SOME NEGLECTED MONETARY ASPECTS OF THE POINCARÉ STABILIZATION OF 1926

by

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The stabilization of the French franc and economy in mid-1926 was so sudden and dramatic that it has come to be called the "Poincaré miracle" after the French premier, Raymond Poincaré, who brought it about. Recently, Professor Thomas Sargent has pointed to this experience to support the rational expectations view that even in a situation where, presumably, staggered fixed term nominal contracts exist, an economy with triple digit inflation can be stabilized quickly without the necessity for a prolonged period of high unemployment.[1] This can be achieved if economic agents become convinced that a regime change is at hand -- a change in the rules under which authorities conduct policy. In the French case, Sargent sees in Poincaré the essence of such a convincing change in fiscal regime.

Our purpose in this paper is not necessarily to disagree with Sargent. We argue, however, that in its fundamentals what Poincaré did was to alter immediately the nature of the <u>monetary</u> regime that was the source of the instability in the French economy during the 1920s. If one were to seek a historic parallel for what Poincaré did it would not be in the stabilizations that ended the big hyperinflations that Sargent and others have studied elsewhere.[2] Rather, it would be in the famous Accord worked out between the U.S. Treasury and the Federal Reserve in 1951. We are tempted to argue that given the fiscal regime in existence when Poincaré assumed power, the French version of the Accord would have been sufficient, in and of itself, to bring about stability.

In addition, we believe that the French experience with the inflation that preceded the stabilization also sheds light on the nature and significance of

expectations. We believe it provides evidence not only that expectations played a pivotal role in the stabilization, but that they were crucial to the development of the inflation, and, moreover, that these expectations were rational, not volatile and mercurial as most contemporary (and some recent) accounts suggest.

Our discussion is divided into four parts. The first presents a factual overview of economic developments in France up to the crisis in mid-1926. The second presents the major interpretations of these developments. In the third section we raise questions about these interpretations in light of the evidence. In part four we present our own interpretation. A concluding section follows.

I. MAJOR ECONOMIC DEVELOPMENTS IN FRANCE 1920-1926

Among the belligerent powers in World War I, France experienced the major amount of physical destruction. Its territory adjacent to Belgium was the major battleground for the war. After the Armistice, France expended considerable sums to restore the destruction. A separate budget was established for this purpose for which expenditures were covered by the actual receipt of reparations from Germany and by borrowing on the expectation that Germany would, in due course, pay the remainder. Since these expenditures were large, the overall French budget as shown on Table 1 was in substantial deficit -- for 1920 this deficit was equal to 43% of expenditures (and, almost 13% of net national product).[3] This represented, in many respects, a continuation of the fiscal policies pursued during the war, which France overwhelmingly financed by borrowing. Extensive use was made of very short term instruments issued in denominations ranging from 25 to 100,000 francs and in maturities from one month to one years.[4] These were the famous national defense bills (_bons de la defense nationale_) that were continuously on sale at fixed rates of interest. As shown on Table 2, the bills were a large proportion of the total internal debt of France. Periodically, the Treasury would float longer term issues. In the post-war era, these issues were

used primarily to raise funds for the restoration of the devastated regions.[5] All funds that could not be raised by these two means were covered primarily by advances from the Bank of France. A modicum of financial control was attempted by limiting the advances the Bank could make to the state, by placing a ceiling on the total note issue of the Bank, and by concluding a Convention under which the Treasury agreed to retire 2 billion francs of advances from the Bank per year for all years subsequent to 1920.[6]

In early 1925 a major scandal broke when it was learned that the government had induced the Bank of France to falsify its weekly statements to conceal the fact that it had advanced a larger sum to the state than allowed by law and that during the early months of 1925 its note issue had exceeded the statutory limit of 41.0 billion francs, established on September 28, 1920. The government's defense in this scandal was that it did nothing in spirit different from what had been common practice in earlier administrations. The Bank of France had previously advanced credit to private banks which used the proceeds to buy government securities. It then was able to list the advances as miscellaneous assets and circumvent the limit on advances to the government. In this instance the circuitous method had been abandoned in favor of making the advances directly and lying about them.[7] Three times during 1925 the statutory limit on advances to the state and the note issue ceiling had to be raised to allow the government to cover the excess of debt redemptions over renewals since 1925 was a year in which some 22 billion francs of longer term maturities came due in addition to the turnover of the short dated debt.[8]

While France experienced a short but sharp post war recession similar to the U.S. and U.K., the estimates of national income and industrial production shown in Table 3 suggest that for most of this period France had substantial real growth. By 1923 national income surpassed pre-war levels.

The behavior of internal prices and the exchange value of the franc were remarkably similar during most of this era. After official support of the value of the franc ended immediately after the war, it fell to a level consistent with the higher domestic price level and, thereafter, tracked movements in internal prices closely. As shown on Table 4, the deflation during 1921 was matched by an appreciation in the franc. The stable prices of 1922 are matched by a stable franc. The inflation of 1923 is paralleled by a comparable fall in the value of the franc as is the inflation of 1925-26.

Two separate episodes of inflation/depreciation during this period have attracted particular attention. The first started late in 1923 and ended in the first quarter of 1924. This was during the premiership of Raymond Poincaré who was later to achieve such fame as the savior of the franc. From September 1923 to February 1924 the franc fell from 6.2 cents to 3.8 cents (almost 40 percent). Poincaré got Parliament to raise taxes (the so-called double decime tax).[9] On the basis of the tax increase France also borrowed $100 million from Morgan and £4.0 million from Lazard-Freres. These funds were used to engineer a "bear squeeze" on those who had sold the franc short. For the remainder of 1924 the government intervened in the foreign exchange market to stabilize the franc. It was not until the second quarter of 1925 that the final onslaught against the franc started. Both the rate of inflation and the rate of depreciation began to accelerate, reaching a peak in July 1926. For May-June and June-July 1926, the annualized rate of inflation (measured by wholesale prices) was 136 and 346 percent respectively. Between May and July the dollar rose in Paris at a 490 percent annual rate.

In July 1926 the attack on the franc reached its height and on the 26th Poincaré was called again to be premier when no candidate from the parties of the left could command a majority. Poincaré's first acts were to deal with the crisis at hand. The unexpended portion of the Morgan loan of 1924 was used to stabilize

the exchange rate -- these operations continued through September. Second, an immediate loan of nearly a billion francs was arranged with private banks to provide the Treasury with an operating balance. In this instance, Poincaré was careful not to ask for a further increase in the advances the Bank might give to the government.

Very soon thereafter -- within a week -- Parliament agreed to a major increase in various tax rates that not only moved the budget into surplus but provided a considerable sum for a sinking fund whose purpose was to both retire and refund the very short term debt with longer maturities.[10] The provisions setting up the reorganization of the debt known as the _La Caisse autonome de gestation des bons de la defense nationale, d'exploitation industrielle des tabacs, et d'amortissement de la dette publique_ (known simply as the _Caisse d'amortissement_) and assigning to it various revenues were embodied in an amendment to the French constitution passed by the National Assembly meeting for the occasion at Versailles. These changes laid the groundwork for France to reestablish the gold standard in 1928.

II. PRIOR INTERPRETATIONS OF THIS ERA

In all accounts of the French inflation, both contemporary and recent, three themes are repeated: persistent deficits, a large debt of mostly short maturities, and a loss of public confidence. Both Sargent and Yeager present the situation as a classic one.[11] The budget was in deficit; the deficit was at least partly financed by money creation; inflation resulted; and stabilization was brought about when the deficits were eliminated and the pressure to create money reduced. As Sargent writes:

> "For some time there had been a broad consensus both about the principal economic factors that had caused the depreciation of the franc -- persistent government deficits and the consequent pressure to monetize government debt -- and the general features required to stabilize the franc -- increased taxes and reduced government expenditures sufficient to balance the budget, toget-

her with firm limits on the amount of government debt monetized by the Bank of France"[12]

Early observers were not as certain of the causes of the franc's decline as Sargent. Again and again, the debt -- more than the deficit -- is invoked as the problem. Moreover, public confidence in the government plays a great role in their account of the process of inflation. Hawtrey's assessment of the source of of the problem is probably best known:

"In a sense the special budget of recoverable expenses was the cause of the collapse of the franc. To meet it from revenue would have been an unpatriotic act, an expression of doubt as to the recovery of reparations in full from Germany. It was consecrated as a deficit in principle. The result was not only to involve the country in continuous borrowing which the investment market was at times unable to absorb, but also to tie up the prospects of the French franc with the prospects of the German mark in the minds of the public. Any event which threw doubt on Germany's capacity to pay reparations immediately had an adverse effect on the franc."[13]

This theme is echoed by others. Rogers writes:

"The fourth phase [of the inflation, 1925-26] immediately following, however, is clearly characterized by the waning confidence of the public in German reparations and with it the declining credit of the government.

The link of confidence to inflation lay in the government's ability to sell securities, he continues:

"... unable to meet payment of its rapidly maturing floating obligations in addition to the heavy demands upon it for current expenses, the Treasury was forced to borrow in ever increasing amounts from the Bank."[14]

Brown writes:

"The public was therefore in a position to force the government to borrow from the Bank of France if for any reason it was unwilling to renew the govenment's maturing debt. The defeat of M. Poincaré and his replacement as premier by M. Herriot, by increasing nervousness and distrust of financial interests in the economic policies of the government, did in fact lead to the exercise of this power."[15]

Wolfe tells us:

"The wealthier financial interests had sold the franc down the river in 1924. It had taken one more year for small investers, and the bulk of the French people, to realize that the attainment of pre-war parity for the franc was a hopeless dream. The 'flight from the franc' was an example of the self-frustrating response which follow a community's sudden comprehension of the consequences of a depreciating currency."[16]

To these observers, the solution was, thus, mostly one of restoring confidence. Dulles argued:

> "It is nontheless true that the rapid enactment of a consistent and vigorous program, almost regardless of its nature, would have saved the government from the continuing deficits and the distressing exchange crisis of 1925 and 1926. Since no such rapid action was possible, the public lost confidence in the government, in its securities, and its money."[17]

Nor was this emphasis on confidence limited to past observers. Kemp, for example, writes:

> "With this belief in mind [Germany will pay], the government allowed the debt to mount and became dependent on advances from the Bank of France and short term borrowing from the public. Its account thus became highly sensitive to public confidence, or rather to that section of the public which had monetary reserves and savings....
>
> "Stabilization succeeded, but it did so much more on the basis of a restoration of confidence by political legerdemain than by the discovery or application of new techniques of monetary and fiscal policy. The operation was simply and strictly one of restoring confidence in the ability of the government to meet its commitments."[18]

Sargent again:

> "With the collapse of the German mark during 1923 and relief from reparations under the Dawes plan in 1924, it became clear that France could not continue to expect that German reparations would be sufficient to redeem the French government's debt. From that time on the franc depreciated and the domestic price level rose."[19]

Finally, Yeager:

> "Political and psychological factors were also at work. Though actual government budget deficits and increases in the national debt remained moderate, ... they were large enough and had persisted long enough to sap confidence. The government kept having trouble selling new securities to pay off old ones when they became due, especially since so much of the debt was of short maturity. With the government having to borrow at the Bank of France, increases became necessary in the limits set for the Bank's advances to the state and to its note issue -- either for outright increases or devious subterfuges."[20]

Thus, while Sargent and Yeager emphasize the role of large deficits financed by money creation, they also countenance the intepretation of earlier observers that the fate of the franc was produced by the disillusionment of the French public -- a disillusionment that ultimately manifested itself increasingly in an unwillingness to hold government debt -- both interest and noninterest bearing.

Why did the French public become disillusioned?

Its origin was related to the method used by France to finance World War I and the post-war reconstruction. Since a defeated France had to pay an indemnity to Germany following the Franco-Prussian war, the French concluded that Germany should be accorded similar treatment. The Germans were to pay all of the costs for war damages including various pensions and interest cost related in part to the funds raised for reconstruction. The notion that "the Germans will pay" was put forth by an early Minister of Finance, Louis-Lucien Klotz.

While it may have been French policy that Germany was to pay, it was recognized early on that Germany was not going to pay for everything immediately. When the Germans defaulted on a payment to France in January 1923, Poincaré, who was then in his first stint as premier, sent the French army to occupy the Ruhr and extract the sums due in kind. As 1923 passed, it had to be admitted that this policy was a failure.

It was this failure that supposedly set in motion the first speculative assault on the franc late in 1923. In the words of Robert Murray Haig:

> ". . .as time went on, it began to be whispered that Germany either could not or would not pay. . .To the Frenchman with his pocket full of Bons de la Defense Nationale, such a whisper brought terror. This was because he realized that if Germany did not pay the bill, his bons would be transformed automatically into something closely resembling worthless tax receipts."[21]

Another factor mentioned as responsible for the 1923-24 run was the failure of the government to live up to the Convention of 1920 with the Bank of France and the large budget deficit of 1923.

The 1925-26 assault on the franc has been attributed to the outcome of the election of 1924 in which the parties of the left won a majority in the Chamber of Deputies. The leading party in this <u>cartel des gauches</u> was the Radical Socialists (which, despite its name, was neither radical nor socialist).[22] Three factors associated with this election have been emphasized as important to the subsequent

franc crisis. The first concerned the means proposed to deal with the fiscal situation (both the budget deficit and the large floating debt):

(1) A forced consolidation of short term debt for long term debt (and at a lower rate of interest).

(2) Some form of capital levy.

(3) An increase in the legal ceiling on the note issue of the Bank of France up to an amount equal to the outstanding national defense bills and, then, the conversion of the bills for notes.[23]

Second, France experienced political instability. While the parties of the left held power they could not agree among themselves on how to address the fiscal situation.[24] As a result, between June 1924 and July 1926, France had seven premiers and nine ministers of finance. By saying no to all alternatives, the _cartel_ said yes, in the minds of many, to inflation.

Third, and supposedly the catalyst for the run, was the revelation in March 1925 that the government had induced the Bank of France to falsify its balance sheet. Even though the government of Premier Herriot was forced to resign, the parties of the left still formed the new government.

Thus, it has been argued that a fear of capital loss on the part of the wealth owners precipitated the run on the franc. This run manisfested itself, in part, in the nonrenewal of subscriptions to government interest bearing debt. The government was then forced to monetize the debt which only served to feed the flames of panic as the public supposedly drew on the recent German experience with hyperinflation.

With the parties of the left unable to agree among themselves on who should head the government, several of them were induced to form a coalition to be headed by the fiscal conservative Raymond Poincaré. Why sudden stability was achieved is the subject of some contention. Some see in Poincaré himself the reason for the return of confidence. This view is best expressed by Martin Wolfe:

"Miraculously the picture seemed to change overnight. The presence

> of Raymond Poincaré at the head of the government apparently was enough to stop the panic. The character of the man himself and his long record of service to France had a great deal to do with this reversal toward confidence. Essentially austere and undemonstrative, he was recognized by most parties as unimpeachably honest and efficient, exactly the sort of cool head France needed in this moment of despair. 'The Rentiers of the Right could entrust him with their purses, and the Puritans of the Left could entrust him with their principles.'"[25]

Others, such as Eleanor Dulles and Ralph Hawtrey, saw in both the new coalition government and the heavy addition to the tax burden the reason for the stabilization -- both were careful to emphasize that these fiscal measures were not radical in nature. Perhaps the most rigorous treatment of the Dulles-Hawtrey view is expressed by Professor Thomas Sargent. For him Poincaré's success is due to the perception by the French that his fiscal changes were of the type that were successful in restoring stability to the European countries that experienced hyperinflation in the early 1920s. That is, the French realized that the worth of money is determined by the fiscal policy that a government employs. In Poincaré's France this was to be one in which budget balance, if not surplus, was, henceforth, to be the rule.

III. ASSESSMENT OF PRIOR INTERPRETATIONS

Examining the statistical record of the period reveals two remarkable aspects of the inflation. First, it was not steady. As noted above, prices rose substantially after the close of World War I into 1920. They they then fell until mid-1922. While their trend was upward from then on, they rose most sharply in late 1923 and early 1924 (then to briefly fall again) and late 1925 into 1926 (just prior to stablization). The second remarkable characteristic of the period is that the government's deficit fell throughout. On the eve of stabilization, its budget was nearly balanced.

Throughout the 1920-25 period, the money supply did not increase rapidly. This is especially true of the growth in Bank of France notes -- presumably the

component reflecting the fiscal demands of the government. With the exception of the very rapid rise in early 1924, during the first of the two major price run-ups, money growth did not really significantly accelerate until the 1925 episode.

At the same time, the government's budget deficit was falling. Major tax increases were enacted in 1920, 1924, and 1925. Together with the receipt of reparations, they were sufficient to bring about a steady reduction of the deficit. As shown in Table 1, the deficit of all the government's various budgets was only 4.2 percent of all expenditures in 1925. The revival of production during the period helped make it less than 1 percent of output. Even without the measures taken by Poincaré, the budget would probably have been balanced in 1926.[26]

While the deficits were being reduced, of course, the debt was still rising. By 1926, the nominal debt of the French government was approximately twice the size it was at the end of the war. Yet, the growth of real output and inflation reduced substantially the ratio of this debt to NNP. From 1.65 in 1920, it was reduced to 1.14 in 1926. Indeed, at the time inflation was about to go out of control, the ratio of debt to NNP in France was lower that what it was in the U.K. at the end of the war (1.26). In real terms it was the same as it had been in 1918, a measure of the effectiveness of inflation in reducing the burden of debt (see Table 5).[27]

Consequently, any explanation of the inflation and stabilization must come to grips with these facts. Principally, it must explain why the inflation occurred when it did, why there were breathing spells of relatively low inflation and deflation between the major episodes of price acceleration, and why the inflation took off when the fiscal situation (both in terms of the deficit and debt) was appreciably better than in earlier years.

It is in this regard that Sargent's characterization of the French inflation is troublesome. He attributes the episode to a budget deficit financed by money

creation. Yet, there is little evidence in the numbers that this was the case. First, the French do not appear to have been trying to finance a significant portion of their deficit through money growth. Second, the deficit was shrinking. Money growth was slower in many of the instances when the budget deficit was larger than it was on the eve of stabilization. Moreover, Sargent's thesis depends on the notion that the public perceived the accession of Poincare as a genuine regime change. Yet, the effort required to balance the budget in 1926 would have been much smaller than the efforts already expended to reduce the deficit in the previous years. How, then, could anyone argue that a fiscal regime change was even necessary for stabilization -- how different, in terms of fiscal management, could the Poincaré regime be?

This may explain the popularity of the various psycholgical theories of the inflation and the repeated emphasis on confidence as a theme of earlier observers. It simply might be argued that earlier tax increases slowed the advance of inflation because they were regarded as first steps (or "down payments" in modern phrasing) toward a more complete fiscal overhaul. Prices slowed their advance in anticipation of future deficit reduction. When the left-center _cartel des gauches_ failed to close the budgetary gap, that gap, even though small, was enough to convince the public that the chore of balancing the budget would not be completed. This, presumably, was enough to precipitate the final "flight from the franc".

This line of reasoning would appear to depend on a velocity driven inflation. While velocity changes are important for many of the years in question (see Table 6), the final acceleration of inflation was accompanied by significant monetary expansion. Thus, even a psychological theory of the inflation requires some explanation of why the money stock grew when it did.

In fact, earlier accounts of the inflation suggest an explanation for this

phenomenon. It lay in the management of the French debt. During the years in which deficits were run, only a relatively small portion of the deficits were financed with long term bonds. A fraction was also financed with shorter term notes. These were generally sold through regular subscriptions at market rates of interest. Most of the remainder was covered by the sale of national defense bills (bons de la defense nationale). These were available continuously at a predetermined discount. Any deficit not covered by these sales was financed by advances from the Bank of France. This arrangement made the money stock endogenous. Failure to sell enough bonds caused the money stock to grow faster. Depending on how many bons were sold, little or much money financing was required. But more than this, it meant that even without a deficit, fiscal demands could cause the money stock to vary. With such a large floating debt, whenever subscriptions failed to match maturities, the Bank of France had to fill the void.

Consequently, psychological factors could help determine the rate of money growth. If holders of the French debt decided for whatever reasons to let it run off, they forced the government to increase the money supply. Thus, anything that caused the public to reduce its holdings of government debt could generate inflation. Moreover, since so much of the debt was in floating form, the money stock could potentially increase very rapidly.

Judging from the writings quoted earlier, contemporary observers believed that the reparations question affected the public's demand for debt in a crucial way. In addition, the continuation of deficits, political instability, and the threat of a capital levy or other increase in taxes are mentioned as reasons for the public's gradual, then sudden, unwillingness to hold debt. These various things caused the public to believe that inflation would worsen, or that prewar parity would not be restored, or that the government would not

honor its debt, or that for some other reason the bondholder's investment would be at risk.

Closer examination of these explanations, however, reveals inconsistencies. First, the matter of a return to pre-war parity would seem an unlikely reason to abandon short term securities. The bons had maturities too short for anyone to have realistically purchased them in expectation of a return to prewar parity. A realization that the franc was permanently devalued should not have affected their desirability. True, the inflation problem was much aggravated in 1925 by the maturation of much of the longer term debt and failure of issues intended to replace it. But the public unwillingness to roll over this debt cannot likely be ascribed to the realization of permanent devaluation either. After all, it was the prospective rather than retrospective change in prices that affected the attractiveness of the debt. Holders of the debt may have come to realize that they had sustained a permanent capital loss, but only if they expected a future loss should they have refused to roll over their holdings.

Thus, it must have been the threat of a future capital loss that caused the refusal of the public to renew all their holdings of government securities. This, therefore, rules out the role of the reparations controversy in the inflation. Reparations were regularized by the Dawes Plan in 1924. Thus, any disillusionment should have occurred earlier. Moreover, by 1926, when the inflation problem got out of hand, reparations were sufficient to cover ongoing French outlays for reconstruction, and various war-related pension and interest expenses associated with past reconstruction financing. At most, then, it could have been the realization that reparations could not pay for the expenditures already undertaken.

This would have, in Haig's words "transformed [the bons] automatically into something closely resembling worthless tax receipts". Yet, it only would have done so in the sense of Barro-Ricardian equivalence. It, thus, would have

reduced perceived wealth of the French people, meaning that the bons (representing in some sense a debt the German people were at first expected to pay) would not be added into any net measure of the wealth of France. But it would not mean that they were literally worthless. The bons still represented a stream of interest payments and repayment of principal. Barro-Ricardian equivalence does not mean that the public does not want to hold government bonds, only that their asset value is fully offset elsewhere by a tax liability. It thus cannot be invoked to explain why the public decreased its desire to hold government securities.

The threat of future inflation would have made the debt less attractive, but as was pointed out, there was nothing obvious about the fiscal regime to suggest a worsening of inflation. The deficit was on its way to disappearing. The debt, though large, was about the same size relative to NNP as was that of the U.K. shortly after the war, and the U.K. deflated its economy.

The threat of a capital levy or forced consolidation of the debt could indeed have caused holders of the debt to fear capital losses. However, the fear was never realistic. First, the bons themselves would have provided some measure of security against these threats. One to three month bons would likely have provided the liquidity needed to escape consolidation. Their anonymity meant that holders could beat any levy by allowing short term bons to run off once a real threat to their capital arose. Second, neither of these options had any real likelihood of being implemented. The Left may have been in control of the Chamber of Deputies, but the French Senate clearly was in a position of block all their programs. Any astute observer of the French political scene at the time knew that a capital levy or forced consolidation could never pass into law.[28]

It is difficult to assess the degree to which perceived political instability contributed to the public's willingness to hold government debt. As long as there was no threat of repudiation of the debt or a possibility that the

government could not generate the wherewithal to service its debt, it is difficult to see how the "waltz of portfolios" could have influenced the rate of inflation. Indeed, the instability ensured that these things would not happen

It might be argued that a fear that the deficit could not be closed produced a fear of inflation. The prospective loss of value of the franc may have made fixed interest securities of the government unattractive. But in fact the deficit was not a problem. It was being closed. The _cartel des gauches_ had even managed a tax increase in late 1925. Further significant tax increases were not necessary to balance the budget. The essential fiscal efforts had been undertaken by the time Poincaré came to office.

For those who point to the rapid "restoration of confidence" that came with the formation of a government by Poincaré as evidence of the influence of political factors, we point out that the first serious episode of inflation/deflation occurred during his earlier term of office. Why anyone would thus see him as _the_ man to save the franc is not immediately clear. If he was the "man of the hour" in 1926, one wonders what happened in 1923-24.

The inflation in France, especially in the year and a half prior to stabilization did not result from monetization of the deficit, but from monetization of the debt. Yet the forces that generated this phenomenon cannot be traced to "confidence" or psychology unless we argue that the public was seized by irrational fears. The reparations crisis, political changes, threats of new taxes, and other oft mentioned explanations could not have produced the pattern of inflationary behavior that occurred in France. At any rate, they could not unless individuals were motivated by groundless fears, or had nonpecuniary motives at work, or simply failed to properly process all of the information available to them.

This, of course, is inconsistent with Sargent's basic hypothesis. If unpredictable shifts in "confidence", disillusionment, and irrational fears caused

the inflation, it is difficult to maintain the proposition that Poincaré was the personification of a regime change and that recognition of this change eased the cost of transition to stable prices. Such a proposition is by its very nature founded on the notion of rational behavior.

We do not believe that Sargent's basic hypothesis is wrong. Nor do we believe that the assumption of rationality needs to be abandoned to explain the inflation and stabilization in France. The behavior of the French public with regard to its holding of the government's debt can be reconciled with rational behavior. It is possible to do so by recognizing that the source of the inflation lay in the monetary rather than the fiscal regime, and that the essence of the Poincaré stabilization lay in changing that regime.

IV. AN ALTERNATIVE INTERPRETATION

The key to understanding the stabilization of 1926 and the events leading up to it is to recall that the French Treasury did not always sell as much debt as it wanted. In short, debt was not always sold at a competitive interest rate. Mostly, the French Treasury relied heavily on the short-term national defense bills. These were supplied to the public on a continuous basis at fixed rates of interest which varied depending on the maturity of the bill. Between January 1, 1919 and mid-July 1926, the rates of interest were changed only twice: On March 12, 1922, the rate on 1 month, 3 month, 6 month and 1 year bills, the four maturity categories available, were lowered respectively from 3.6% to 3%, 4% to 3.5%, 4.5% to 4%, and 5% to 4.5%; and on February 19, 1923 the rates on the three longer term maturities were raised back to the rates prevailing prior to March 12, 1922. (On August 1, 1926, after the crisis, the rates on all four maturities were raised, respectively, from 3% to 3.6%, 4% to 5%, 4.5% to 5.5%, and 5.0% to 6.0%).[29] All funds which could not

be raised by the sale of bills to finance the normal government budget deficit were obtained from the Bank of France (long term debt, as noted above, was used mainly for the reconstruction of the war damaged areas). Consequently, the Treasury set the interest rate. To the extent that it was not the market interest rate, excess supply or demand for government debt resulted. Money growth was then determined by the deviation of the interest rate set by the Treasury for its debt, and the rate that would otherwise have prevailed in a market environment.

This method of finance closely resembles the method used by the United States during World War II and for several years thereafter. On December 8, 1941, the yields on U.S. government securities were frozen at the then prevailing market levels. All the funds which the government could not raise at those rates to cover the budget deficit were raised by borrowing from the Federal Reserve.

When interest rates are held constant, the supply of money and credit is essentially infinitely elastic. In the case of France, various commentators, such as Hawtrey and Dulles, drew attention to the fact that the discount rate of the Bank of France, the only monetary policy tool available to the Bank, was ineffective in halting the various waves of speculation against the franc. Hawtrey attributes this failure to the Banks' large holdings of government paper while Mrs. Dulles attributes it to the ongoing inflation, i.e., small discount rate changes are ineffective in changing the cost of credit in an inflationary environment.

As we see it, the failure of the discount rate to be effective is due to the policy of stabilizing interest rates. Whenever the Bank of France attempted to tighten credit by raising the discount rate, holders of national defense bills would let them run off and provide themselves with whatever funds they needed. Essentially, then, the Bank of France could not pursue an independent

monetary policy so long as the French Treasury pegged interest rates. As is well known, such a monetary system is inherently unstable. Any change in the natural rate of interest can lead to a cumulative inflation or deflation. In the French case, a rise in the natural rate would put upward pressure on market interest rates. This would induce holders of Treasury bills to let them run off and force the government to monetize them as well as monetize any ongoing deficit. Should inflation ensue, the operation of the Fisher Effect would lead to still higher market rates, more monetization and inflation in a cumulative process that could end in hyperinflation. Such a cumulative process could also be set in motion by developments in foreign countries. Any significant rise in real interest rates abroad could induce a capital outflow -- an outflow whose wherewithal, in the French case, could be obtained from a run off of Treasury bills.[30]

The monetary regime in France was then, at best, one of knife-edged stability. When the Treasury set its interest rates at the natural rate, debt could be sold in whatever quantities the government chose and the money stock could be changed as desired. Otherwise, cumulative inflation or deflation was set in motion. This explains why the same fiscal regime that generated accelerating inflation in 1926 was capable of producing price declines for some years. During the post-war depression, for example, France was able to honor its agreement to repay advances from the Bank of France. This was because world-wide demand conditions had lowered the natural rate below the rate pegged by the Treasury.

While many interpreters of this era focused on French political developments to explain the flight of capital from France, it is worth noting that at the time the Herriot cabinet fell over the falsification of the Bank of France statements, Great Britain returned to the gold standard. Even though market interest rates were lower in the U.S. and U.K. (see Table 7) than in France, both countries

had either falling or constant prices in contrast to the inflation in France. As a result, the *ex post* real rates in both countries were higher, and likely to have been perceived to have been higher *ex ante*, than in France.[31] This might have been the motivating force attracting capital from France. Once the outflow started, the nature of the French monetary system made accelerating inflation a reasonable probability. This, in turn, only served to accelerate the capital outflow. Thus, the franc debacle may not necessarily have been motivated by the fear of capital expropriation. It may have been in response to a higher rate of return abroad in countries with stable prices and a monetary regime which served to guarantee stability. The normal rise in French interest rates which would have operated to restore equilibrium could not operate in the type of monetary environment that prevailed in France.

Of course, any comparison of real interest rates across countries consists largely of conjecture. However, one particular debt issue in 1925 invites comparison. By that year a number of notes issued earlier were maturing and the floating debt problem was exacerbated by the failure of the public to invest in new issues. One offering intended to help refund these maturing obligations that garnered less than half the subscriptions the government hoped for, was the *garantie-de-change* rentes of 1925. These securities (which could be purchased with short term bonds) paid interest in francs that varied with the exchange value of the British pound. At 95 francs per pound or less, a four percent (in francs) return was guaranteed. Increases in the value of the pound above 95 francs increased the return (in francs) proportionally.

At the time of the offerring (July 20, 1925 to October 20, 1925) the pound exchanged for approximately 103 to 105 francs, producing a yield of 4.3 to 4.4 percent in pounds. British consols in 1925 were yielding slightly more on

average (yields on all British issues of 30 years maturity or longer were higher).[32] In 1924, when the French government floated short term notes in Britain, it offerred a 6 percent interest rate, a higher yield than it would offer a year later to its own citizens. It would seem that the French government had gotten to the point that it did not want to pay a competitive rate even on its long term debt (except when sold abroad where it had no choice). This policy is what required inflation.

Thus, the success of Poincaré lay in ending the policy of pegging interest rates. This change was instituted in the form of the _Caisse d' amortissement_. Given its own source of revenue, the _Caisse_ was essentially a guarantee that the government stood ready to bear the full market cost of servicing its debt. The overhang of a large floating debt was to be reduced by slowly eliminating the _Bons_ and replacing them with longer term issues; a sinking fund to actually retire the issues was created.[33] The money supply could become exogenous.

Oddly, contemporary writers saw little of significance in the _Caisse_. For Hawtrey it was the means for dealing with the troublesome floating debt and would not have been successful if it had not been given various tax revenues with which to retire the debt. Similarly, Eleanor Dulles declared "... the establishment of the _Caisse de gestion des bons de la defense nationale_ did not alter the situation in a marked way. It was a step in advance, in that it established a procedure and an organization for handling the floating debt, but it was neither revolutionary nor novel in its essential outline."[34]

Yet, the creation of the _Caisse_ was the Accord between the French Treasury and the Bank of France. It meant that France would abolish the practice of issuing short term debt at fixed rates of interest. The central bank was, thus, freed from its implicit role of pegging interest rates and could reassert its control over the monetary base.

Even without any alteration in taxes, the creation of the _Caisse_ would

have stabilized the franc. Admittedly, paying higher real interest rates on the debt would have tended to widen any budgetary deficit in the absence of additional taxes. However, since some interest being paid before stabilization obviously included a substantial inflation premium, at least part of the deficit in 1925 was illusory anyway, being an early repayment of real principal in the form of interest. This is underscored by the reduced interest rates that the Caisse was able to pay on its obligations. Consequently, the fiscal change that mattered was primarily related to debt management rather than taxes.

Of course the Caisse was not created immediately upon Poincare's accession to office, nor was it explicitly promised. It was, however, a recommendation in a report completed by a group of experts shortly before the franc crisis on the basis of which it was known Poincaré would fashion his stabilization program. The immediate and dramatic recovery of the franc during the July through September period owes a great deal to the intervention by the government in the foreign exchange market.

V. CONCLUSION

During the post-World War I period, France experienced an inflation that reached triple digit rates in the final months before it stabilized in July 1926. This experience has been likened to the beginnings of the great hyper-inflations of Germany, Hungary, Austria, Poland, and Russia that occurred in the years immediately following the war. More than one observer has attributed it to the same cause: large budget deficits financed by money creation. Sargent, in particular, has argued that the change in the fiscal regime brought about by the Poincaré government formed in July 1926 was responsible for stabilizing the price level. He further argues that public recognition of the meaning of Poincaré's accession helped minimize the real costs of adjustment and sped the response of prices to the stabilization program.

We argue that the nature of the inflation was fundamentally different from those experienced in the hyperinflation countries, not only in magnitude but in cause. Deficits could not have been the principal cause of the the French inflation because the budget was nearly balanced by the time the inflation reached its highest levels. The real cause of the inflation lay in the monetary regime.

The French government financed most of its deficits during this period with floating debt -- securities of maturities of a year or less, available continuously for sale at interest rates fixed by the French Treasury. Because the rates on this debt did not always reflect market determined rates, it was often impossible to sell enough of the securities to replace those maturing at any given time. What couldn't be financed by this means and the occasional issue of longer term notes and bonds was covered by money creation. Hence, even in an environment of a nearly balanced budget, debt management policy combined with central bank action caused the money supply to grow rapidly when the public chose no longer to hold the government debt.

In essence the Bank of France was forced to peg interest rates at levels established by the Treasury, much in the same fashion as the Federal Reserve had to during and after World War II. This made the money supply endogenous. When the interest rates offerred by the Treasury were too low, renewals of securities were insufficient to cover maturities and the money stock grew. The Fisher Effect of the resulting inflation on nominal interest rates made the process cumulative, putting the economy on the track of accelerating inflation.

This view -- that it was the pegging of interest rates below market levels that explained the inflation -- also explains the periods of declining inflation during the post-war period. For brief intervals, the interest offered by the Treasury was in excess of the natural rate of interest, creating a tendency to deflate. This contrasts with the views of many contemporaries who saw the reluctance

to hold government debt at crucial times as a reflection of loss of confidence, disillusionment, and political uneasiness.

Our view can be reconciled with the evidence and with normal assumptions of rationality. We are saying that the public (at least most of the public that had the means to buy substantial amounts of the debt) understood the essentials of the monetary regime in France and, acting on their knowledge, precipitated the crisis of mid-1926. It suggests an expectations formation that is reasonable and predictable in contrast to the characterization of the process by contemporaries as fleeting, volatile, and mercurial shifts in undefined "confidence".

Our analysis, moreover, is consistent with Sargent's basis proposition -- that the public perceived a regime change and adjusted its behavior accordingly. In this case, however, it was the monetary regime that changed. The public was confident that Poincaré would address the problem of the floating debt the only possible way -- by refunding it with longer term issues floated at market determined rates -- and that is exactly what happened under the auspices of the *Caisse d' amortisement*.

FOOTNOTES

[1] See Thomas J. Sargent, "Stopping Moderate Inflation: The Methods of Poincaré and Thatcher" in Dornbusch and Simonsen, eds., Inflation, Debt and Indexation. MIT Press, Cambridge, Mass. (1984): 54-96.

[2] Thomas J. Sargent, "The Ends of Four Big Inflations", in R. Hall, editor, Inflation: Causes and Effects. University of Chicago Press. Chicago, Ill. (1982): 19-72; William Bomberger and Gail Makinen, "The Hungarian Hyperinflation and Stabilization of 1945-46", Journal of Political Economy. Vol. 91 (October 1983): 801-824; Gail Makinen, "The Greek Stabilization of 1944-46", American Economic Review, (December 1984): 1067-1074; Gail Makinen and Thomas Woodward, "The Taiwanese Hyperinflation and Stabilization of 1945-1952" (forthcoming).

[3] It is not easy to say anything certain about the French budget deficit. Our data are taken from Annuaire Statistique de la France (1966): 485. These data were first published shortly after World War II. The data on the deficits available during the 1920s are very uncertain. One must first contend with three different budgets plus a number of off-budget items. Second, budget receipts are in reality tax assessments, some of which could be paid with interest-bearing debt at that debt's issue value rather than market value. Similarly, budget expenditures are not actual outlays, but expenditure authorizations. Third, the budget year actually extends for more than a year in terms of when the books for receipts and expenditures are finally closed. What we show as the deficit for all three budgets on table 1 is different from that shown in contemporary accounts. For example, the data below contrasts Dulles' estimate of the deficits from extant official sources with that compiled by Robert Murray Haig from annual borrowings.

Budget Deficits
(billions of Francs)

Year	Dulles	Haig
1920	38.0	37.7
1921	28.0	24.9
1922	24.7	17.4
1923	18.1	15.8
1924	9.1	6.8
1925	4.7	4.4
1926	+0.2	1.5

Source: Eleanor Lansing Dulles, The French Franc, 1914-1928. McMillan Co., New York (1929): p. 494; and Robert Murray Haig, The Public Finances of Post-War France. Columbia University Press, New York (1929): p. 46.

While each estimate is different from our data, all estimates show the same downturn trend.

[4] Until 1927, the bills were issued in maturities of one, three and six months and one year. The bills were a major means for financing the budget deficit. They were on sale continuously at all commercial banks, the Bank of France, post offices, and offices of the Ministry of Finance. To encourage sales, commissions were paid.

[5] To finance the immediate reconstruction, the French government established an institution known as the Credit National that in the period December 1919 to January 1924 floated a series of eight longer-term bonds issues.

[6] The statutory limits on advances to the State by, and the note issue of, the Bank of France were:

Advances to the State	(Billions of Francs)	Limit on Note Issue	
December 22, 1984	22.0	September 28, 1920	41.0
April 15, 1925	26.0	April 15, 1925	45.0
June 30, 1925	32.0	July 12, 1925	51.0
November 24, 1925	39.5	December 3, 1925	58.5
Decmeber 3, 1925	39.5		
December 31, 1926	37.5		

[7] For the sums involved, see Haig, Op. Cit., p. 215.

[8] The schedule of maturing longer-term debt in millions of francs during 1925 was: February 16, 333; July 1, 3, 290; September 25, 8,237; and December 8, 10,090.

[9] The double decime was an increase in most existing taxes by 20 percent. In addition, the proposal reduced various expenditures by 1 billion francs.

[10] The government was empowered to raise all specific taxes up to six times the pre-war rates. The turnover tax was set at 2 percent for practically everyone. Customs duties, postal rates and taxes on passenger and freight rail service and on automobiles were raised. While the highest income tax rate was reduced from 60 to 30 percent, the lower rates were raised and applied to a broader range of incomes. The revenue from the tobacco monopoly, which had accrued to the Treasury, was now assigned to the sinking fund as well the receipts from the inheritance and estate taxes and the new 7 percent tax on the first sale of real estate and businesses (a form of capital levy). Since the activities of the sinking fund were not carried on the French budget, the total increase in tax revenue during 1926 and 1927 was really quite significant. Hawtrey, using contemporary data, estimated that the tax increase was sufficient to raise revenue from 31.2 billion francs in 1925 to 50.1 billion in 1927 (43.9 billion in regular revenue plus 6.2 billion for the sinking fund). See Ralph Hawtrey, The Art of Central Banking. Cass, London (1962): 15.

[11] See Sargent, The Methods of Poincaré, Op. Cit., and Leland B. Yeager, Experiences with Stopping Inflation. American Enterprise Institute, Washington, D.C. (1981).

[12] Thomas J. Sargent, The Methods of Poincaré, Op. Cit., p. 60.

[13] Ralph Hawtrey, Op. Cit., pp. 3-4.

[14] James Harvey Rogers, Op. Cit., p. 56.

[15] William Adams Brown, Jr., The International Gold Standard Reinterpreted, 1914-1934. NBER, New York (1940): 436.

[16] Martin Wolfe, The French Franc Between the Wars, 1919-1939. Columbia University Press, New York (1951): 44.

[17] Eleanor Lansing Dulles, Op. Cit., p. 199.

[18] Tom Kemp, The French Economy 1919-1939. St. Martin's Press, London (1972): pp. 74 and 80.

[19] Thomas J. Sargent, The Methods of Poincaré, Op. Cit., p. 61.

[20] Leland B. Yeager, Op. Cit., p.90.

[21] Robert Murray Haig, Op. Cit., p. 43.

[22] William Shirer writing in 1969 would describe this party whose members were country lawyers, merchants, and a few university professors as no more radical than the Democratic party in the United States. See his The Collapse of the Third Republic. Simon and Schuster, New York (1969): 155.

[23] This proposal was based on the argument that the bills were money. Therefore, whether they remained as bills or were converted into notes made no difference to such macro aggregates as the price level and interest rates. In some respects this view anticipates the monetary theory of Neil Wallace as expressed in "A Legal Restrictions Theory of the Demand for 'Money' and the Role of Monetary Policy". Federal Reserve Bank of Minneapolis Quarterly Review (Winter 1983). p. 1-7. For a discussion of the bons as a counter-example, see Gail Makinen and Thomas Woodward, "Some Anecdotal Evidence Relating to the Legal Restrictions Theory of the Demand for Money". Journal of Political Economy. April (1986).

[24] A number of writers about this era have cited the fear of a capital levy as a force motivating the final run on the franc. It should be noted that this proposal was associated only with the Radical Socialist party. When its leader Herriot resigned as premier over the issue of the falsified Bank of France statements, the incoming Finance Minister, Joseph Caillaux, specifically rejected it as a means for dealing with the fiscal situation.

[25] Martin Wolfe, Op. Cit., p. 44.

[26] Recall the since Poincare did not come to office until late July 1926, he would have had only moderate influence over the budget for that year.

[27] The data for the United Kingom public debt are taken from Robert Barro, Macroeconomics. John Wiley & Sons, New York (1984): 368.

[28] The French Senate during the Third Republic was not a mere debating society. It had substantial power. It was the Senate whose vote of "no confidence" forced Herriot to resign in the Bank of France scandal in 1925. This chamber was dominated by conservative parties. See also, footnote 24.

[29] These data are from Haig, Op. Cit., p. 240.

[30] We are aware of only one other researcher who had noted this property. See S. C. Tsiang, "Fluctuating Exchange Rates in Countries with Relatively Stable Economies". International Monetary Fund Staff Papers. Vol. 71, No. 2. (October 1959): 244-273.

[31] Some writers, notably Dulles, uses the net run-off of the national defense bills as an index of public confidence in the French economy. We are inclined to see the run-off as motivated by market forces. As an example, whenever short term interest rates in France were above the fixed rates on the bills, as they were during most of 1922, 23, 24, 25, and 26, the net run-off was positive. This phenomenon is shown graphically on chart 43 in James Harvey Rogers, Op. Cit., p. 230.

[32] These data are taken from Sidney Homer, A History of Interest Rates. 2nd edition, Rutgers University Press. New Brunswick, New Jersey (1963). The rates in Great Britain are reported on an annual basis and are hard to compare directly to the rates offerred in a 3 month period in France. Nonetheless, they appear marginally higher.

[33] The sale of national defense bills of one month maturity was discontinued on December 16, 1926; of three months maturity on December 22, 1926; of six months maturity on January 29, 1927; and of one year maturity on June 2, 1927.

[34] Eleanor Lansing Dulles, Op. Cit., p. 258.

Table 1
French Budget Deficits, 1920-1926
(billions of francs)

Year	Deficits of all Budgets	Deficits/ Expenditures	Deficits/ Nominal Income
1920	17.1	43.2%	12.9%
1921	9.3	28.2	6.6
1922	9.8	21.6	6.7
1923	11.8	30.8	7.2
1924	7.1	16.8	4.4
1925	1.5	4.2	.7
1926	+1.1	+2.4	+.4

Source: The deficit data are derived from a combination of ordinary, extraordinary, and recoverable (from German reparations) budgets. Expenses are the total from all three budgets. Nominal NNP are from estimates made by Colin Clark. All data are taken from _Annuaire Statistique de la France_ (1966): pp. 485 and 556.

Table 2
Distribution of Internal National Debt
(billions of francs)

Year	Short Term Bonds	Long Term Bonds	Advances*	National Defense Bills	Deposits with Treasury	External Debt**
1920	.4	133.2	30.6	50.9	4.1	36.0
1921	10.3	138.4	28.7	60.4	3.6	35.7
1922	26.8	134.0	28.0	59.1	6.5	35.4
1923	39.9	143.8	27.9	57.7	5.9	35.7
1924	46.6	146.5	27.5	56.4	8.5	36.5
1925	39.5	153.2	41.2	48.1	9.6	36.5
1926	38.8	156.9	41.6	44.5	10.1	36.7

Source: James Harvey Rogers, The Process of Inflation in France 1914-1927. Columbia University Press, New York (1929): 4.

*Advances includes amount lent by the Bank of Algeria and funds lent by France to Imperial Russia.

** Measured in billions of gold francs.

Table 3
The Growth in Real National Income and Industrial Production
(billions of 1938 francs)

Year	Real National Income	Growth in Real National Income	Industrial Production Index*
1920	270.0		65.5
1921	250.0	-7.4%	54.4
1922	304.0	21.6	81.5
1923	329.0	8.2	91.7
1924	381.0	15.8	110.2
1925	384.0	.8	109.0
1926	401.0	4.4	125.3

Source: The real national income estimates are taken from Alfred Sauvy as reported in Annuaire Statistique de la France (1966): 556. Index of Industrial Production is taken from Eleanor Lansing Dulles, Op. Cit., p. 502.

* 1913 = 100.0

Table 4
Selected Data on Bank of France Notes, M1, Inflation, and Exchange Rates
(Notes and M1 in billions of francs)

Year and Quarter	Bank of France Notes Level	Bank of France Notes %Change	M1 Level	M1 %Change	Prices: Wholesale Level	Prices: Wholesale %Change	Prices: Retail Level	Prices: Retail %Change	Exchange Rate*
1920:1	37.7	6.6	61.9	25.4	532	178.0	309	42.1	7.2
2	37.6	—	62.8	5.9	555	18.4	368	101.2	7.1
3	38.1	5.4	63.3	3.2	518	-24.1	384	18.6	7.1
4	38.4	3.2	64.7	9.1	475	-29.3	424	48.6	6.1
1921:1	37.9	-5.1	63.2	-9.0	389	-55.0	383	-33.4	7.1
2	38.0	1.1	63.2	—	341	-41.0	319	-51.9	8.0
3	36.9	-11.1	61.1	-12.6	342	1.2	317	-2.5	7.5
4	36.7	-2.0	61.9	5.3	337	-5.7	327	13.2	7.4
1922:1	36.0	-7.6	61.2	-4.4	316	-22.7	307	-22.3	8.7
2	35.8	-2.2	62.0	5.3	325	11.9	309	2.6	8.9
3	36.3	5.7	62.4	2.6	335	12.9	292	-20.3	7.9
4	36.3	—	62.5	.6	358	30.4	297	7.0	7.1
1923:1	37.0	7.9	63.2	4.6	420	89.4	315	26.5	6.3
2	36.5	-5.3	63.7	3.2	418	-1.9	325	13.3	6.5
3	37.2	7.9	64.9	7.8	423	4.9	329	5.0	5.9
4	37.6	4.4	64.7	-1.2	450	28.1	356	37.1	5.4
1924:1	39.1	16.9	69.1	30.1	523	82.5	384	35.4	4.6
2	39.6	5.2	68.7	-2.3	467	-36.4	376	-8.1	5.6
3	40.1	5.1	70.2	9.0	491	22.2	367	-9.2	5.2
4	40.5	4.1	69.6	-3.4	513	19.2	394	32.8	5.3
1925:1	40.7	2.0	69.8	1.2	525	9.7	411	18.4	5.3
2	42.8	22.3	72.8	18.3	536	8.6	416	5.0	5.0
3	44.8	20.0	78.8	37.3	568	26.1	425	8.9	4.7
4	48.3	35.1	85.1	36.0	616	38.3	447	22.4	3.9
1926:1	51.0	24.3	90.8	29.6	647	21.7	491	45.6	3.6
2	52.6	13.2	94.3	16.3	707	42.6	523	28.7	3.1
3	55.2	21.3	98.9	21.0	814	75.7	584	55.5	2.7
4	53.4	-12.4	97.0	-7.5	703	-44.4	615	23.0	3.5

Sources: All percentage changes are annualized quarterly rates of change. The M1 data are taken from James Harvey Rogers, Op. Cit. To derive this series, Rogers had to extrapolate from the experiences of the four large French banks and adjust the Bank of France note series on the assumption that 3 percent of deposits were held in the form of a note reserve.

*In U.S. cents per franc.

Table 5
Selected Measures of French Public Debt
(billions of francs)

Year	Total Internal Debt	Nominal NNP	Total Debt/ NNP	Wholesale Prices	Real Debt
1918	140.8	N.A.	N.A.	100	140.8
1919	181.9	N.A.	N.A.	105	173.2
1920	219.2	133.0	1.65	151	145.2
1921	241.4	140.0	1.72	102	236.7
1922	254.4	146.0	1.74	96	265.0
1923	275.2	163.0	1.69	124	221.9
1924	285.5	188.0	1.52	144	198.3
1925	291.6	208.0	1.40	162	180.0
1926	291.9	255.0	1.14	207	141.0

Source: See Tables 1, 2, and 4.

Table 6
Money, Income, and Velocity, 1920-1927
(billions of francs)

Year	M1	Nominal Net National Product	Velocity
1920	63.2	133.0	2.10
1921	62.4	140.0	2.25
1922	62.0	146.0	2.35
1923	64.1	163.0	2.54
1924	69.4	188.0	2.71
1925	76.6	208.0	2.71
1926	95.3	255.0	2.68
1927	99.5	259.0	2.60

Source: M1 data are computed from Rogers, *Op. Cit.* Nominal net national product are estimates made by Colin Clark and reported in *Annuaire Statistique de la France* (1966): 556.

Table 7
Selected Interest Rates

	United States			United Kingdom			France			
Year and Quarater	Bnkrs Accept (3-mo.)	Prime Comm. Paper (3-mo.)	Call Loans	Bnkrs Accept (3-mo.)	Treas. Bills (3-mo.)	Day to Day Money	Nat'l Dfnse Bills (1-mo.)	Nat'l Dfnse Bills (3-mo.)	Comm. Paper (3-mo.)	Report Rate*
1924:1	4.04	4.88	4.27	3.34	3.21	2.33	3.0	4.0	N.A.	3.0
2	3.25	4.42	3.25	3.05	2.97	2.17	3.0	4.0	5.0	4.3
3	2.11	3.29	2.07	3.71	3.65	2.75	3.0	4.0	5.1	5.0
4	2.50	3.34	2.83	3.72	3.69	2.76	3.0	4.0	5.3	5.3
1925:1	3.10	3.75	3.64	4.04	4.00	3.22	3.0	4.0	5.9	4.4
2	3.21	3.92	3.91	4.44	4.32	3.84	3.0	4.0	5.5	4.0
3	3.33	4.04	4.28	3.99	3.92	3.39	3.0	4.0	4.8	4.8
4	3.50	4.38	4.96	4.05	4.20	3.30	3.0	4.0	4.5	4.5
1926:1	3.63	4.34	4.64	4.48	4.46	4.09	3.0	4.0	4.0	4.4
2	3.27	4.13	3.97	4.33	4.35	3.97	3.0	4.0	4.9	5.5
3	3.61	4.34	4.64	4.42	4.50	3.95	3.6	5.0	6.6	6.6
4	3.83	4.54	4.82	4.60	4.73	3.93	3.6	5.0	6.3	4.5

Source: Data for the U.S. and U.K. are taken from _Banking and Monetary Statistics 1914-1941_. Board of Governors of the Federal Reserve. Washington, D.C. (1943): pp. 450 and 656. Data for France are from James Harvey Rogers, _Op. Cit._, pp. 237 and 231.

*The Report Rate is a short term rate collateralized by stock exchange securities.