations began to reflect this switch quite soon. Thanks to official interventions, the spot rate recovered quite quickly and stabilized at 121.06 by December. Obviously, the adjustment of expectations was a gradual process, even if a relatively fast one, which reinforced itself as the financial situation continued to improve<sup>(12)</sup>. As intuition would suggest, it is very likely that Poincare's return to power brought a first revival of confidence due to Poincare's reputation of austerity and efficiency. Nevertheless, the completion of the adjustment did not take place instantaneously. The market was not sure whether the monetary regime had changed and learned about it as new observations became available. The existence of 'learning processes' is usually associated with empirical phenomena which resemble a 'peso problem' in macroeconomic variables. The market seems to rationally make on-average mistaken forecasts. During Poincare's stabilization, for example, the forward franc was traded at a discount up to April 1927, while the spot franc continued to appreciate and then stabilized<sup>(13)</sup>. Intuitively, to the extent that the market thought debt management policy might not have changed, it predicted larger future money supply. Therefore it anticipated a depreciation on average, which was reflected in a forward discount. However, the policy

---

(12) Once again the self-fulfilling argument applies: a revival of confidence may cause a short run improvement in sole economic variable, even without any effective regime change. However, in the long run fundamentals are bound to prevail.

(13) This phenomena have also appeared more recently: for example, from 1981 to 1982 the US dollar followed a behavior qualitatively similar to that we described for the franc.

actually switched to tighter money supply, so that the spot rate followed an appreciating trend<sup>(14)</sup>.

Prices adjusted very quickly and stabilized by the end of 1926; it is interesting to note that they showed a very high degree of flexibility, whereas in the preceding period (except for the 1924 crisis), domestic prices seemed to lag behind the exchange rate. This empirical result suggests that a model assuming price stickiness might approximate quite well prices behavior in France after World War I, except at times when major changes in current or future monetary regime took place. Intuitively, it is precisely in these circumstances that we expect the timing of changes in prices not to be independent across firms. Money wages, on the other hand, lagged behind prices in the entire period, supporting the view that contracts were in some way staggered.

### **The 1927 Recession and the Renewed Growth**

Notwithstanding the quick stabilization of prices and exchange rate, the French economy went through a recession in 1927. Unemployment suddenly rose from 3% to 11% and the growth of real income fell to -3.5%. As many authors have already emphasized, this recession can be explained in terms of the fall in competitiveness due to the exchange rate appreciation, which in turn caused a decline to the volume

---

(14) A short, formal approach to this problem is taken in the second section.

of exports. However, a closer look at the data suggests that investment rather than exports was the principal cause of the output fall (see table 4 and 6). The explanation of this rests on the behavior of the real interest rate. Inflation fell very rapidly in 1926 and it gave way to deflation in 1927; on the other hand nominal interest rates remained high until March 1927 because of the 'learning' effect on the forward franc dynamics. As a result, the real interest rose, strongly discouraging investment. Therefore, the French recession of 1927 was the result of a different timing in the stabilization of prices and the forward exchange rate; the reason why the former stabilized faster than the latter is not clear.

The 1928-30 was a period of renewed growth for the French economy: unemployment fell from 11% in 1927 to 4% and 1% in the 1928 and 1929, respectively. The conventional view is that stabilization of the French franc at an undervalued rate after 1926 and elimination of inflation lowered nominal interest rates which, in turn, increased the demand for money. Under a Gold Standard regime<sup>(15)</sup>, an increase in money supply can only be obtained via a balance of payments surplus. Hence, in the conventional view the French expansion of the end of the decade was led by increasing exports. Eichengreen and Wyplosz (1986) find little evidence in support of this view; they also show that investment,

---

(15) Actually, French was on a de-facto Gold Standard from early in 1927 to June 1928, where the New Monetary Law officially equated the franc to 65.5 milligrams of gold, 900 fine. It was 0.20305 of the pre-war gold franc, and it implied a parity of 124.1 with London and 3.3179 cents to a franc with New York.



once again, emerged as the leading source of output growth. The share of investment in GNP rises from 14% in 1927 to nearly 21% in 1930. On the other hand, exports and current account surpluses tend to shrink both in absolute value and as a share of GNP. As further support of the hypothesis of a change in the composition of aggregate demand after 1926, Eichengreen and Wyplosz find evidence of a fall in the relative price of traded goods in relation to nontraded goods.

A plausible explanation for the rise in investment is the fall in real interest rate following the complete stabilization of the franc. Starting at the end of 1926, nominal interest rates could fall in accordance with the gradual shrinking of the forward discount; since inflation was already stabilized, the real interest rate followed the nominal interest rate behavior very closely<sup>(16)</sup>.

The fall in the volume of exports is consistent with the appreciating trend of the real exchange rate between 1927 and 1930; moreover, it is plausible to assume that aggregate demand in the other countries contracted after 1929 because of the first effects of the Great Depression.

These reasons can explain the shift in demand from the traded goods to the nontraded goods sector; since unemployment was very low, this shift in demand partially translated into prices, thus causing a fall in the ratio of

---

(16) Eichengreen and Wyplosz (1986) give a more elaborate, but I hope not incompatible, explanation to the surge of investment: they show the existence of a link between fiscal policy, Tobin's  $q$  and the real exchange rate whose effects are consistent with the developments of the French economy toward the end of the 1920s.

the two goods.

### A TALE OF TWO MODELS

The analysis of the major developments of the French economy in 1922-1930 has given us three interesting indications:

- at times where a monetary regime is changing, prices tended to be fully flexible. Intuitively, a change in the monetary policy represents an aggregate shock to which firms tend to response contemporaneously, i.e. there is high correlation in the timing of price changes across firms;
- in periods of minor changes in expectations, where idiosyncratic shocks were preminent, prices tended to be sticky;
- wages always lagged behind prices.

Therefore, an attempt to undertake a more formal approach needs two different kinds of models. A simple monetary model which assumes full price flexibility might fit the first scenario; on the other hand, a dynamic model which assumes price or wage staggering might fit better the second one.

### A Simple monetary model

The monetary approach to the exchange rate determination rests on two basic assumptions:

- 1) domestic and foreign bonds are perfect substitutes
- 2) domestic and foreign goods are also perfect substitutes, i.e. PPP holds at any time.

The basic equations of the monetary approach are conventional money demand functions

$$(1) \quad m = p + ay - bi$$

$$(2) \quad m^* = p^* + ay^* - bi^*$$

where :  $m$  = log of domestic money supply  
 $p$  = log of domestic price level  
 $y$  = log of domestic real income  
 $i$  = domestic interest rate

An asterisk denotes variables for the foreign country.

Taking the difference of (1) and (2) we obtain

$$(3) \quad m - m^* = (p - p^*) + a(y - y^*) - b(i - i^*)$$

Uncovered interest parity implies that

$$(4) \quad i - i^* = Ede$$

where  $Ede$  = expected change in the spot exchange rate. PPP implies that

$$(5) \quad e = p - p^* \quad \text{and} \quad Ede = Edp - Edp^*$$

Substituting (4) and (5) into (3) we obtain

$$(6) \quad e = (m - m^*) - a(y - y^*) + bEde$$

where  $b$  is the semi-elasticity of domestic money demand with respect to the interest rate. To keep things simple we can normalize with respect to the foreign country variables, so that we simply obtain

$$(7) \quad e_t = m_t - ay_t + bE_t de$$

Solving equation (7) forward under the assumption that output follows a stationary process, the current exchange rates depends upon the present value of the expected future

path of the forcing variables, including the expected future money supplies

$$(8) \quad e_t = (1-c) \sum_{j=0}^{\infty} c^j [-aE_t Y_{t+j} + E_t m_{t+j}] \quad c = b/1-b$$

Equation (8) shows how a bad debt management policy bound to cause future monetization affects the current nominal exchange rate (and, via PPP, the current price level).

This model can also explain the puzzling phenomenon of the coexistence of a forward discount and an appreciating spot rate<sup>(1)</sup>. Assume, for example, that the money supply process is noisy and equal to

$$(9) \quad m_t = d_0 + v_t$$

where  $d_0$  is a constant and  $v_t$  is a iid normally distributed random variable with zero mean and variance  $\sigma_0$ . Suppose that, at  $t=0$ , the monetary regime shifts to a tighter one like

$$(10) \quad m_t = d_1 + u_t \quad \text{for } t \geq 0$$

where  $d_1 < d_0$ . For simplicity we assume that  $d_1 = 0$ ,  $d_0 > 0$ . However, the market is uncertain whether the regime has actually changed. Given a prior  $P_{1,t}$ , which is the probability assigned by the market to the event that the process has changed,

$$(11) \quad E_t m_{t+j} = d_0(1 - P_{1,t}) \quad j > 0, t \geq 0$$

Substituting (11) into (10)

$$(12) \quad e_t = (1-c) \sum_{j=0}^{\infty} c^j a E_t Y_{t+j} + c(1 - P_{1,t}) d_0 + (1-c) m_t$$

The spot exchange rate is a weighted average of the current money supply  $m_t$  and expected future  $m$ .

(1) See Lewis (1987).

As new observations become available, economic agents optimally update their prior beliefs according to Bayes' Rule. As intuition would suggest, in any given period of time the expected path of the 'true process' probabilities rises approaching one. Assume now that the forward rate equals the expected future spot exchange rate, so that the forward discount is simply equal to  $E_d e_t$ . In order to concentrate on the learning effect, assume that the unconditional expected change in income is zero. Leading (12) one period ahead, taking conditional expectations and subtracting  $e_t$  we obtain the forward discount

$$(13) \quad E_t e_{t+1} - e_t = -(1-c)u_t + (1-c)(1-P_{1,t})d_0$$

the expected value of the sample mean of the forward discount is positive

$$(14) \quad (1/T)E\left\{\sum_{t=1}^T (E_t e_{t+1} - e_t)\right\} = (1-c)\left\{\sum_{t=1}^T (1-P_{1,t})d_1\right\}d_0/T > 0$$

The market anticipates depreciation to the extent that policy is perceived not to have changed. On the other hand, the spot exchange rate depends on the actual policy in play. Leading (12) one period ahead and subtracting  $e_t$  we obtain

$$(15) \quad (1/T)E\left\{\sum_{t=1}^T (e_{t+1} - e_t)\right\} = -E\left\{\sum_{t=1}^T (P_{1,t+1} - P_{1,t})d_1\right\}cd_0/T < 0$$

#### A "Sticky price" model

As explained earlier, a model which assumes price or wage stickiness would probably fit the data better if we want to analyze the first half of the 1920s (excluding the speculative attack of 1924). As Sauvy (1984) suggests, price

stickiness and the fact that exchange rate depreciations were mainly unanticipated in the period 1922-1926 were the main reasons of the depreciating trend followed by the real exchange rate. This, in turn, explains the increase in the volume of exports up to 1926.

A simple overshooting-type model à la Dornbusch (1976) might be used as a first approximation. The overshooting model simply relaxes the assumption that goods are perfect substitutes, and it assumes instead that PPP holds only in the long run. The final equation for the exchange rate in the overshooting model is

$$(16) \quad e = (m - m^*) - a(y - y^*) - (i - i^*)/g$$

where  $g$  is the speed of adjustment of the exchange rate<sup>(18)</sup>. Monetary shocks have real short run effects in this model because the slow adjustment of prices affects the real exchange rate and real money balances.

More sophisticated models which introduce staggered wage or price contracts, like Taylor (1979), Fischer (1977), and Calvo (1982), might also be used.

## CONCLUSIONS

During post World War I period the behaviour of the franc reflected the underlying fundamentals and the credibility of government's stabilization policies. In the post-war years, franc depreciation and its forward discount

<sup>18</sup> Since prices do not adjust instantaneously, the overshooting model reduces to a system of two differential equations whose solution is a saddlepoint.

clearly signalled that the return to the Gold Standard was not perceived as credible by the market. Large budget deficits before and the absence of drastic measures to solve the debt problem later made agents rationally forecast higher rates of future inflation which, in turn, raised the current price level. A policy of interest rate pegging (as the data seem to support) made current money endogenous, so that losses of confidence had direct inflationary consequences. Hence, the two speculative attacks of 1924 and 1926 were mainly driven by destabilizing fundamentals and, notwithstanding the destabilizing consequences, expectations were rational even in those circumstances. This was confirmed by the fact that both the exchange rate and prices stabilized fast once the stabilization policy became credible.

The absence of inertia in price movements at times where the monetary regime is perceived to have changed suggests that a simple monetary model might fit the French experience during the Poincare stabilization. On the other hand, a model which assumes price or wage stickiness might fit the rest of the sample, where prices seemed to lag behind the exchange rate.

## REFERENCES

- Brown, W.A. (1940) - The International Gold Standard Reinterpreted - New York: National Bureau of Economic Research.
- Calvo, G. A. (1982) - Staggered Contracts and Exchange Rate Policy - in J.A. Frenkel, ed. Exchange Rates and International Macroeconomics - University of Chicago Press.
- Calvo, G.A. (1983) - Staggered Prices in a Utility Maximizing Framework - Journal of Monetary Economics, 12.
- Eichengreen, B. and Wyplosz, C. (1986) - The Economic Consequences of the Franc Poincare - NBER Working Paper n.2064.
- Einzig, P. (1937) - The Theory of Forward Exchange - Macmillan.
- Galenson, W. and Zellner, A. (1957) - International Comparisons of Unemployment Rates - in NBER, The Measurement and Behaviour of Unemployment, Princeton: Princeton University Press.
- Hawtrey, R. G. (1962) The Art of Central Banking Frank Cass & CO.Ltd.
- Kemp, T. (1971) - The French Economy under the Franc Poincare - Economic History Review.
- Lewis, K.K. (1988) - The Persistence of the 'Peso Problem' when Policy is Noisy - Journal of International Money and Finance, 7.
- Makinen, G.E. and Woodward, G.T. (1989) - A Monetary Interpretation of the Poincare Stabilization of 1926 - Southern Economic Journal.
- Prati, A. (1988) - Poincare Stabilization: Stopping a Self-Fulfilling Debt Run - University of California Los Angeles, mimeo.
- Saint-Etienne, C. (1983) - L'Offre et la Demande de Monnaie dans la France de l'Entre-Deux-Guerres (1920-1939) - Revue Economique, 34.
- Sargent, T. J. (1984) - Stopping Moderate Inflation: The Methods of Poincare and Thatcher - in Inflation, Debt and Indexation, edited by Dornbusch and Simonsen, Cambridge, MIT Press.



Sargent, T. J. and Wallace, N. (1981) - Some Unpleasant Monetarist Arithmetic - Federal Reserve Board of Minneapolis Quarterly Review.

Sauvy, A. (1984) Histoire Economique de la France entre les deux guerres, Paris: PUF.

Yeager, L.B. (1981) Experiences With Stopping Inflation, Washington D.C.: American Enterprise Institute.

TABLE 1

| Year | Deficits | Def/NI | Total Int.<br>Debt | Unemployment |
|------|----------|--------|--------------------|--------------|
| 1918 | 34.3     |        |                    |              |
| 1919 | 26.7     |        |                    |              |
| 1920 | 17.1     | 12.9%  | 219.2              | 5.0          |
| 1921 | 9.3      | 6.6    | 241.4              | 2.0          |
| 1922 | 9.8      | 6.7    | 254.4              | 2.0          |
| 1923 | 11.8     | 7.2    | 275.2              | 3.0          |
| 1924 | 7.1      | 4.4    | 285.5              | 3.0          |
| 1925 | 1.5      | 0.7    | 291.6              | 3.0          |
| 1926 | +1.1     | 0.4    | 291.9              | 11.0         |
| 1927 | +0.2     |        | 277.9              | 4.0          |
| 1928 | +3.9     |        | 288.6              | 1.0          |
| 1929 | +4.9     |        | 279.8              | 2.0          |
| 1930 | 4.9      |        | 283.0              |              |

TABLE 2

| Year | Real National<br>Income | Growth in RNI | Industrial<br>Production | Unemployment |
|------|-------------------------|---------------|--------------------------|--------------|
| 1920 | 270                     |               | 65.5                     |              |
| 1921 | 250                     | 7.4%          | 54.4                     | 5.0%         |
| 1922 | 304                     | 21.6          | 81.5                     | 2.0          |
| 1923 | 329                     | 8.2           | 91.7                     | 2.0          |
| 1924 | 381                     | 15.8          | 110.2                    | 3.0          |
| 1925 | 384                     | 0.8           | 109.0                    | 3.0          |
| 1926 | 401                     | 4.4           | 125.3                    | 3.0          |
| 1927 | 387                     | -3.5          | 109.6                    | 11.0         |
| 1928 | 410                     | 5.9           | 116.0                    | 4.0          |
| 1929 | 453                     | 10.5          | 128.0                    | 1.0          |

TABLE 3 (rates)

| Year | Nominal Int. | Inflation | Real Int. | Advances |
|------|--------------|-----------|-----------|----------|
| 1919 | 5.2          | 5.1       | 0.1       | 23.0     |
| 1920 | 5.8          | 43.0      | -37.2     | 29.8     |
| 1921 | 6.1          | -32.2     | 38.3      | 29.6     |
| 1922 | 5.7          | -5.3      | 11.0      | 27.4     |
| 1923 | 6.0          | 28.0      | -22.0     | 27.7     |
| 1924 | 7.0          | 16.7      | -9.7      | 27.6     |
| 1925 | 9.1          | 12.6      | -3.5      | 31.5     |
| 1926 | 8.8          | 27.7      | -18.9     | 41.2     |
| 1927 | 6.6          | -12.1     | 18.7      | 33.1     |
| 1928 | 5.3          | 0.0       | 5.3       |          |
| 1929 | 4.9          | -1.4      | 6.3       |          |

TABLE 4  
Decomposition of National Income (as percentage of GNP)

| Year | Consumption | Investment | Government<br>Spending | Current<br>Account |
|------|-------------|------------|------------------------|--------------------|
| 1922 | .533        | .139       | .312                   | .016               |
| 1923 | .606        | .140       | .240                   | .014               |
| 1924 | .599        | .167       | .216                   | .019               |
| 1925 | .648        | .152       | .176                   | .023               |
| 1926 | .645        | .174       | .152                   | .029               |
| 1927 | .670        | .143       | .163                   | .023               |
| 1928 | .643        | .180       | .159                   | .017               |
| 1929 | .658        | .183       | .147                   | .013               |
| 1930 | .608        | .209       | .182                   | .001               |

TABLE 5

| Year | Exchange rate<br>spot Ff/pound | Price<br>(general index) |
|------|--------------------------------|--------------------------|
| 1920 | 52.7                           | 520                      |
| 1921 | 51.9                           | 352                      |
| 1922 | 54.5                           | 334                      |
| 1923 | 75.7                           | 428                      |
| 1924 | 85.3                           | 499                      |
| 1925 | 102.6                          | 561                      |
| 1926 | 152.7                          | 718                      |
| 1927 | 123.8                          | 630                      |
| 1928 | 124.0                          | 634                      |
| 1929 | 124.0                          | 623                      |
| 1930 | 123.7                          | 543                      |

| Month | Exchange rate<br>spot Ff/pound |       | Price Index |      |
|-------|--------------------------------|-------|-------------|------|
|       | 1926                           | 1927  | 1926        | 1927 |
| Jan   | 128.8                          | 122.6 | 647         | 635  |
| Feb   | 132.4                          | 123.6 | 649         | 645  |
| Mar   | 135.8                          | 124.0 | 645         | 655  |
| Apr   | 143.7                          | 124.0 | 664         | 650  |
| May   | 155.6                          | 124.0 | 702         | 642  |
| Jun   | 165.9                          | 124.0 | 754         | 636  |
| Jul   | 199.0                          | 124.0 | 854         | 636  |
| Aug   | 172.1                          | 124.0 | 785         | 631  |
| Sep   | 170.1                          | 124.0 | 804         | 613  |
| Oct   | 165.5                          | 124.0 | 768         | 600  |
| Nov   | 141.2                          | 124.0 | 698         | 607  |
| Dec   | 122.9                          | 124.0 | 640         | 617  |

FIG 1

