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STOPPING MODERATE INFLATIONS: THE METHODS OF POINCARÉ AND THATCHER

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1. Introduction

In June 1979, Margaret Thatcher's administration began governing the United Kingdom. One of her primary goals was markedly to reduce the rate of inflation, a goal which was understandable in view of the experience of the past decade in which the United Kingdom's rate of inflation had on average exceeded the rate of inflation in other industrial countries. Advocates of each of the two main groups of contemporary theories about inflation dynamics could have told Mrs. Thatcher that achieving that goal would be difficult, although the two groups would have characterized the nature of the difficulties quite differently. The first group consists of the "momentum" or "core inflation" theories.[1/] The second group comprises the rational expectations - equilibrium theories.[2/]

The first group of theories posits that there is some inherent momentum in the process of inflation itself, and that this momentum or persistence is neither superficial nor merely a reflection of slowly moving deeper forces that themselves cause inflation to behave as it does. Two distinct possible sources of sluggishness in inflation have been proposed. One is the notion of adaptive or autoregressive expectations. According to this doctrine, workers and firms form expectations about future rates of inflation by computing a moving average of current and lagged rates of inflation. The moving average makes expected inflation a simple <u>function</u> of current and past rates of inflation. Further, the weights in the moving average are assumed to be fixed numbers that are independent of the economic environment, including government monetary and fiscal policy, and that are taken to characterize the psychology of expectations. Since firms and workers set current and future nominal wages

and prices in large part as functions of their expected rates of inflation, this model of inflationary expectations makes the actual rate of inflation appear to be a long weighted average of past inflation rates. Inflation is also an inverse function of the unemployment rate via a Phillips curve mechanism. According to this theory, the only way to eliminate inflation through conventional monetary and fiscal restraint is by moving along the "short-run" Phillips curve and suffering a period of high unemployment long enough to break the slowly moving inflationary expectations. In this model, the momentum in the inflation process and the high cost in terms of unemployment of ending inflation is caused by the irrational nature of agents' expectations. Reductions in inflation are costly because it takes agents a long time to understand that they are in a less inflationary environment. If they learned faster, reducing inflation would be less costly.

A second and more sophisticated mechanism that can lead to a notion of intrinsic momentum in inflation is the staggered wage contract model of John Taylor [42] and Phelps and Taylor [33]. Taylor posits rational expectations, so that agents in his model form expectations of inflation as functions of all of the variables relevant for forecasting future inflation. As a result of positing rationality, the particular function that agents optimally use to forecast inflation responds systematically and predictably to the economic environment, including the monetary policy and fiscal policy regimes, contrary to the fixed-function forecasts assumed under adaptive expectations. The source of momentum or persistence in Taylor's model comes from the overlapping structure of long-term wage contracts, and a particular nonstate contingent form that he imposes on

contracts. In this class of models, in terms of unemployment it is costly to end inflation because firms and workers are now locked into long-term wage contracts that were negotiated on the basis of wage and price expectations that prevailed in the past. In Taylor's model, as in all rational expectations models, the observed momentum or serial correlation in the inflation process partly reflects the serial correlation in the "first causes" of inflation, such as monetary and fiscal variables. In addition, however, the wage - contracting mechanism contributes some momentum of its own to the process, so that the resulting sluggishness in inflation cannot be completely eliminated or overcome by appropriate changes in monetary and fiscal policies. The wage-contracting process gives rise to a non-trivial tradeoff between the variance of inflation and the variance of unemployment.

Members of the second group of theories of inflation, rational expectations, equilibrium theories, maintain that essentially all of the characteristics of the serial correlation of inflation are inherited from the random properties of the deeper causes of inflation, such as monetary and fiscal policy variables. These theories differ from Taylor's kind of theory in viewing wage and price contracts, whether implicit and explicit, as more state - contingent, and contracting procedures as more responsive to the economic environment.[3/] In order to explain observed Phillips curve tradeoffs, these theories resort to the Phelps - Lucas device of information limitations and the temporary confusions that they cause. When measures of aggregate demand and/or variables that partially reflect them such as prices and interest rates are realized to differ from what they had previously been rationally expected to be, it sets in motion

movements in real economic variables. On this view, the first cause of business cycle fluctuations is uncertainty about the position of future and maybe even current relative prices and productivity disturbances.

While differing among themselves in many important substantive details, members of the second group of theories are united by their assertion that under the proper hypothetical conditions, a government could eliminate inflation very rapidly and with virtually no "Phillips curve" costs in terms of foregone real output or increased unemployment. The "measure" that would accomplish this would be a once-and-for-all, widely understood, and widely agreed upon change in the monetary or fiscal policy regime. Here a regime is taken to be a function or rule for repeatedly selecting the economic policy variable or variables in question as a function of the state of the economy. Particular models within this class differ widely with respect to the particular policy variables (e.g., high-powered money, a wider monetary aggregate, or total government debt) which are focused upon. However, all the theories require that the change in the rule for the pertinent variable be widely understood, uncontroversial and unlikely to be reversed. These characteristics are essential in eliminating the costs in terms of foregone output that information limitations and confusions cause via the Phelps - Lucas version of the Phillips curve.

According to either of these groups of theories, Mrs. Thatcher has faced a formidable task. The momentum view obviously and directly implies that she could use monetary and fiscal variables to depress inflation only at the cost of also depressing real economic activity. The rational expectations, equilibrium view suggests that it is not in the power of a Prime Minister or even a united political party to create the circumstances

required to bring about a quick and costless end to inflation. Whether or not the stage is set for successfully implementing a significant new policy regime is the result of intellectual and historical forces that individual political figures influence only marginally. Mrs. Thatcher comes to power against the background of over twenty years of "stop - go" or reversible government policy actions.[4/] Her economic policy actions are vigorously opposed both by members of the Labor Party, and by a strong new party, the Social Democrats. Thus, the economic spokesman for the Labor Party, Mr. Peter Shore, advocates an immediate 40 percent devaluation and a larger government deficit. Mrs. Thatcher's party now runs third in the political opinion polls. In addition, throughout her administration, speculation has waxed and waned about whether Mrs. Thatcher herself would be driven to implement a "U - turn" in macroeconomic policy actions, and whether her stringent monetary policy actions would be reversed by the Conservative Party itself, by choosing a new party leader. Furthermore, there is widespread dissent from Thatcher's actions among British macroeconomic scholars, so that she cannot be regarded as implementing a widely agreed upon theory. For all of these reasons, it is difficult to interpret Thatcher's policy actions in terms of the kind of once-and-for-all, widely believed, uncontroversial, and irreversible regime change that rational expectations equilibrium theories assert can cure inflation at little or no cost in terms of real output.[5/] This is not to render a negative judgment on Thatcher's goal or her methods, but only to indicate that the preconditions for the applicability of rational expectations "neutrality" or "policy irrelevance" theorem don't seem to exist in Margaret Thatcher's England. Where these conditions are not met, rational

expectations equilibrium models imply that contractionary monetary and fiscal policy actions are likely to be costly in terms of real output and unemployment.

2. The "Poincaré Miracle"

We have seen that extensive preconditions must obtain before rational expectations, equilibrium theories can be taken to imply that there is a costless cure to inflation, or equivalently, that the neutrality theorems of the theory can be expected closely to approximate reality. It has been argued by some that these preconditions are so stringent that they have rarely if ever been satisfied in practice, so that the example of Thatcher's England is the standard case. While this is a respectable argument it is useful to point out that there are repeated historical episodes that seem to fit the rational expectations equilibrium model fairly well. I have recently described four such episodes, namely the events surrounding the ends of hyperinflations in Poland, Germany, Austria and Hungary in 1922 - 24 [39]. Each of those countries successfully stopped drastic inflations dead in their tracks by interrelated fiscal and monetary policy changes that can be interpreted as abrupt changes in regime. The costs in terms of foregone output were much smaller than would be suggested by modern estimates of Phillips curves, and were in no sense proportional to the magnitudes of the inflations that were halted. Some readers' response to those examples has been that because those inflations were so spectacular, between 5,000 and 1,000,000 percent per year, the procedures undertaken to end them have few implications about the problem of ending more moderate inflations like the ones faced by

industrialized countries today. The argument seems to rest on an appeal to a model in the style of Taylor [43], and asserts that the hyperinflations had proceeded to the point that the institution of long-term nominal contracts had ceased to operate, thereby erasing the dominant source of momentum in the inflation process. The argument is then that for milder inflations, the existence of long-term nominal contracts still remains a source of momentum that will make it costly in terms of real output and unemployment to end inflation quickly by draconian changes in fiscal or monetary regime.[6/]

However, in the 1920s other countries successfully used essentially the same monetary and fiscal reforms that worked in Austria, Poland, Germany and Hungary to stabilize much milder currency depreciation.[7/] One dramatic example was the stabilization of the French franc that was achieved by the government formed by Raymond Poincaré in July 1926.[8/] (Tables F1 - F2 report the French wholesale price index and the dollar-franc exchange rate between 1913 and 1927.) Poincaré formed his government at a time when it was universally recognized that "the country was in trouble again and all political parties except the Socialists and Communists gathered behind Poincaré. Five former premiers joined his government. There was a political truce," Shirer [41, 163]. For some time there had been 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, together with firm limits on the amount of government debt monetized by the Bank of France. For several years, a political struggle had been waged over whose taxes would be raised, with the monied interests in the country resisting efforts to

raise taxes on them.[9] The accession to power of Poincaré in 1926 settled that issue in a fashion acceptable to the country's monied interests.

France financed its effort in World War I by borrowing at home and abroad, mainly in the United States. After the war, France continued to run substantial government deficits. That it did so was partly rationalized by the expectation that "Germany will pay" for the French deficits. Under the Treaty of Versailles, Germany was obligated to pay massive reparations, which the French used partly to finance the reconstruction of territories devastated during the war. However, neither the total amount to be paid, nor the payment schedule was fixed by the treaty. Instead, these were to be determined by the Reparations Commission, and in the event were subject to continuous revision and renegotiation. The uncertain character of these claims complicated the public finances of both Germany and the countries that were owed reparations by Germany.[10] With the collapse of the German mark during 1923 and the relief from reparations provided Germany 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, as Table F2 shows.[11] The big financial question for French governments was how much of its outstanding debt would be paid off or honored by channeling increased tax revenues to bondholders, and how much would be defaulted on through depreciation of the franc.

The period from 1924 through July 1926 was marked by political instability and a rapid succession of governments and finance ministers in "the waltz of the portfolios". There were repeated and unsuccessful attempts to deal with the increasing difficulties associated with refinancing the massive government debt as it gradually became due. The controversy was

tainted by scandal as it was revealed that the government under Herriot had cooperated in an accounting subterfuge that concealed the fact that the Bank of France had exceeded the legal limit on the amount of its note issue that could be used to purchase government bonds. The period was also characterized by a massive flight of French capital abroad, partly an anxiety reaction to some of the tax proposals under discussion, such as a capital levy, and partly a reaction to the deteriorating prospects for the returns of franc - denominated assets.

Raymond Poincaré was a fiscal conservative, who had raised taxes while Prime Minister in 1924, and was known to advocate a balanced budget and France's return to gold. In 1926, he served as his own Finance Minister. As soon as he assumed control of the government, and even before his program was enacted by the legislature, the franc recovered and inflation stopped. Under Poincaré, taxes were raised with an eye toward assuring persistent balanced or surplus government budgets. Some direct tax rates were actually reduced, including the highest rate for the general income tax, from 60 to 30 percent, and the rates of inheritance and estate taxes. However, indirect taxes were raised markedly. The Government was authorized to raise all specific taxes up to six times their prewar rates,[12/] and decrees were issued implementing this authority. Customs duties were raised, and postal rates increased, as were taxes on passenger and freight rail service and on autos. The basic income tax rates were also raised - for example, from 12 to 18 percent on income from land and securities, and from 7.2 to 12 percent on labor income. A once-and-for-all tax of 7 percent on the first sale of real estate or a business, a kind of capital levy, was also imposed.

There was also established an independent special fund to pay off outstanding government debt, administered by the Caisse d'Amortissement, a newly created agency independent of the Treasury and with its own earmarked revenues from the tobacco monopoly, the total receipts from the inheritance and estate taxes, and the new 7 percent tax on first sale of real estate and businesses.

As the figures in Tables F1 - F2 show, these measures resulted in a sudden recovery of the franc and a cessation of inflation. The franc was permitted by the French authorities to appreciate from July until December, at which time France de facto returned to the gold standard. The appreciation of the franc was accompanied by open-market purchases of foreign assets by the French monetary authority as French citizens repatriated capital in response to Poincaré's policies. While Poincaré himself had wished to restore the franc to its prewar par, it was decided to halt the appreciation of the franc in December 1926 and de facto to return to gold at that rate. This amounted to an 80 percent depreciation of the franc from its prewar par. This magnitude indicates the substantial extent to which France had financed the war by issuing bonds to its citizens on which it largely eventually defaulted. This is to be contrasted with the situation in England, which returned to the prewar par in 1925, thereby indicating an intention not to default on its long-term debt. However, the French did not default as thoroughly as did the Austrians or the Germans.[18/]

The stabilization of the French franc was followed by several years of high prosperity. The French stabilization thus seems to fit the predictions of the rational expectations equilibrium approach. To the extent that it does fit, one reason is probably the high degree of political

and intellectual consensus that prevailed at the time. It should be remembered that the French stabilization occurred after a variety of neighboring countries had successfully stabilized by resorting to the same budgetary principles that France eventually applied. At the time there was widespread professional consensus about the general budgetary situation that would have to prevail in order for the franc to be stabilized in the absence of exchange controls. Shirer indicates the degree of political consensus when he reports that "Frenchmen became obsessed with the idea that the 'Poincaré franc', shrunk though it was, must never again be devalued lest they be ruined anew," Shirer [41, 166].

The French stabilized the franc by de facto returning to the gold standard. This amounted to standing ready to convert the demand and longer term debt of the French government into gold on specified terms, e.g., on demand for currency. In order to make a domestic currency freely convertible into gold, or into any foreign money for that matter, it is necessary that the government run a fiscal policy capable of supporting its promise to convert its debt. What backs the premise is not only the valuable stocks of gold, physical assets and private claims that the government holds, but also the intention to set future taxes high enough relative to government expenditures.

This method of stabilizing a currency remains available to a "small country" today, even though the world is no longer on the gold standard. One country, call it the domestic country, can obtain a domestic rate of inflation no greater than, and even less than that of a "large" foreign country to whose currency it pegs its own currency.[14] To support this policy requires that the domestic country abstain from, or at least much restrict the extent to which it resorts to inflationary finance. Indeed,

the domestic government collects seigniorage only to the extent that it engages in clever devices such as holding its reserves of the foreign currency - denominated assets in the form of interest-bearing assets, while at the same time adopting legal restrictions and fostering institutions that prompt its own residents to hold currency and other zero or low nominal interest assets. It is possible for a domestic government actually to experience a lower rate of inflation than the country to which it pegs its currency if it sets things up so that government and private institutions back their monetary liabilities with interest-bearing foreign denominated assets, and also pass the interest returns to their depositors. In so doing, the government completely abstains from using inflationary finance, and provides domestic residents with a higher real rate of return on "money", that is, a lower rate of inflation, than is experienced by residents of the foreign country who happen to be holding currency and other zero nominal rate of interest assets.[16/]

As we turn our attention to Mrs. Thatcher's actions, it is useful to keep in mind a number of characteristics of the French financial crisis of 1926 and the subsequent salvation of the franc by Poincaré. These characteristics include:

(a) The extent to which the large interest-bearing French government debt created during the war and the reconstruction period became more and more difficult to refinance, thereby generating increasing pressures for its eventual monetization. This pressure eventually led to fraudulent accounting practices by the Bank of France and a scandal that brought down a government. The forces underlying these events are pertinent in Britain and elsewhere today in estimating the likely consequences and even the very feasibility of policies that propose to combat inflation with restrictive monetary policies alone, while at the same time permitting substantial government deficits to continue.

(b) The manner in which France stabilized by pegging the franc to a foreign currency and adopting changes in tax and expenditure laws that delivered the prospective budget surpluses needed to support that peg without exchange controls. A similar course was available to Britain in 1979, but it did not choose to follow it.

(c) The sense in which the preconditions for a successful and relatively costless stabilization along the rational expectations equilibrium model were met in France in 1926. Whether these preconditions are met is in large part a consequence of historical circumstance. However, they are also perhaps partly a function of the particular lines along which a stabilization is sought. For example, it is arguable that pegging to a foreign currency is a policy that is relatively easier to support and make credible by concrete actions, since it is possible to hook the domestic country's price expectations virtually instantaneously on to the presumably exogenous price expectations process in the foreign country.

(d) The fact that France chose to stabilize at a value that was widely believed to undervalue the franc. To this the French prosperity of the late 1920s has often been partly ascribed.[18/] This is to be contrasted with the situation in England today, in which contemporary monetary and fiscal policies have permitted a substantial appreciation of the pound, with consequent depressing influences on export industries.

3. The British Experience

Tables E1 - E13 report statistics that summarize the recent behavior of United Kingdom aggregates. Since Mrs. Thatcher took office in June of 1979, much of the news has been bad. Real GNP has declined (Tables E1 - E2); industrial production, especially in manufacturing, has fallen precipitously (Table E3); the unemployment rate has climbed from around five percent in

June of 1979 to over ten percent in March, to attain its highest level since the 1930s (Table E4); meanwhile inflation in the retail price index accelerated for the first year of Thatcher's administration, though in the last nine months it has receded markedly so that the inflation rate in the United Kingdom during this more recent period was actually less than it was in the United States (Table E6). The pound sterling rose vis-à-vis the U.S. dollar, from 2.11 \$/£ in June 1979 to 2.40 \$/£ in January 1981, while the balance of payments in current account swung towards surplus (Table E7). Interest rates rose to very high levels (Tables E12 - E13).

Recent economic events in Britain have been well summarized in recent papers by Meltzer [30] and in the Morgan Guaranty Trust Survey [31]. I refer the reader to those sources for many interesting details and will devote most of my space to highlighting and interpreting a few of the facts from the viewpoint of rational expectations macroeconomics.

4. Mrs. Thatcher's Plan

A hallmark of Mrs. Thatcher's publicly announced economic strategy is gradualism. For the most part, her government did not propose to execute any abrupt or discontinuous changes in aggregate government variables such as tax collections, government expenditures, or the money supply. Instead, the Conservatives proposed to carry out a preannounced and gradual tightening of monetary and fiscal policy over a five-year period. These intended goals were embodied in the "medium term financial strategy" (MTFS) which the new government announced in 1979. The plan included the following elements:

(1) A gradual reduction in the rate of growth of the "money supply" over a five-year period. The monetary aggregate that was chosen as the monetary instrument variable was "sterling M3" or "£M3" which corresponds to currency plus

sterling denominated demand and time deposits of United Kingdom commercial banks. The initial plan called for £M3 to grow annually at a nine percent rate in 1980 - 81, with its rate of growth gradually to decline to six percent by 1983 - 84.

(2) A reduction in the real value of government spending within four years to a level five percent less than the level in 1979 - 80.

(3) A public sector borrowing requirement (PSBR) of £8.5 billion in 1979 - 80, and £7 billion in 1980 - 81, (both in 1978 - 79 prices). Even these borrowing requirements, reduced though they were from those projected under the previous Labor Government's policies, represent deficits that as a ratio to GNP are several times those experienced in the United States.

Other elements of the government's plan were executed immediately. These included reductions in marginal income tax rates ranging from 33 percent to 30 percent for the lowest brackets to from 83 percent to 60 percent for the highest brackets, and substantial increases in the taxes on consumption, most notably a substantial increase in the Value Added Tax (VAT). This change in tax structure was made with an eye toward increasing the rate of saving. In addition, in October 1979, exchange controls were removed, so that for the first time since World War II, residents of Britain were permitted freely to invest abroad. The government committed itself to flexible exchange rates with neither current nor capital account exchange controls, nor substantial government open market operations in foreign assets designed to peg or influence the exchange rate. In line with the theme of deregulation, the government permitted the "Special Depository Regulations", widely known as the "corset" to expire. These regulations had

directly limited the extent to which the banks could increase their interest-bearing deposits. The corset represented an attempt directly to influence the £M3 aggregate, and was widely and correctly believed to distort the interpretation of the £M3 figures, as depositors moved into close substitutes for £M3 in response to the restrictions.

In its conception, and even more so in its execution, the plan incorporates central aspects of monetarism. The key monetarist plank is embodied in the use of gradual reductions in a measure of the money supply, sterling M3, as the central vehicle for reducing the rate of inflation. These reductions in the money supply are recommended despite very large planned budget deficits, planned deficits that in the actual event have been overrun. A keystone of monetarist doctrine is that even in the face of persistent government deficits, by managing the money supply properly the government can avoid inflation.[17] Referring to England's recent experience, Alan Meltzer has recently put the case as follows: "Excess public spending, larger than expected budget deficits and the growth of money in excess of targets are related problems. The relation would disappear if the central bank changed its operating procedures and permitted market rates to fluctuate as much as is required to control money. The excess deficit would then be financed by domestic saving or by foreigners, but money growth and inflation would fall."[18]

There are various possible interpretations of this argument, not all equally credible. On one rational expectations interpretation, by restricting itself now and forever to a binding "k - percent growth rule"[19] for the monetary base, the government effectively limits the extent to which it will collect seigniorage by resorting to inflationary finance now and in the future. Under rational expectations, current government budget deficits - expenditures

net of both explicit taxes and seigniorage - must be balanced by prospective government surpluses in the future. That is, additional government bonds will be valued according to the same principles that give bonds of private corporations value: their real prospective returns. Ultimately, these prospective returns are represented by the government's willingness to tax highly enough in the future. On this view, a "k - percent rule" for the monetary base plays a similar role as a "gold standard" rule, in the sense that it places a limit on the time path of real government deficits. Both the "k - percent" rule and the "gold standard" rule in effect require that if the government is to sell its debt, the expected present value of the current and prospective government surpluses must be positive. Each rule permits the government to run deficits, even a number of deficits in succession, but these deficits must be accompanied by prospects that eventually the government budget will turn to surplus in sufficient amount to outweigh the deficits. This interpretation of the "k - percent" rule is one that is compatible with the Barro-Ricardo result about the equivalence of bond and tax financing.[20/] On this interpretation, a "k - percent" rule is not compatible with an everlasting government deficit, but only with a deficit that is temporary in the appropriate sense.

In my view the preceding interpretation of the relationship of a "k - percent" rule to the budget deficit is the correct one. As with most rational expectations lines of thought, that interpretation emphasizes the dynamic or intertemporal features of the process, and the constraints that a "k - percent" rule requires on the future time path of the government deficit.

There is an alternative, and I believe defective view that seems to assert that a "k - percent" rule is compatible with a more or less permanent deficit. This view is based on reasoning from standard Keynesian or monetarist models without rational expectations. Versions of those models exist in which the government can control inflation by sticking to a "k - percent" rule for the monetary base given an unrestricted path for the deficit.[21/]

The preceding argument raises questions about the credibility of an announced plan to lower the monetary growth rate and to move to a "k - percent" rule, while simultaneously projecting substantial government budget deficits for the several years in the immediate future. The doubtful credibility of such a plan stems from the fact that a large permanent real government deficit is simply incompatible with a "k - percent" rule for the monetary base. A minimal requirement that a plan be credible is that it be feasible in the first place. As we have argued, a restrictive "k - percent" rule for the base and a permanent and large government deficit just aren't feasible. On this view, in order that the current British plan be viewed as credible it is necessary that the large prospective government deficits over the next several years be counterbalanced by prospective surpluses further down the line. It is difficult to point to much either in current legislation or, equally important, in the general British political climate that could objectively support such an outlook. On this view, the large government deficits that have accompanied the government's medium term financial strategy raise serious questions about whether the plan has the logical coherence that is necessary for the plan to be credible to the public.

Samuel Brittan has recently drawn attention to a closely related issue. At the same time that the government has touted its determination to bring inflation permanently down through monetary restraint, the substantial government deficits have been financed by issuing large amounts of nonindexed long-term government debt at nominal yields to maturity ranging between 13 and 14 percent. Attention is directed to Tables E11 and E12. Table E11 indicates the substantial extent to which the government has been financing its deficit by selling additional long-term government debt. Thus, in financial year 1979 - 80, most of the additional government debt was over fifteen years in maturity. Now if the government were actually to deliver on its hope permanently to reduce the inflation rate, it would imply substantial increases in the real value of the long-term government debt and the real value of the interest payments on the debt. For example, investors who purchased debt at nominal rates of 14 percent while expecting average inflation of 12 percent and a real return of two percent[22/] would experience ex post real yields higher than two percent precisely to the extent to which realized inflation falls short of the 12 percent inflation rate that they had expected. For the same reason, but in the other direction, governments in the past have sometimes given way to the temptation to default on part of their interest-bearing government debt by causing inflation to occur at a higher rate than was anticipated at the time that the debt was sold.[23/] This same incentive confronts the government now, and raises suspicions about the current and future governments' commitment permanently to lower the inflation rate. According to this argument, a government intent on eradicating inflation has a strong incentive to finance its deficit and refinance its outstanding debt by issuing indexed government bonds. This

would isolate it from any increase in the real value of the burden of the debt once inflation is lowered. This the British government has not done to any significant extent.

For advocates of "Irving Fisher's effect", Table E12 contains an important piece of evidence about the public credibility of Mrs. Thatcher's plan for reducing inflation over the longer run. The term structure of interest rates on government bonds is high and fairly flat, suggesting that the market expects the continuation of high inflation rates on a sustained basis.

As emphasized earlier, in the rational expectations view, these matters of coherence and credibility are very important in determining the likely effects of a program on real variables such as output and employment. If a program is constructed in a fashion that makes private agents believe that its execution is uncertain, then, even if preannounced, restrictive monetary policy actions can easily produce substantial reductions in output and employment.

5. The Outcome of the Plan So Far

Having described the government's anti-inflation plan and some possible reservations about it, I shall now proceed briefly to describe how events have actually unfolded. First, sterling M3 has exceeded its target range, despite the fact of a restrictive minimum lending rate (MLR), and a basically tight open market stance. For example, the fiscal year 1980 - 81 target range for £M3 of 7 - 11 percent per year is to be compared with the annual rate of increase in £M3 of 21 percent between February 1980 and February 1981. During the same time period, sterling M1 - currency plus demand deposits - increased by only 8 percent. Despite the overshooting

of £M3, British interest rates have been very high, making many commentators of Keynesian inclination believe that monetary policy is very tight. Second, the public sector borrowing requirement has overrun its target. The 1980 - 81 PSBR had been forecast in the government's 1980 budget as £8½ billion, or 4½ percent of GDP, while it is now expected to be around £13½ billion or 6 percent of GDP. I shall comment in turn on the overshooting of each of these targets.

5a. Overshooting the £M3 Target

There have been several reactions to the overshooting of the £M3 target.[24/] One has been to argue that since the overshooting reflects mainly a response to removal of the distorting effect of the corset, it does not indicate a failure to pursue a tight monetary policy. As evidence in support of this position, the relatively slow growth of £M1 is often cited. Another response has been to criticize the Bank of England's operating procedures for focusing too heavily on interest rates as an intermediate instrument. Allan Meltzer [30] takes this line in arguing that by pegging interest rates, the British monetary authority necessarily gave up direct control over monetary aggregates and allowed them to be market determined.

The analytics of using monetary aggregates as opposed to interest rates as the monetary instrument have been characterized in Martin Bailey's book [2] and in papers by William Poole [34] and John Kareken [24]. The case for superiority of a particular monetary aggregate over a particular interest rate depends on the demand schedule for that monetary aggregate being less uncertain than is the aggregate demand schedule expressed as a function of that particular interest rate. Other things equal, factors which contribute to uncertainty about the demand for a given monetary

aggregate diminish the relative merit of using that aggregate as the monetary instrument.

This analytical argument is quite pertinent in evaluating the controversy about the overshooting of the £M3 target (and also about the appropriate monetary instrument for the United States in 1981). The removal of the corset and the dismantling of exchange controls at the outset of Mrs. Thatcher's administration presumably shifted the demands for a whole host of assets in historically unprecedented and uncertain ways. Regardless of the possible merits of the case for relaxing these controls, it seems clear that for some time after they are relaxed the interpretation of a variety of monetary aggregates becomes more uncertain and difficult than it had been. During such periods, the case for using an interest rate rather than a monetary aggregate as the monetary instrument becomes substantially strengthened. It is ironic that both in the United Kingdom and the United States,[25/] the accession of monetarists to a dominant influence over policy has coincided with substantial revisions in the structure of financial regulations that at least temporarily cloud the meaning of the particular monetary aggregates that they favor controlling. It seems to me that it is a defensible view that despite their own problems of interpretation, the high nominal interest rates in Britain over the last year (see Table E13) have more appropriately signalled the stance of monetary policy than any particular monetary aggregate.[26/]

5b. The Government Deficit

I now turn to discuss the behavior of the public sector borrowing requirement, which so far has exceeded the government's target by so much

that the government has moved to correct the situation by raising taxes. The 1980 - 81 PSBR which had been forecast by the government to be £8½ billion or 4½ percent of GDP, appears to be coming in at £13½ percent or 6 percent of GDP. In the March 1981 budget the Chancellor of the Exchequer, Sir Geoffrey Howe, announced a number of tax increases designed to reduce the prospective (PSBR) for 1981 - 82 to about £10½. Without those additional tax measures, the government estimated that the 1981 - 82 PSBR would have been about £14½ billion. The new revenue raising measures included increases in the excise taxes on drink, tobacco, petrol, diesel road fuel, cigarette lighters, matches, and road vehicles. The extent to which income tax payments were indexed against inflation was reduced. A Supplementary Petroleum Duty on North Sea oil and gas was announced which together with adjustments in the Petroleum Revenue Tax, is expected to yield about £1 billion. The Chancellor also announced a once-and-for-all tax on low-interest bank deposits that is expected to yield £.4 billion in 1981 - 82.[27] The government announced these tax increases because it has become increasingly aware of the threat that a persistent and large government deficit sooner or later poses to an anti-inflation policy based on monetary restraint.

Before considering the nature of the British deficit in more detail, it helps to remember a few analytical principles about government finance. In interpreting reported figures on the government's budget deficit, it is useful to keep in mind the hypothetical distinction between "current account" and "capital account" budgets and their deficits. A pure current account expenditure is for a service or perfectly perishable good that gives rise to no government-owned asset that will produce things of value in the

future. A pure capital account expenditure is a purchase of a durable asset that gives the government command of a prospective future stream of returns, collected for example through user charges, whose present value is greater than or equal to the present cost of acquiring the asset. A pure capital account budget would count as revenues the interest and other user charges collected on government-owned assets, while expenditures would be the purchases of capital assets. On these definitions, government debt issued on capital account is self-liquidating and fully backed by the user charges that are earmarked to pay it off. Government debt issued to finance a pure capital account deficit is thus not a claim on the general tax revenues that the government collects through sales and income taxation. The principles of classical economic theory condone government deficits on capital account. The idea is that certain government capital projects are worthwhile on cost-benefit grounds, and that it is reasonable to finance them by levying taxes throughout the time the benefits accrue, and on whom the benefits of the project accrue. In short, so far as capital account deficits are concerned, there is a sense in which a government is like a firm, it being wise to borrow in order to finance worthwhile long-lived projects with taxes and other user charges whose stream over time matches the time profile of the benefits.

A deficit on current account is very different because it is not self-liquidating. The classical economic doctrine was, first, that the current account budget should always be balanced, and second, on those extraordinary occasions such as wars when it could not be balanced, that a current account budget deficit should be financed by long-term debt and a plan to run current account surpluses in the future sufficiently large to retire the debt. Thus, a current account deficit, should it be

unavoidable was to be financed by "earmarking" some future general tax revenues for the purpose of retiring the debt.

It is no coincidence that these classical doctrines about government finance were developed at a time when England and other leading economic powers were on the gold standard, each government promising to convert its currency and other government debt into gold on certain specified conditions. To make good on that promise, a government had to "back" its debt with sufficiently large and sufficiently probable prospective government surpluses denominated in gold. Deficits on capital account did not threaten a government's adherence to a gold standard, while deficits on current account did. The force of a gold standard was to cause the government to back its debt and to refrain from raising revenues from seigniorage.

Under contemporary monetary institutions, in which currency is inconvertible or "fiat", governments have access to seigniorage as an additional means of raising government revenues. (Whether the additional freedom this gives government is helpful is very controversial both among theorists and practical people.) When a government finances its term debt without indexing repayment to the price level, the freedom to expand government demand debt and longer term debt without the limits imposed by adherence to the gold standard gives the government a wide range of options about if, when, and to what extent to default on its long-term debt by monetizing it and depreciating its real value.[38/]

Under a fiat money regime, the extent to which a current account deficit is inflationary depends on the extent to which private agents believe that the government will ultimately finance it by monetization.

For example, the Ricardo-Barro doctrine about the irrelevance of the current taxation - debt issuing choice assumes that the government refrains from monetizing the debt and in effect binds itself to a classical financial policy. Under that policy, current real government deficits are not inflationary because they are accompanied by expectations of future government surpluses. The additional real government debt is backed by prospective real tax revenues. However, as Bryant and Wallace [9] have emphasized, in a policy regime in which the current deficit is eventually monetized in some proportion, a current account deficit is inflationary. In some models, it is more inflationary the larger the proportion of it that is eventually monetized and the sooner the monetization occurs. In those models, the precise dynamics by which the prospect of future monetization of the debt influences inflation rates depends on the detailed specification of the demand functions for assets, in particular, on how responsive they are to the expected rate of return on currency. It can readily happen, for example as under a demand function for money like Phillip Cagan's [11], that <u>current</u> rates of inflation respond positively to the prospect of <u>future</u> increases in money brought about by eventual monetization of government debt (see Sargent and Wallace [38]).

Although it seems not to have been something that Keynes himself would have advocated, the widespread adoption of Keynesian ideas about fiscal policy after World War II has been accompanied by abandonment of the classical public budgeting and accounting procedures at the level of national governments (although not at the level of state and local governments in the United States). For example, in the United Kingdom the nationalized industries do not float their own debt. Instead, they borrow from the National Loan Board, which in turn borrows by issuing government debt. This arrangement is one that departs from or at least

obscures the "earmarking" of revenues from particular projects to back a given bond issue. Moreover, the recent history of public finances in the United Kingdom displays little sensitivity to the capital account - current account distinction. For example, as Table E5 and figure 2 , show, capital formation by the general government and nationalized industries has stagnated or actually fallen. Further, as Table E9 shows, while general government final consumption and current grants and subsidies have risen substantially in recent years, and have continued to rise under Mrs. Thatcher, capital expenditures have not. Under both Mrs. Thatcher's government and the previous Labor Government, belt-tightening has fallen largely on public sector investment items. According to the classic canons of public finance that we alluded to earlier, this structure of expenditure cuts is perverse from the viewpoint of anti-inflationary policy.

The failure of Mrs. Thatcher's government to control public expenditures has been widely commented upon, and will receive only brief mention here. Mrs. Thatcher has been criticized for a number of what are essentially tactical errors, for example, in her stance toward pay for public employees. Her early decision to stand by the Conservative Party's campaign pledge to honor the recommendations of the Clegg Commission, which the Labor Government instituted to establish pay standards for civil servants comparable to those in the private sector, resulted in earnings increases for civil servants of 24½ percent between 1979 III and 1980 III . Thatcher responded, albeit belatedly to that criticism, by eventually abolishing the Clegg Commission in the fall of 1980. Since that time, the government has announced the adoption of a "cash limit system", which essentially creates a "total wages fund" with which the government intends to confront a given public sector union or collection of unions. The idea is to force

the unions to take into account a trade-off between wage rates and the number of public sector employees. A problem is that such cash limits have been breached in the past and have already been breached by Thatcher in the coal miners' settlement.

6. North Sea Oil and the Pound Sterling

In the late 1970s, the magnitude of Britain's prospective revenues from North Sea oil became clearer, and coincided with a simultaneous appreciation of the pound sterling from 1.65 U.S. $/£ in 1975 IV to 2.39 $/£ in 1980 IV, and a swing of the current account balance of payments from a deficit toward surplus. The fact that Great Britain moved from being a net importer to being a net exporter of petroleum helped swing the current account into surplus. Some observers have attributed the strength of the pound to Britain's claim on North Sea oil and its contribution in swinging the current account toward surplus. However, few macroeconomic models imply that there is any direct connection between possessing oil and having a strong currency. There is an indirect connection, namely that North Sea oil is heavily taxed and thus contributes to prospective government revenues, thereby tending to diminish the government deficit. Revenues from the taxation of North Sea oil are substantial, and are expected to grow over time. The 1981 budget forecasts revenues from all taxes on oil (in 1979 - 1980 prices) of £3.25 billion in 1980 - 1981, £4.50 billion in 1981 - 1982, £4.75 billion in 1982 - 1983, and £5.25 billion in 1983 - 1984. These revenues are a substantial fraction of the current government deficit of £13.5 billion. However, most macroeconomic theories assert that it is only the total deficit and how it is financed that influences both inflation and the international

value of the pound. So long as total prospective government deficits remain as large as they are, it is difficult to subscribe to the view that the United Kingdom's possession of oil is what strengthens the pound. As a scrap of empirical evidence supporting this judgment, it has been observed that Norway is in a similar situation to England vis-à-vis North Sea oil, and that neither has its currency appreciated internationally nor has it experienced the severe depression of industry that England has. One explanation for the difference appears to be that Norway has embarked on a looser monetary policy than has England.

Another popular explanation for the strong pound is that OPEC countries have begun to diversify their overseas investments by holding assets denominated in a variety of foreign currencies, and that this has resulted in an increased preference for pound-denominated assets. This factor is probably part of the explanation, but is not the dominant force leading to a strong pound.

Probably the most plausible explanation for the emergence of a strong pound builds on the "overshooting" idea of Dornbusch,[29] and has the advantage that it simultaneously explains other aspects of the current situation including high British interest rates and depressed British output and employment. Dornbusch modeled a small country under the following assumptions: (a) The domestic price level has some sort of "stickiness". Either domestic prices are exogenous, as in one of Dornbusch's original formulations [12], or there is a Taylor-like long-term contracting mechanism, as in a later contribution by Dornbusch [13], or there are information discrepancies à la Lucas and Phelps that prevent domestic prices from adjusting instantaneously to certain classes of random events, as in the setup of Nasser Saidi [36]. Which of these devices is resorted

to makes an important difference, as we shall see. (b) There is assumed to be perfect international capital mobility in high yielding assets. This implies that the "interest parity condition" must hold. The interest parity condition states that "the" domestic interest rate must equal the foreign rate of interest minus the expected rate of appreciation of the domestic currency. Thus, letting r_{jt} be the domestic nominal interest rate on j period bonds, r^*_{jt} be the foreign nominal interest rate on j-period bonds, e_t be the exchange rate or domestic price of foreign money, measured in domestic currency per unit of foreign currency, and $E_t \log e_{t+j}$ be the logarithm of the exchange rate expected as of time t to prevail at time $t + j$, the interest parity condition is

$$r_{jt} = r^*_{jt} + \frac{1}{j}\{E_t \log e_{t+j} - \log e_t\} \quad .$$

The interest parity condition insures that foreigners can attain the same nominal rate of return, in terms of their own currency, by investing in the domestic country as by investing elsewhere. (c) The market for domestic currency and other "money" is assumed to be isolated internationally in the sense that the real rate of return on domestic money is permitted to be strictly dominated by other assets including domestic and foreign bonds and equities, and maybe also foreign currencies. What is crucial for the results is that there be some restriction on the scope of international currency substitution, most formulations ruling out any currency substitution at all. Notice the asymmetry between the assumption of integrated world bond and equities markets, but nationalistic markets for currencies. The demand for domestic real balances is assumed to vary inversely with the domestic nominal interest rate, and directly with domestic and real output, in the standard way. (d) The demand for domestic real output

depends, among other things, inversely on both the domestic real rate of interest and on the "real exchange rate" or terms of trade. Thus, letting p be the domestic price level measured in pounds per British good, p^* the foreign price level measured in dollars per United States good, and e the exchange rate measured in pounds per dollar, the "real exchange rate" is defined as ep/p^*. Thus, given p and p^* an increase in e decreases the demand for British output, since it raises the relative price of British goods in terms of United States goods. (e) While the domestic price level is to some extent sticky, the exchange rate and domestic interest rate are perfectly flexible instantaneously. (f) The foreign price level and interest rate are exogenous to events in the domestic country, the operational meaning of the "small country" assumption. (g) Expectations are rational.

Given these assumptions, consider a situation in which the British monetary authority undertakes a restrictive monetary action. Because of price level stickiness, the initial effect is to drive the domestic interest rate upward. But the upward tendency in the domestic interest rate threatens to disturb the interest parity condition and to create a capital inflow. To maintain interest parity in the face of less than perfectly flexible prices, the entire expected exchange rate path must adjust to generate an expected path of subsequent depreciation of the pound sufficient to offset the higher British interest rate. In order for this to happen, the exchange rate e must first jump <u>upward</u> to a higher level than before the restrictive monetary action, from which higher level it gradually falls in order to generate the rational expectations of a depreciating pound needed to maintain interest parity. Thus the immediate effect of the restrictive monetary action is to cause

the exchange rate initially to appreciate suddenly, and only subsequently to depreciate gradually. However, since the domestic price level is somewhat sticky, the initial effect of the appreciated pound is to raise the real exchange rate $e\,p/p^*$, and so to reduce the demand for British goods. This effect reinforces the effect on demand of the higher real domestic interest rate and leads to a recession along standard Keynesian lines of insufficient aggregate demand.

This sequence of events depends on there being some source of price stickiness that prevents the domestic labor market from clearing. Had domestic prices and wages been assumed perfectly flexible, the response to a downward movement in the domestic money supply would have been very different than that described above. In particular, under flexible prices, equilibrium is restored by a drop in the domestic price p proportional to the drop in the money supply, together with an offsetting increase in the exchange rate just sufficient to leave the real exchange rate $e\,p/p^*$ unaltered. No changes in the domestic interest rate or output are needed to restore equilibrium. A version of classical neutrality occurs in these models under flexible domestic prices.

Versions of the model such as Saidi's that rest on limited information and temporary confusion to provide price stickiness, or a Phillips curve, exhibit an interesting mixture of the responses under sticky prices and under perfectly flexible prices. In particular, with respect to monetary disturbances that were perfectly predictable given private agents' information and understanding in the past, the system responds exactly as if prices were perfectly flexible: there are no "real" effects, the domestic price level and the exchange rate adjusting just enough to offset the disturbance while leaving domestic real output and employment unaltered. However, with respect to monetary disturbances that are not

predictable, given agents' information and understanding, the system responds qualitatively in the same fashion as described above when prices are sticky.

Each of these variants of the Dornbusch model works in explaining the broad features of recent British experience, including high nominal interest rates, a strong pound sterling, and depressed industry. However, the different versions of the model support different interpretations and perhaps also policy recommendations.[30/] On the one hand, according to the models that rely on momentum or long-term contracts to generate domestic price inflexibility, the response to restrictive monetary actions will be qualitatively similar whether or not those actions were foreseen by private agents. Such versions of the model could explain events even on the interpretation that Mrs. Thatcher's restrictive actions represent execution of a once-and-for-all regime change that is widely believed and irreversible. On the other hand, according to versions of the model like Saidi's that rely solely on information limitations to induce a Phillips curve, the events must be interpreted as reflecting the perceived temporary and reversible nature of the restrictive monetary actions that the government has undertaken.

Explanations along the preceding line seem to be the best ones available for simultaneously explaining the strong pound, depressed British industry, and persistent British inflation. However, the recent literature on currency substitution makes it clear that this argument is delicate in that it depends on a demand function for domestic currency that permits domestic currency to be dominated in rate of return by large and variable amounts by foreign currencies and other assets. As several researchers have emphasized,[31/] there are incentives for international

currency substitution that threaten the temporal stability of the demand schedule for domestic currency and the durability of the preceding class of explanations. The literature on currency substitution points toward a problem that may loom on the horizon for British policy. That literature predicts that a country that runs a much larger persistent deficit than its neighbors and that monetizes a large fraction of it will require the imposition of international currency controls if it is to support its currency internationally.[32/] The models analyzed in the currency substitution literature thus indicate that high and persistent government deficits are over the long haul incompatible with permanent abstention from exchange controls. While it might take some time for these forces to break through various frictions, they will acquire strength and create problems precisely to the extent that a large budget deficit looms in the future. It is certainly arguable that only temporarily can a tight monetary policy delay the operation of these forces, à la Dornbusch, in the face of a large and persistent government deficit.

7. Conclusion

The theoretical doctrines and the historical evidence described in this paper provide little reason for being optimistic about the efficacy of a plan for gradual monetary restraint which is simultaneously soft on the government deficit. Gradualism invites speculation about future reversals or "U - turns" in policy. Large contemporary government deficits unaccompanied by concrete prospects for future government surpluses promote realistic doubts about whether monetary restraint must be abandoned sooner or late to help finance the deficit. Such doubts not only call

into question the likelihood that the plan can successfully permanently reduce inflation, but also can induce high real costs in terms of depressed industry and lengthened unemployment in response to what may be viewed as only temporary downward movements in nominal aggregate demand that the monetary restraint induces.

These considerations are pertinent in assessing the state of the United Kingdom's economy today and the situation facing the French in the 1920s. They are also pertinent in evaluating the wisdom of passing Kemp-Roth in the United States while simultaneously planning to implement a tight k-percent monetary rule.

If we are bent on reducing inflation, then by consulting both our theoretical imaginations and history, we can find methods that improve on gradualist monetary restraint in the face of large government deficits. That is why it behooves us to recall Poincaré and his contemporaries even as we think about Thatcher.[33]

Footnotes

1/ For example, see Otto Eckstein [14].

2/ For example, see Lucas [25], Barro [3], Sargent and Wallace [37], and McCallum [29].

3/ Robert Barro [5] has pointed out that after a change in policy regime, it can happen that it is in the interests of neither party to enforce some long-term contracts of the Taylor-Fischer variety that had been agreed upon before the regime change. Presumably such contracts would never be enforced.

4/ Leland Yeager summarizes British postwar macroeconomic policy as follows: "The rapid reversibility of British policy . . . has been almost comical at times. Balance-of-payments troubles have brought a variety of *ad hoc* responses, including two devaluations and one abandonment of exchange rate pegging, the selective Employment Tax of 1966, the import surcharge of 1964, the import deposit scheme of 1968, the tightening and loosening of various exchange controls on current and capital transactions, and various attempts at wage and price control, as well as turnarounds in domestic financial policy. Reliance on such expedients creates changes of improper timing, of anticipatory private actions, of overshooting the mark, and of intensified instability as a result," [44, 472].

5/ It goes without saying that the "credibility" that is essential under the rational expectations theory cannot be manipulated via promises or government announcements.

6/ Rudiger Dornbusch made this argument in oral comments on my earlier paper [39].

7/ The reader is referred to the accounts of post-World War I stabilizations in Brown [8] and Young [45]. For example, the Italian stabilization might as easily have served as our example as the French one. Brown [8, 431] quotes Count Volpi's account of the important aspects of the plan that the Italian government used to stabilize the lira:

"1. Balancing of the national budget.

2. Consolidation of war debts.

3. Unification of the note issue and its concentration in the hands of the Bank of Italy.

4. Progressive and more efficient utilization of Italian resources and raw materials.

5. Gradual deflation in currency and in credit.
6. Consolidation of the floating debt and reorganization in the Treasury Department.
7. Regulation of the influx of foreign capital into Italian industry.
8. Reorganization in the whole field of production, and readjustment of taxes with a view to increased industrial efficiency.
9. Gradual amortization of the domestic debt.
10. Defense of the Treasury surplus by the reduction of state expenditures."

Count Volpi was the "architect of Italy's return to gold."

8/ Interesting accounts of the "Poincaré miracle" appear in Shirer [41], Yeager [44], Alpert [1], Haig [21], and Rogers [35].

9/ William Shirer [41], describes this struggle.

10/ Another element of uncertainty was injected by the substantial war debts owed the United States, coupled with the French belief that the United States should not insist that these be repaid.

11/ For accounts of the effects of war debts and reparations on the public finances and currencies in Europe after World War I, see Yeager [44] and Alpert [1].

12/ See Haig [21, 163].

13/ The strength and endurance of French politicians' resolve not to repeat such a default was indicated by the fact that France was the last of the major countries to devalue its currency in terms of gold in the 1930s: France devalued in 1936, while England did so in 1931 and the United States did in 1933.

14/ Stanley Fischer [17] provides a more complete discussion of this issue and the other issues that are described in this paragraph. Bryant and Wallace [9] discuss optimal seigniorage from the viewpoint of price discrimination. They describe setups in which a government can find it worthwhile to issue an array of debt with differing yields, tailored to segments of the market with differing interest elasticities of demand for government debt. Applying

14/ Continued -

their idea to the issue in the present discussion, setups can be imagined in which the domestic country arranges to hold high-yielding foreign government debt, and in which it is in the interests of both the foreign and the domestic country to permit the domestic country to back its monetary liabilities by the higher yielding foreign government debt rather than the lower yielding debt.

15/ Bilson [7] describes a scheme of this sort that can lead to a positive real return on government issued or privately issued "currency" through a process of deflation.

16/ For example, see Yeager [44] or Alpert [1].

17/ See Friedman [18, 19, 20].

18/ See Meltzer [30].

19/ Presumably, a rule in which k is a small number.

20/ See Barro [6].

21/ In the literature it has been pointed out that such a k-percent rule implies an explosive path for the government interest-bearing debt. As Bennett McCallum [28] has pointed out, depending on the precise specification of the model, that fact may or may not imply that other variables in the model that are of interest are unstable.

22/ The recent issue of indexed bonds in England sold at a real rate of interest of about two percent.

23/ This issue was central to the struggle over the post-World War I stabilizations.

24/ From the technical viewpoint of controlling monetary aggregates, the banking and financial intermediary systems in the United Kingdom differ in important respects from those in the United States. First, in the United Kingdom banking is more concentrated, there being five main "Clearing Banks". Second, in the United Kingdom assets eligible to meet the 12½ percent reserve requirement include all of the following interest-bearing assets: money at call from discount houses, Treasury bills and other short-term government securities, local authority paper, corporate tax anticipation certificates,

24/ Continued -

and bills of exchange. Notice that some of these assets are evidences of government indebtedness, while others are private debts. Since demand deposits do not bear interest in the United Kingdom, vis-à-vis the United States system, this system of reserve requirements has the effect of tending to increase the banking system's share of seigniorage revenues relative to that of the government. On the other side of this issue, currency is a higher proportion of M1 in the United Kingdom than in the United States. Third, the building societies (the analogue of savings and loan institutions in the United States) have long issued mortgages with variable maturities and variable rates of interest both linked to the general level of market interest rates. Therefore, in the United Kingdom high interest rates do not produce the disintermediation from saving institutions that is so troublesome for the conduct of monetary policy in the United States. Fourth, partly as a result of the third feature, there is no analogue of "Regulation Q" in the United Kingdom, and small savers have access to a variety of instruments yielding close to market rates, as for example, Building Society shares. This fact also explains the absence of "money market funds" in the United Kingdom. Fifth, the Bank of England does not lend directly to the clearing banks, but instead operates a discount window for the "discount houses" that make markets and hold portfolios of short-term government and private securities. The "minimum lending rate", formerly known as the "bank rate", applies to the Bank of England's loans to the discount houses.

25/ I have in mind the Monetary Control Act.

26/ As in the United States, in the United Kingdom there is a bewildering variety of monetary aggregates. The main ones are M1, £M3, M3, PSL1 ("Public Sector Liquidity number 1"), and PSL2. The variety of aggregates is spawned by the vagueness of "means of payments" as a category setting off one class of assets as "money", Sargent and Wallace [40].

27/ Recall the remarks in footnote 24 about the way in which seigniorage is allocated between the banks and the government under the British system of reserve requirements.

28/ This was the choice that French politicians consciously faced and struggled with from 1919 to 1926, and that politicians also face today, although perhaps less consciously.

29/ See Dornbusch [12, 13]. Buiter and Miller [10] argue that Dornbusch's idea explains contemporary observations in the United Kingdom.

30/ One popular policy recommendation stemming from the momentum version of the model is to impose "inward capital controls", for example, an "interest

30/ Continued -

equalization tax" on the yields of British securities held by foreigners. Such a tax is presumed to weaken the pound and stimulate aggregate demand and real domestic output. See Buiter and Miller [10].

31/ Kareken and Wallace [23] propound a model with an extreme amount of currency substitution.

32/ See Kareken and Wallace [23].

33/ Economists have begun devoting more attention to devising ways of reducing the costs of winding down inflation. For example, Jeffrey Shaefer and Axel Leijonhufvud have recently described a kind of dynamic currency reform scheme that aims to eradicate the costs of eliminating inflation that are due to long-term contracts. To illustrate their scheme, suppose that up to date t, the monetary and fiscal policy regime and the other random processes that influence inflation have been such as to make it rational for private agents to expect that future prices will follow some given path $\hat{p}(t + j)$, $j \geq 0$, where the expected price level $\hat{p}(t + j)$ is measured as usual in units of "green dollars at time $t + j$ per good at time $(t + j)$". For example, if a constant rate of inflation of π is expected, then $\hat{p}(t + j) = (1 + \pi)^j p(t)$, where $p(t)$ is the actual price level at t. If these price expectations are built into long-term contracts that have been entered into at t and earlier, and so form a legacy that influences actual prices and quantities at times $t + j$, then the act of bringing inflation to a sudden halt will cause substantial redistributions across traders. To the extent that actual prices turn out to be less than those expected at the time that the contracts were negotiated, real output and unemployment will be adversely affected.

The idea of Shaefer and Leijonhufvud is to circumvent these costs by carrying out an imaginative kind of currency reform. The government passes a law at date t that states that all contracts that call for payment of y dollars at date $t + j$, can be discharged by paying only $y\,p(t)/\hat{p}(t + j)$ dollars. Thus, in the constant expected inflation case, dollars due at $(t + j)$ are paid off at only $1/(1 + \pi)^j$ on the dollar. Furthermore - and this is essential - the government successfully commits itself to run a fiscal and monetary policy that implies a stable price level so that the <u>actual</u> price $p(t + j) = p(t)$ for all $j \geq 1$. With a constant actual price path of $p(t + j) = p(t)$, and the new debt conversion law, both sides of all contracts end up being just as well off as if the debt conversion law had <u>not</u> been enacted and prices had risen as expected, $p(t + j) = \hat{p}(t + j)$. Thus the debt conversion law is crafted to neutralize the real affects of the monetary and fiscal policies needed to support a zero inflation price path. It is as if the government announces that it is calling in all the green-colored currency and issuing new blue-colored currency on the following terms: green dollars will be converted into blue dollars at par at time t, and subsequently the green dollar price of a blue dollar is $\hat{p}(t + j)/p(t)$.

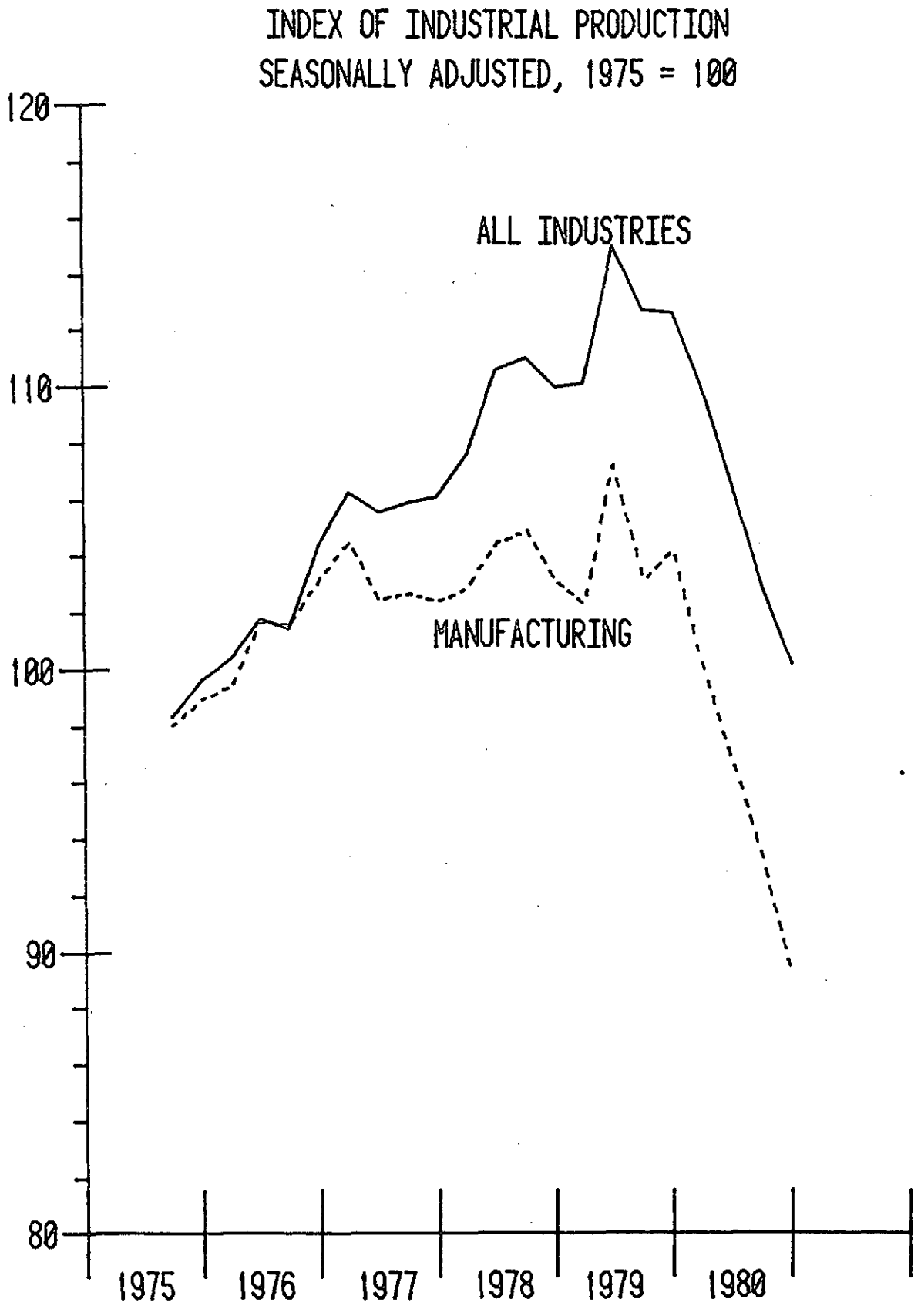
INDEX OF INDUSTRIAL PRODUCTION
SEASONALLY ADJUSTED, 1975 = 100
120
110
100
90
80
ALL INDUSTRIES
MANUFACTURING
1975
1976
1977
1978
1979
1980

Figure 1

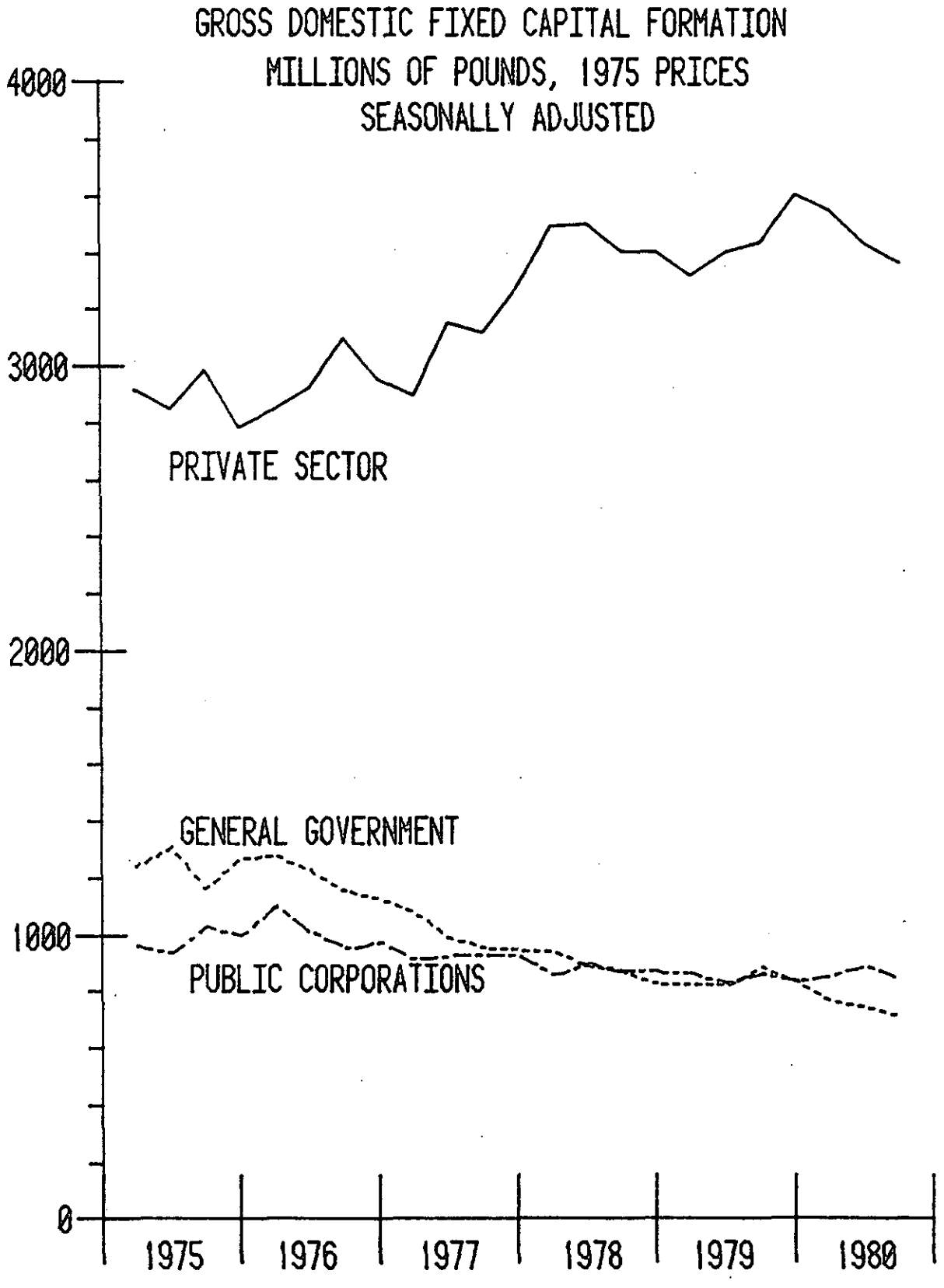
GROSS DOMESTIC FIXED CAPITAL FORMATION
MILLIONS OF POUNDS, 1975 PRICES
SEASONALLY ADJUSTED
4000
3000
2000
1000
0
PRIVATE SECTOR
GENERAL GOVERNMENT
PUBLIC CORPORATIONS
1975
1976
1977
1978
1979
1980

Figure 2

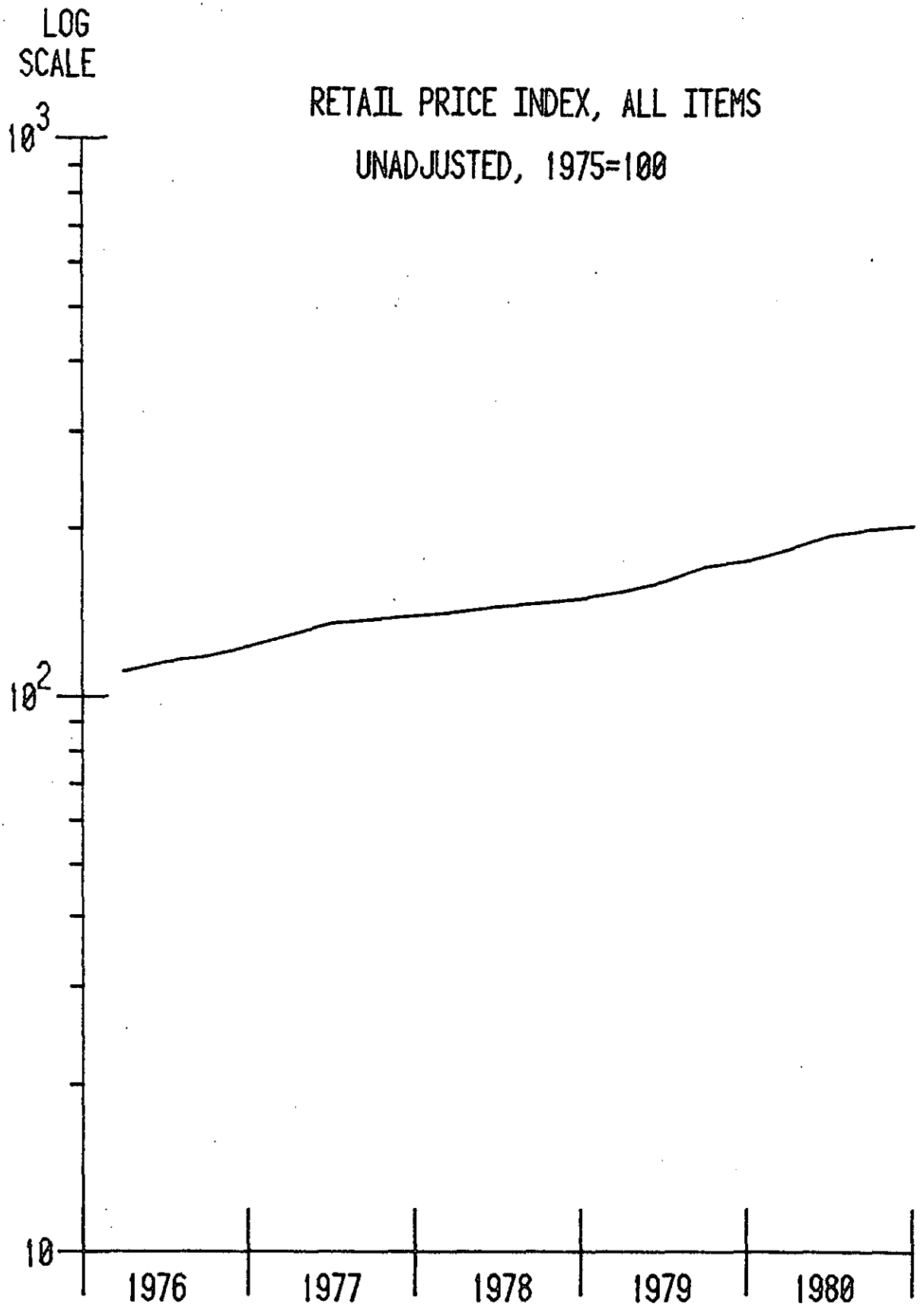
LOG
SCALE
RETAIL PRICE INDEX, ALL ITEMS
UNADJUSTED, 1975=100
10^3
10^2
10
1976
1977
1978
1979
1980

Figure 3

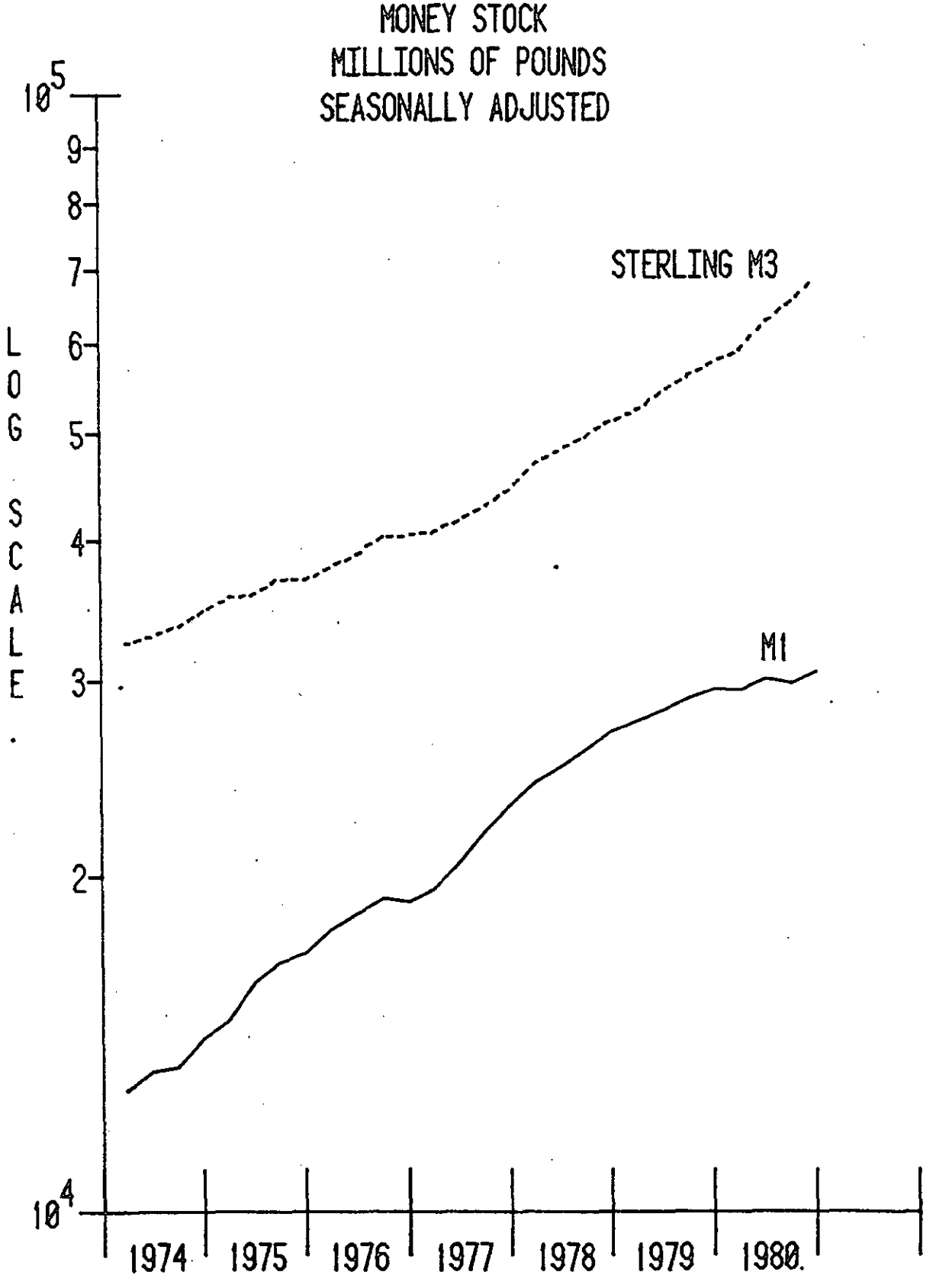
MONEY STOCK
MILLIONS OF POUNDS
SEASONALLY ADJUSTED
STERLING M3
M1
LOG SCALE
10^5
9
8
7
6
5
4
3
2
10^4
1974
1975
1976
1977
1978
1979
1980

Figure 4

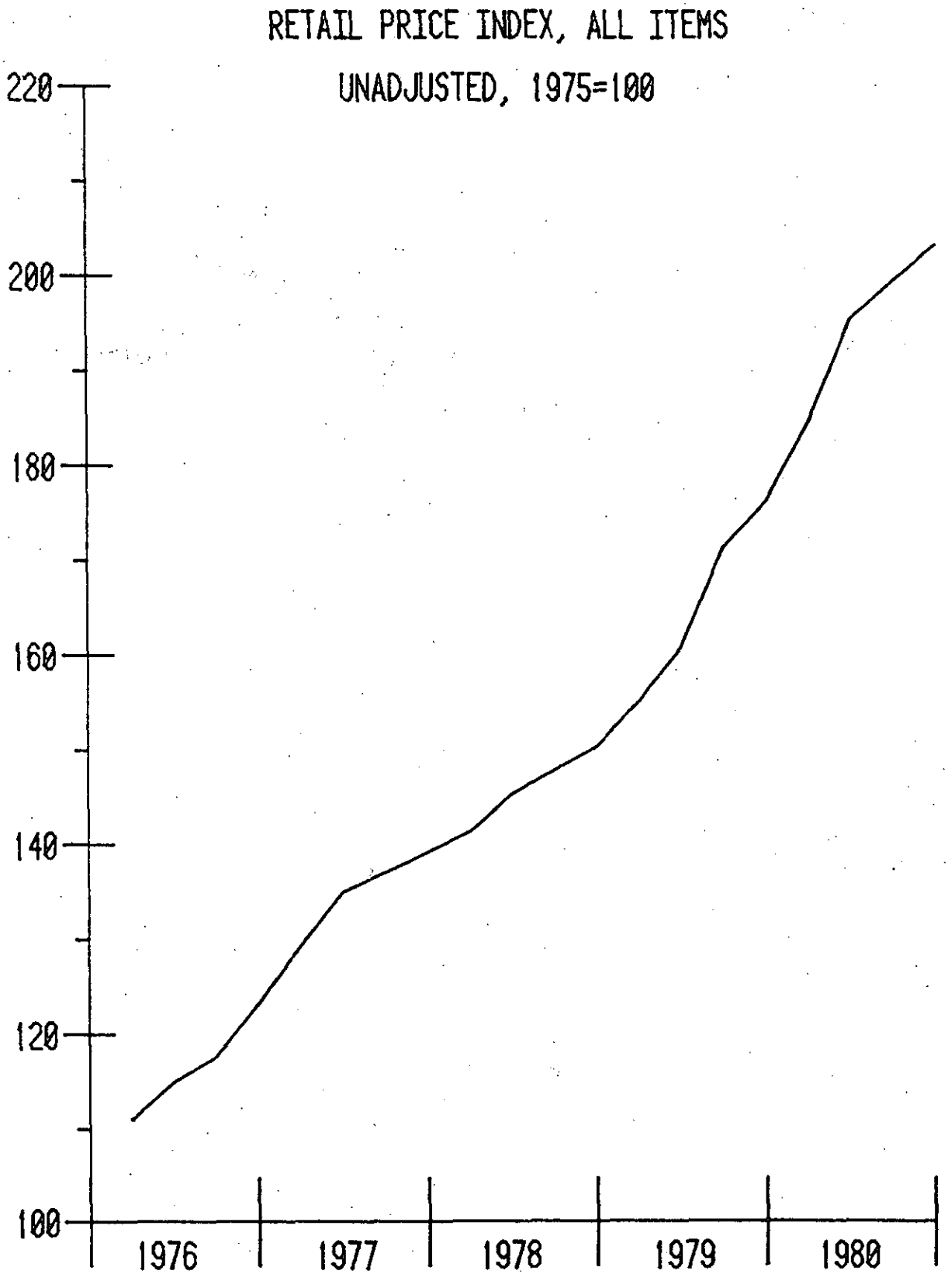
RETAIL PRICE INDEX, ALL ITEMS
UNADJUSTED, 1975=100
220
200
180
160
140
120
100
1976
1977
1978
1979
1980

Figure 5

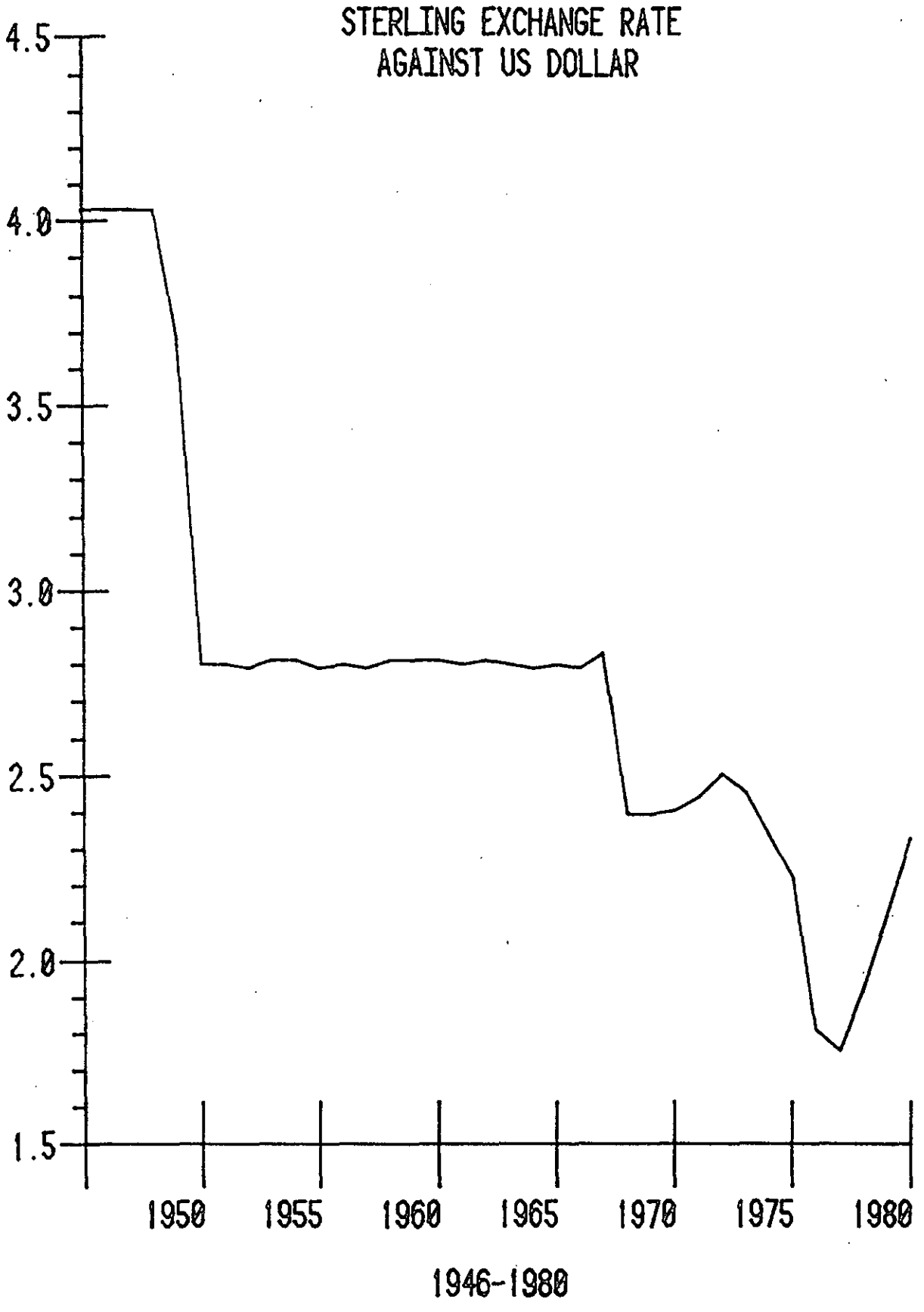
STERLING EXCHANGE RATE
AGAINST US DOLLAR
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1950
1955
1960
1965
1970
1975
1980
1946-1980

Figure 5

Table F1

FRENCH WHOLESALE PRICE INDEX
BASE 1913=100. 1913 FROM 1901-1910 INDEX=115.6
(Source: League of Nations Bulletin)

YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1913	100.78	100.26	100.52	101.12	100.43	101.38	99.13	99.05	100.43	98.96	99.22	98.53
1914	99.0	99.9	99.5	98.7	99.6	99.3	97.9	102.2	102.9	103.8	106.7	110.5
1915	119.5	124.5	129.5	133.0	135.2	137.4	139.8	140.7	144.5	151.3	158.9	163.2
1916	172.7	177.9	185.9	190.9	190.4	188.4	184.5	186.0	188.7	192.9	197.4	203.5
1917	215.6	225.6	228.9	248.0	256.0	266.2	268.0	270.0	279.9	283.6	293.2	304.3
1918	312.8	319.4	327.1	333.4	335.5	328.7	337.3	350.0	355.1	359.9	357.9	352.8
1919	347.6	340.4	335.7	332.2	325.1	328.7	348.6	347.5	360.0	381.8	405.0	422.7
1920	486.8	521.9	554.5	587.5	550.1	492.7	495.6	501.3	525.7	501.7	460.7	434.8
1921	406.6	377.4	359.9	347.1	329.4	325.0	330.1	331.3	344.0	331.3	331.8	325.7
1922	313.8	306.4	307.4	313.7	316.8	325.0	325.1	331.2	329.3	337.4	352.1	361.9
1923	386.9	421.8	424.0	414.7	406.5	408.7	406.7	413.1	423.6	420.5	442.9	458.6
1924	494.0	543.7	499.3	450.0	458.5	465.3	481.0	476.6	485.6	497.1	503.5	507.2
1925	514.4	515.0	513.5	512.8	519.8	542.6	556.8	557.2	555.7	572.3	605.5	632.4
1926	633.5	635.6	631.8	650.1	687.9	738.4	836.2	769.5	786.9	751.5	683.8	626.5
1927	621.8	631.6	641.4	636.5	628.6	622.6	619.9	617.9	600.3	587.5	.....	.....

Source: Haig [, p. 448]

Table F2

Dollar Exchange in Paris

(End-of-Month Daily Rates (1914-1918) and Averages of Daily Rates for Final Weeks of Each Month (1919-1927); Francs per dollar)

	1914	1915	1916	1917	1918	1919	1920
January	5.18	5.18	5.87	5.84	5.70	5.45	13.07
February	5.18	5.28	5.87	5.84	5.70	5.45	14.25
March	5.18	5.31	5.97	5.84	5.70	5.92	14.50
April	5.15	5.33	5.94	5.70	5.70	6.05	16.77
May	5.15	5.42	5.93	5.70	5.70	6.43	13.15
June	5.15	5.50	5.91	5.70	5.70	6.45	12.06
July	5.15	5.68	5.91	5.70	5.70	7.12	12.95
August	5.12	5.95	5.89	5.70	5.50	8.03	14.37
September	.....	5.75	5.85	5.70	5.47	8.52	14.68
October	5.18	5.97	5.84	5.70	5.47	8.67	15.67
November	5.10	5.91	5.84	5.70	5.47	9.68	16.40
December	5.17	5.85	5.84	5.70	5.45	10.52	17.04

	1921	1922	1923	1924	1925	1926	1927
January	14.04	12.31	15.57	21.74	18.49	26.77	25.32
February	13.92	11.00	16.45	25.57	19.38	27.49	25.55
March	14.30	11.12	15.23	18.32	19.06	28.65	25.54
April	13.22	10.82	14.84	15.45	19.20	30.15	25.53
May	11.79	11.07	15.15	18.80	19.83	30.60	25.53
June	12.40	11.99	16.32	18.88	21.56	34.93	25.54
July	12.98	11.96	16.84	19.86	21.11	41.15	25.56
August	12.96	13.02	17.65	18.48	21.30	35.12	25.51
September	14.00	13.15	16.15	18.96	21.12	35.66	25.48
October	13.74	14.19	17.19	19.13	23.92	32.52	25.47
November	14.23	14.38	18.51	18.82	26.09	28.11	25.43
December	12.40	13.74	19.59	18.56	26.90	25.25	25.40

Source: Haig [, p. 449]

Table E1

£ million, current prices

	Gross domestic product at factor cost			Final expenditure on goods and services at market prices								
	(1) At current prices £ million Based on: expenditure data	(2) At 1975 prices £ million Based on: expenditure data	Implicit price deflator 1975=100 (column 1 divided by column 2 x 100	Gross product At market At market prices	Consumers' expenditure	General government final consumption	Gross domestic fixed capital formation	Value of physical increase in stocks and work in progress	Exports of goods and services	Imports of goods and services	Taxes on expenditure	Subsidies
1946	8,823	.....	.....	10,009	7,229	2,348	929	-102	1,430	1,825	1,572	386
1947	9,361	.....	.....	10,704	7,975	1,810	1,203	292	1,652	2,228	1,814	471
1948	10,314	46,050	22.40	11,751	8,552	1,836	1,426	175	2,196	2,434	2,010	573
1949	10,949	47,482	23.06	12,412	8,907	2,061	1,581	65	2,495	2,697	1,989	526
1950	11,386	49,039	23.21	12,970	9,400	2,149	1,712	-210	2,995	3,076	2,060	476
1951	12,679	50,813	24.95	14,473	10,150	2,522	1,909	575	3,648	4,331	2,264	470
1952	13,836	50,819	27.23	15,701	10,691	2,999	2,134	50	3,760	3,933	2,286	421
1953	14,918	53,206	28.04	16,910	11,402	3,136	2,395	125	3,687	3,835	2,358	366
1954	15,761	55,131	28.59	17,831	12,091	3,213	2,595	56	3,837	3,961	2,493	423
1955	16,905	57,155	29.58	19,196	13,045	3,273	2,882	300	4,177	4,481	2,643	352
1956	18,301	58,271	31.41	20,754	13,756	3,531	3,164	259	4,598	4,554	2,817	364
1957	19,404	59,376	32.68	21,497	14,519	3,681	3,451	238	4,836	4,778	2,955	412
1958	20,227	59,089	34.23	22,864	15,306	3,751	3,569	111	4,710	4,583	3,028	391
1959	21,258	61,090	34.80	24,071	16,118	3,988	3,816	178	4,856	4,885	3,187	374
1960	22,637	63,911	35.42	25,522	16,939	4,224	4,190	562	5,156	5,549	3,378	493
1961	24,228	66,197	36.60	27,262	17,841	4,557	4,704	279	5,391	5,510	3,627	593
1962	25,284	66,815	37.84	28,555	18,930	4,882	4,833	-8	5,526	5,608	3,879	608
1963	26,913	69,532	38.71	30,371	20,137	5,138	5,066	180	5,877	6,027	4,027	569
1964	29,210	73,261	39.87	33,131	21,501	5,466	6,041	720	6,222	6,819	4,437	516
1965	31,219	75,234	41.50	35,607	22,933	5,994	6,504	485	6,662	6,971	4,959	571
1966	33,130	76,821	43.13	37,992	24,330	6,520	6,923	313	7,166	7,260	5,421	559
1967	34,935	78,813	44.33	40,131	25,529	7,213	7,524	316	7,404	7,855	5,997	801
1968	37,576	82,328	45.64	43,490	27,528	7,662	8,200	484	8,996	9,380	6,809	895
1969	39,633	83,760	47.32	46,573	29,233	7,997	8,591	573	10,109	9,930	7,782	842
1970	43,532	85,402	50.97	51,065	31,778	8,991	9,470	421	11,551	11,146	8,417	884
1971	49,442	87,572	56.46	57,291	35,599	10,250	10,517	158	12,960	12,193	8,788	939
1972	55,276	88,719	62.30	63,390	40,183	11,675	11,606	44	13,653	13,771	9,627	1,153
1973	64,258	95,506	67.28	72,936	47,759	13,380	14,238	1,448	17,124	19,013	10,121	1,443
1974	74,414	94,527	78.72	82,879	52,849	16,609	16,867	1,304	22,985	27,375	11,469	3,004
1975	93,954	93,954	100.00	104,413	64,424	23,074	20,417	-1,534	27,011	28,979	14,162	3,703
1976	111,245	97,971	113.55	124,330	74,751	26,779	23,599	864	35,211	36,874	16,553	3,468
1977	126,111	98,993	127.39	143,064	85,474	26,209	25,739	1,860	43,352	42,570	20,252	3,299
1978	144,442	101,929	141.71	164,034	98,395	32,934	26,695	1,070	47,442	45,502	23,253	3,661
1979	163,647	102,563	159.56	189,702	114,805	38,316	33,646	2,760	54,676	54,501	30,361	4,306

Table E2
Seasonally adjusted
Gross domestic product at factor cost

	(1) At current prices £ million Based on: expenditure data	(2) At 1975 factor cost £ million Based on: expenditure data	(3) Implicit price deflator, 1975=100. (column 1 divided by column 2)x100.
1969	39,633	83,760	
1970	43,532	85,402	
1971	49,442	87,572	
1972	55,276	88,719	
1973	64,258	95,506	
1974	74,414	94,527	
1975	93,954	93,954	
1976	111,245	97,971	
1977	126,111	98,993	
1978	144,442	101,929	
1979	164,385	102,973	
1975 1	21,733	23,283	
2	23,174	23,644	
3	23,893	23,297	
4	25,154	23,730	
1976 1	26,558	24,486	
2	27,021	24,156	
3	28,220	24,518	
4	29,446	24,811	
1977 1	29,925	24,397	
2	30,894	24,660	
3	32,065	24,677	
4	33,227	25,259	
1978 1	34,463	25,156	
2	35,733	25,602	
3	36,817	25,507	
4	37,429	25,664	
1979 1	37,677	25,175	
2	41,019	26,287	
3	42,119	25,655	
4	43,570	25,856	
1980 1	44,641	25,596	
2	47,182	25,445	
3	48,457	24,991	
4			

Table E3

Index of Industrial Production
Seasonally Adjusted
1975=100

		All industries covered	Manufacturing
1970		99.7	98.0
1971		99.8	97.5
1972		102.0	100.0
1973		109.5	108.4
1974		105.1	106.6
1975		100.0	100.0
1976		102.0	101.5
1977		105.9	103.0
1978		109.8	103.9
1979		112.6	104.2
1980		104.9	94.8
1975	3	98.3	98.0
	4	99.6	98.9
1976	1	100.4	99.4
	2	101.8	101.7
	3	101.4	101.6
	4	104.4	103.2
1977	1	106.2	104.5
	2	105.5	102.5
	3	105.9	102.7
	4	106.1	102.4
1978	1	107.6	102.9
	2	110.6	104.5
	3	111.0	104.9
	4	110.0	103.1
1979	1	110.1	102.3
	2	115.0	107.3
	3	112.7	103.2
	4	112.6	104.2
1980	1	110.0	100.1
	2	106.6	96.8
	3	102.9	93.3
	4	100.2	89.1
1979	J	105.0	94.8
	F	112.1	104.7
	M	113.2	107.4
	A	113.6	106.3
	M	115.4	107.4
	J	115.9	108.2
	J	115.1	106.4
	A	112.1	102.5
	S	110.9	100.7
	O	111.6	102.8
	N	113.7	105.2
	D	112.5	104.5
1980	J	111.6	102.2
	F	109.7	100.1
	M	108.7	98.0
	A	106.7	97.7
	M	106.5	96.5
	J	106.6	96.3
	J	105.1	95.2
	A	102.5	93.0
	S	101.2	91.5
	O	100.6	90.1
	N	100.5	89.3
	D	99.6	88.0
1981	J	98.3	87.5

Table E4

National Employment and Unemployment

United Kingdom
Thousands

	Working population	Unemployed excluding school-leavers	Unemployment rate	Vacancies notified to employment offices
1949	.....	.....	...	.....
1950	23,554	326.7	1.4	.....
1951	23,809	260.0	1.1	.....
1952	23,925	361.5	1.5	.....
1953	24,014	349.5	1.5	191.6
1954	24,293	296.7	1.2	228.0
1955	24,508	238.8	1.0	280.6
1956	24,730	254.2	1.0	241.2
1957	24,820	321.6	1.3	185.6
1958	24,684	441.9	1.8	137.1
1959	24,768	468.1	1.9	157.7
1960	24,509	368.2	1.5	212.8
1961	24,744	339.0	1.4	214.0
1962	25,038	453.9	1.8	150.0
1963	25,157	539.4	2.1	144.9
1964	25,299	393.7	1.6	222.0
1965	25,503	338.2	1.3	267.0
1966	25,636	353.3	1.4	256.7
1967	25,495	547.4	2.1	175.1
1968	25,383	574.4	2.3	189.5
1969	25,375	566.3	2.2	202.0
1970	25,308	602.0	2.4	188.3
1971	25,123	775.8	3.1	130.9
1972	25,195	854.9	3.4	147.3
1973	25,547	611.0	2.4	307.0
1974	25,601	600.1	2.3	302.7
1975	25,798	929.0	3.6	150.0
1976	26,097	1,270.3	4.9	120.9
1977	26,282	1,378.2	5.2	157.6
1978	26,316	1,375.7	5.2	210.3
1979	26,369	1,307.3	5.0	241.3
1980		1,647.6	6.8	143.0
1976 1	26,053	1,222.7	5.1	114.0
2	26,132	1,269.3	5.3	115.7
3	26,152	1,290.6	5.4	126.2
4	26,189	.....	...	.....

Table E4 (Cont.)

National Employment and Unemployment

United Kingdom
Thousands

		Working population	Unemployed excluding school-leavers	Unemployment rate	Vacancies notified to employment offices
1977	1	26,211	1,331.5	5.5	.....
	2	26,305	1,352.5	5.6	153.0
	3	26,374	1,400.1	5.8	154.7
	4	26,352	1,423.1	5.9	164.3
1978	1	26,398	1,412.7	5.8	186.7
	2	26,423	1,390.9	5.8	204.2
	3	26,427	1,365.0	5.7	216.3
	4	26.484	1,333.9	5.4	234.0
1979	1	26,493	1,349.4	5.6	233.6
	2	26,478	1,305.2	5.4	252.2
	3	26,410	1,266.8	5.2	249.1
	4	26,392	1,287.1	5.3	230.3
1980	1	26,366	1,373.9	5.7	194.6
	2	26,371	1,497.7	6.2	159.2
	3	26,304	1,699.0	7.0	119.8
	4	.....	2,019.8	8.4	98.3
1979	J	.....	1,276.1	5.3	254.4
	A	.....	1,260.1	5.2	248.4
	S	.....	1,264.3	5.2	244.4
	O	.....	1,277.3	5.3	238.0
	N	.....	1,283.4	5.3	233.6
	D	.....	1,300.7	5.4	219.4
1980	J	.....	1,334.0	5.5	207.5
	F	.....	1,376.8	5.7	193.4
	M	.....	1,411.0	5.8	182.8
	A	.....	1,456.2	6.0	170.2
	M	.....	1,495.3	6.2	162.2
	J	.....	1,541.7	6.4	145.3
	J	.....	1,609.2	6.7	127.9
	A	.....	1,696.8	7.0	120.5
	S	.....	1,791.1	7.4	111.1
	O	.....	1,892.9	7.8	100.0
	N	.....	2,030.0	8.4	96.2
	D	.....	2,136.6	8.8	98.8
1981	J	.....	2,228.3	9.2	103.6
	F	.....	2,304.1	9.5	98.2
	M	.....			

Table E5
Gross Domestic Fixed Capital Formation by Sector

		Total	Private sector	General government	Public corporations
1969		18,954	10,390	5,385	3,201
1970		19,460	10,685	5,475	3,316
1971		19,743	11,099	5,297	3,334
1972		19,823	11,776	5,076	2,932
1973		21,195	12,267	5,793	3,135
1974		20,616	11,641	5,418	3,557
1975		20,417	11,530	4,974	3,913
1976		20,636	11,811	4,786	4,039
1977		20,089	12,438	3,964	3,687
1978		20,802	13,793	3,520	3,489
1979		20,506	13,761	3,352	3,393
1975	1	5,112	2,916	1,239	957
	2	5,086	2,846	1,306	934
	3	5,178	2,986	1,165	1,027
	4	5,041	2,782	1,264	995
1976	1	5,226	2,844	1,280	1,102
	2	5,158	2,920	1,226	1,012
	3	5,203	3,097	1,156	950
	4	5,049	2,950	1,124	975
1977	1	4,883	2,892	1,079	912
	2	5,065	3,149	988	928
	3	4,997	3,119	953	925
	4	5,144	3,278	944	922
1978	1	5,287	3,493	938	856
	2	5,282	3,499	889	894
	3	5,136	3,401	868	867
	4	5,097	3,400	825	872
1979	1	4,998	3,318	818	862
	2	5,052	3,401	820	831
	3	5,182	3,436	882	864
	4	5,274	3,606	832	836
1980	1	5,169	3,547	765	857
	2	5,058	3,429	741	888
	3	4,923	3,357	719	847
	4				

Table E6

Retail Price Index

		All items	Percentage increase on year earlier
1948		23.1	
1949		23.8	
1950		24.5	
1951		26.7	
1952		29.2	
1953		30.1	
1954		30.6	
1955		32.0	
1956		33.6	
1957		34.8	
1958		35.9	
1959		36.1	
1960		36.5	
1961		37.7	
1962		39.3	
1963		40.1	
1964		41.4	
1965		43.4	
1966		45.1	
1967		46.2	
1968		48.4	
1969		51.0	
1970		54.2	6.4
1971		59.3	9.4
1972		63.6	7.1
1973		69.4	9.2
1974		80.5	16.1
1975		100.0	24.2
1976		116.5	16.5
1977		135.0	15.8
1978		146.2	8.3
1979		165.8	13.4
1980		195.6	18.0
1976	1	110.9	22.5
	2	114.9	16.0
	3	117.6	13.7
	4	123.0	15.0
1977	1	129.2	16.5
	2	134.9	17.4
	3	137.0	16.5
	4	139.0	13.0
1978	1	141.4	9.5
	2	145.3	7.6
	3	147.8	7.9
	4	150.3	8.1
1979	1	155.0	9.6
	2	160.7	10.6
	3	171.4	16.0
	4	176.2	17.3
1980	1	184.6	19.1
	2	195.3	21.5
	3	199.4	16.4
	4	203.2	15.3
1979	J	170.0	15.6
	A	171.3	15.8
	S	173.0	16.5
	O	174.8	17.2
	N	176.3	17.4
	D	177.6	17.2
1980	J	182.0	18.4
	F	184.6	19.1
	M	187.1	19.8
	A	193.5	21.8
	M	195.3	21.9
	J	197.1	21.0
	J	198.7	16.9
	A	199.2	16.3
	S	200.4	15.9
	O	201.7	15.4
	N	203.3	15.3
	D	204.5	15.1
1981	J	205.7	13.0
	F	207.6	12.5
	M		

Table E7
U.K. Balance of Payments, Current Accounts, and
U.S. $/£ Exchange Rate

		Current balance	Exchange rate $/£
1946		-230	4.03
1947		-381	4.03
1948		+26	4.03
1949		-1	3.68
1950		+307	2.80
1951		-369	2.80
1952		+163	2.79
1953		+145	2.81
1954		+117	2.81
1955		-155	2.792
1956		+208	2.796
1957		+233	2.794
1958		+360	2.810
1959		+172	2.809
1960		-228	2.808
1961		+47	2.802
1962		+155	2.808
1963		+125	2.800
1964		-362	2.793
1965		-43	2.796
1966		+113	2.793
1967		-289	2.828
1968		-273	2.394
1969		+471	2.390
1970		+779	2.396
1971		+1,076	2.444
1972		+189	2.502
1973		-1,056	2.453
1974		-3,380	2.340
1975		-1,674	2.220
1976		-1,060	1.805
1977		-206	1.746
1978		+707	1.920
1979		-1,630	2.122
1980		+2,737	2.328
1976	1	+106	1.998
	2	-352	1.805
	3	-436	1.766
	4	-378	1.651
1977	1	-362	1.714
	2	-431	1.719
	3	+307	1.735
	4	+280	1.813
1978	1	-194	1.928
	2	+417	1.835
	3	+87	1.932
	4	+397	1.984
1979	1	-692	2.016
	2	-192	2.081
	3	-189	2.234
	4	-557	2.157
1980	1	+70	2.254
	2	-88	2.286
	3	+870	2.382
	4	+1,885	2.387
1979	A	-43	2.073
	M	-139	2.058
	J	-10	2.112
	J	+57	2.260
	A	-89	2.238
	S	-157	2.200
	O	-364	2.145
	N	-89	2.133
	D	-104	2.198
1980	J	+159	2.266
	F	-128	2.290
	M	+39	2.206
	A	-222	2.216
	M	+62	2.304
	J	+72	2.336
	J	+385	2.373
	A	+56	2.371
	S	+429	2.402
	O	+711	2.417
	N	+615	2.396
	D	+559	2.346
1981	J	+1,042	2.405
	F	+614	2.294
	M		

Table E8
United Kingdom Money Supply

Money Stock
£million: amounts outstanding

At end period	M1 Season-ally adjusted	Sterling M3 Season-ally adjusted	M3 Season-ally adjusted
1963 1	6,740	10,550	10,650
2	6,870	10,730	10,830
3	6,990	10,970	11,080
4	7,210	11,210	11,320
1964 1	7,280	11,380	11,510
2	7,330	11,530	11,610
3	7,440	11,790	11,890
4	7,450	11,860	11,970
1965 1	7,490	12,050	12,160
2	7,570	12,300	12,420
3	7,620	12,540	12,660
4	7,610	12,640	12,750
1966 1	7,910	13,120	13,250
2	7,830	13,120	13,250
3	7,740	13,190	13,330
4	7,600	13,060	13,210
1967 1	7,780	13,380	13,530
2	7,880	13,630	13,810
3	8,160	14,090	14,270
4	8,250	14,290	14,530
1968 1	8,210	14,640	14,880
2	8,340	15,010	15,270
3	8,530	15,300	15,600
4	8,640	15,490	15,830
1969 1	8,490	15,740	16,090
2	8,310	15,490	15,910
3	8,380	15,630	16,090
4	8,660	15,820	16,280
1970 1	8,640	16,000	16,450
2	8,920	16,460	16,980
3	9,020	16,830	17,350
4	9,420	17,300	17,810
1971 1	9,820	18,020	18,510
2	9,900	18,270	18,780
3	10,210	18,670	19,180
4	10,310	19,530	19,960
1972 1	11,200	21,140	21,670
2	11,680	22,480	23,090
3	11,750	23,320	23,970
4	12,240	24,720	25,520
1973 1	12,280	26,290	27,390
2	13,130	27,650	28,720
3	12,660	29,620	30,940
4	13,040	31,450	32,880

Table E8 (Cont.)
United Kingdom Money Supply

Money Stock
£million: amounts outstanding

	M1 Seasonally adjusted	Sterling M3 Seasonally adjusted	M3 Seasonally adjusted
At end period			
1974 1	12,870	32,730	34,520
2	13,370	32,810	34,940
3	13,510	33,490	35,940
4	14,330	34,610	37,100
1975 1	14,880	35,560	38,120
2	16,080	35,840	38,100
3	16,770	37,030	39,780
4	17,070	36,920	40,010
1976 1	17,940	37,960	41,160
2	18,530	33,790	42,210
3	19,100	40,300	44,310
4	18,980	40,380	44,470
1977 1	19,540	40,720	45,070
2	20,530	41,740	46,220
3	22,020	42,990	47,390
4	23,180	44,540	48,950
1978 1	24,350	46,880	51,480
2	25,090	48,230	53,260
3	26,010	49,560	54,480
4	27,020	51,310	56,350
1979 1	27,580	52,370	57,150
2	28,250	54,380	59,290
3	28,950	56,210	61,040
4	29,460	57,830	63,270
1980 1	29,370	59,250	65,110
2	30,110	62,570	68,140
3	29,780	65,340	71,200
4	30,520	68,350	74,870
At mid-month			
1979 J	25,870	50,550	55,230
F	25,990	50,820	55,670
M	26,000	50,430	55,000
A	26,770	51,440	55,990
M	26,860	52,240	57,070
J	26,560	52,690	57,760
J	27,140	53,130	57,770
A	27,270	53,880	58,450
S	27,430	54,210	58,840
O	28,230	55,200	60,110
N	27,800	55,740	61,310
D	27,700	55,790	61,070
1980 J	27,720	56,270	61,140
F	27,310	56,590	61,680
M	27,600	56,880	62,210
A	27,470	57,070	62,900
M	27,570	58,300	64,540
J	27,260	58,730	64,720
J	28,250	61,690	67,290
A	28,200	63,510	69,230
S	28,380	63,830	69,270
O	28,520	65,030	70,380
N	28,640	66,370	72,110
D	29,020	66,740	72,540
1981 J	29,060	67,050	73,540
F	29,530	67,750	74,900
M			

Table E9

General Government Receipts and Expenditure[1]

£ million

	Receipts		Expenditure						
			Goods and services		Current and capital transfers				
	Taxes national insurance, etc. contributions	Trading income, rent, interest, etc.	Final consumption	Gross domestic capital formation	Current grants and subsidies	Capital transfers	Debt interest	Net lending, etc.[2]	Total
1975	38,547	4,439	23,074	5,064	14,353	1,196	4,211	3,755	51,653
1976	44,724	5,223	26,779	5,483	17,015	1,435	5,394	2,365	58,471
1977	51,008	5,909	29,209	4,935	19,502	1,537	6,373	251	61,807
1978	56,704	6,488	32,934	4,741	23,239	2,027	7,224	1,687	71,852
1979	68,053	7,353	38,316	5,239	27,348	1,901	8,829	3,273	84,906
1977 1	12,700	1,527	7,040	1,565	4,742	470	1,832	433	16,082
2	12,371	1,371	7,257	1,007	4,833	363	1,314	-178	14,596
3	12,822	1,697	7,368	1,171	4,847	328	1,747	88	15,549
4	13,115	1,314	7,544	1,192	5,080	376	1,480	-92	15,580
1978 1	14,116	1,720	7,972	1,483	5,658	693	1,995	74	17,875
2	13,539	1,512	8,073	962	5,725	413	1,455	439	17,067
3	13,897	1,702	8,252	1,145	5,783	442	1,951	729	18,302
4	15,152	1,554	8,637	1,151	6,073	479	1,823	445	18,608
1979 1	16,032	1,917	8,875	1,500	6,522	504	2,330	554	20,285
2	16,387	1,722	9,316	1,023	6,855	454	1,877	670	20,195
3	17,250	1,962	9,896	1,356	6,617	443	2,523	1,054	21,889
4	18,384	1,752	10,229	1,360	7,354	500	2,099	995	22,537
1980 1	20,845	2,045	10,872	1,700	7,747	576	3,149	152	24,196
2	18,713	2,136	11,656	1,144	8,145	521	2,209	1,444	25,119
3	21,811	2,157	12,386	1,415	8,075	618	3,299	1,185	26,978
4									

[1] An article describing the new presentation of government income and expenditure was published in the March 1977 issue of Economic Trends.

[2] Net lending to public corporations, private sector and overseas; cash expenditure on company securities, etc. (net).

Table E10

Financial Transactions of the Public Sector
£ million

	Financial deficit					Receipts					
						Public sector borrowing requirement					
								Contributions by:			
	Total	General government	Public corporations	Net lending etc., to private sector and overseas	Total	Financial transactions (net receipts)	Total	Central government	Local authorities	Public corporations	Seasonally adjusted total
1963	823	427	396	119	942	98	844	155	646	43	844
1964	942	362	580	193	1,135	145	990	435	560	-5	990
1965	799	172	627	312	1,111	-97	1,208	613	578	17	1,208
1966	851	7	844	226	1,077	113	964	544	414	6	964
1967	1,458	411	1,047	210	1,668	-192	1,860	1,152	725	-17	1,860
1968	946	219	727	217	1,163	-132	1,295	763	551	-19	1,295
1969	-471	-981	510	185	-286	159	-445	-893	603	-155	-445
1970	-681	-1,511	830	431	-250	-246	-4	-664	517	143	-4
1971	300	-786	1,086	620	920	-483	1,403	637	676	90	1,403
1972	1,547	804	743	558	2,105	55	2,050	1,600	514	-64	2,050
1973	2,764	1,997	767	880	3,644	-547	4,191	2,331	1,348	512	4,191
1974	4,695	3,165	1,530	1,697	6,392	-41	6,433	3,523	2,161	749	6,433
1975	7,705	4,912	2,793	1,833	9,538	-946	10,484	8,345	1,629	510	10,484
1976	8,413	6,159	2,254	1,286	9,699	572	9,127	6,786	1,103	1,238	9,127
1977	5,868	4,639	1,229	126	5,994	-1	5,995	4,469	183	1,343	5,995
1978	8,048	6,973	1,075	467	8,515	184	8,331	8,371	659	-699	8,331
1979	8,344	6,227	2,117	432	8,776	-3,788	12,564	10,396	1,732	436	12,564
1979 1	2,329	1,782	547	167	2,496	1,031	1,465	247	1,003	215	2,117
2	1,823	1,416	407	224	2,047	-1,298	3,345	3,797	-267	-185	3,006
3	2,636	1,623	1,013	104	2,740	-1,085	3,825	2,842	666	317	3,893
4	1,556	1,406	150	-63	1,493	-2,436	3,929	3,510	330	89	3,548
1980 1	1,700	1,226	474	-128	1,572	2,771	-1,199	-1,950	1,397	-646	131
2	3,543	2,646	897	490	4,033	-802	4,835	4,587	574	-326	4,122

Table E11

Net Purchases (+) or Sales (-) of Government Debt, By Maturity

	Total stocks	Redemptions and conversions	Classification by maturity: Up to 1 year	Over 1 and up to 5 years	Over 5 and up to 15 years	Over 15 years and undated
Financial years						
1975/76	+4,159	-735	-1,120	+2,196	+1,008	+2,810
1976/77	+6,290	-703	-1,402	+2,600	+817	+4,978
1977/78	+6,684	-672	-2,259	+2,931	+2,826	+3,858
1978/79	+6,256	-404	+1,098	+1,994	+1,441	+4,323
1979/80	+8,977	-1,133	-2,068	+2,333	+2,905	+6,940
Quarter ended						
1978 Sept.	+793	-151	-364	+257	+154	+897
Dec.	+1,288	-16	-57	+2	+802	+557
1979 Mar.	+2,254	-234	-324	+824	+486	+1,502
June	+2,732	-1	-314	+358	+1,159	+1,530
Sept.	+2,648	-403	-932	+1,062	+496	+2,425
Dec.	+2,511	-431	-178	+159	+1,317	+1,644
1980 Mar.	+1,086	-298	-644	+754	-67	+1,341
June	+3,377	-544	-574	+1,358	+943	+2,194
Sept.	+3,186	-19	-136	-261	+3,130	+472
Dec.	+3,055	-263	-734	+1,186	+1,425	+1,441

Table E12

Government Bonds
Per Cent Per Annum

	Short-dated (5 years)	Medium-dated (10 years)	Long-dated (20 years)
	Calculated redemption yields		
Last working days			
1980 Oct.	13.15	13.29	13.15
Nov.	12.97	13.43	13.35
Dec.	13.30	13.89	13.80
1981 Jan.	13.21	13.86	13.86
Feb.	13.00	13.84	13.94
Mondays			
1980 Oct. 20	13.07	13.33	13.23
" 27	12.93	13.07	12.95
Nov. 3	13.29	13.40	13.24
" 10	13.38	13.53	13.35
" 17	13.11	13.26	13.10
" 24	13.03	13.22	13.08
Dec. 1	12.95	13.34	13.26
" 8	13.04	13.44	13.34
" 15	13.62	14.08	13.94
" 22	13.18	13.79	13.70
" 29	13.28	13.88	13.80
1981 Jan. 5	13.19	13.89	13.85
" 12	13.38	14.06	14.02
" 19	13.30	14.05	14.06
" 26	13.29	13.95	13.95
Feb. 2	13.19	13.83	13.83
" 9	13.29	13.89	13.90
" 16	13.24	13.92	13.94
" 23	12.97	13.83	13.93
Mar. 2	13.03	13.87	13.97
" 9	13.15	13.95	14.03
" 16	12.85	13.59	13.63

Table E13

Interest Rates, Security Prices and Yields
Percentage Rate

		Last Friday		Last working day		Average of working days
		Bank of England's minimum lending rate to the market	Treasury bill yield	Euro-dollar 3-month rate	Building Societies Association recommended rate on shares	British government securities: long-dated (20 years)
1969		8	7.80	10.07	5.00	9.05
1970		7	6.93	6.57	5.00	9.25
1971		5	4.46	5.75	5.00	8.90
1972		9	8.48	5.91	5.25	8.97
1973		13	12.82	10.19	7.50	10.78
1974		11.50	11.30	10.07	7.50	14.77
1975		11.25	10.93	5.88	7.00	14.39
1976		14.25	13.98	5.07	7.80	14.43
1977		7	6.39	7.19	6.00	12.73
1978		12.50	11.91	11.69	8.00	12.47
1979		17	16.49	14.50	10.50	12.99
1980		14	13.45	17.75	10.50	
1978	J	6.50	5.85	7.81	6.00	11.06
	F	6.50	6.07	7.50	5.50	11.75
	M	6.50	6.02	7.50	5.50	11.72
	A	7.50	7.12	7.69	5.50	12.39
	M	9	8.67	7.94	5.50	12.72
	J	10	9.49	8.69	5.50	12.79
	J	10	9.33	8.41	6.70	12.72
	A	10	9.03	9	6.70	12.55
	S	10	9.38	9.56	6.70	12.64
	O	10	10.56	11.41	6.70	12.91
	N	12.50	11.91	11.88	6.70	13.16
	D	12.50	11.91	11.69	8.00	13.22
1979	J	12.50	12.46	10.44	8.00	13.68
	F	14	12.61	10.63	8.00	13.94
	M	13	11.78	10.64	8.00	12.35
	A	12	11.61	10.88	8.00	11.68
	M	12	11.79	10.57	8.00	11.94
	J	14	13.71	10.59	8.00	12.69
	J	14	13.82	11.56	8.00	12.25
	A	14	13.77	12.19	8.75	12.30
	S	14	13.88	12.88	8.75	12.60
	O	14	13.83	15.41	8.75	13.16
	N	17	16.80	14.31	8.75	14.54
	D	17	16.49	14.50	10.50	14.72
1980	J	17	16.38	14.41	10.50	14.17
	F	17	16.74	16.97	10.50	14.45
	M	17	16.89	19.94	10.50	14.70
	A	17	16.79	13.94	10.50	14.27
	M	17	16.77	9.75	10.50	14.01
	J	17	16.37	9.75	10.50	13.78
	J	16	15.06	9.81	10.50	13.07
	A	16	15.37	12.50	10.50	13.58
	S	16	14.65	13.94	10.50	13.38
	O	16	14.86	15.25	10.50	13.12
	N	14	13.38	18.31	10.50	13.22
	D	14	13.45	17.75	10.50	13.67
1981	J	14	13.02	17.44	9.25	13.96
	F	14	11.93	16.69	9.25	13.89
	M					

Table E14

Treasury Bill Tender and Short-Term Money Rates

	Treasury Bill Rate	Bank of England's minimum lending rate	Commercial bills: discount market's buying rates		London clearing banks		Sterling certificates of deposit (3 months)
	Average allotment rate		Prime bank bills (3 months)	Trade bills (3 months)	Call money		
	Discount rates per cent per annum						
Fridays							
1980 Oct. 17	14.27	16	15.25	15.75	12-16	17.50	15.84
" 24	14.33	16	15	16.25	14.50-16	17.50	16.13
" 31	14.36	16	15.94	16.50	13-15.75	16.75	16.63
Nov. 7	14.38	16	15.94	16.25	12-15.50	15	16.50
" 14	14.37	16	15.38	15.88	12-15.50	16.06	15
" 21	14.09	16	14.31	15.38	10-16	16.13	15.31
" 28	12.95	14	13.75	14.38	12-14	13.75	14.38
Dec. 5	13.00	14	13.40	14.44	10.50-14	14.13	14.56
" 12	13.14	14	13.88	14.50	11-13	12.75	14.56
" 19	13.13	14	13.84	14.50	13-14	14.44	14.81
" 24	13.02	14	14	14.50	11.50-14	13	14.69
1981 Jan. 2	12.99	14	13.81	15	12-13.50	12	14.81
" 9	12.91	14	13.56	14.50	10.50-14	13.50	14.38
" 16	12.85	14	13.44	14.50	10-14	13.88	14.19
" 23	12.75	14	13.07	14	13.25-14	14.75	14
" 30	12.61	14	12.75	13.63	12-14	14.19	13.56
Feb. 6	12.42	14	12.56	13.25	12.50-14	14	13.19
" 13	12.29	14	12.31	13.13	12-14	13.75	13.13
" 20	12.06	14	12.19	13.13	12.75-14	14	12.88
" 27	11.59	14	11.81	12.63	13-14	14.75	12.25
Mar. 6	11.39	14	11.75	12.50	13.75-14	15.75	12.44
" 13	11.64	12	11.75	12.56	10-14	12.38	12.50
" 20	11.58	12	11.69	12.44	10-12	12.38	12.44

TITLE 7TS Table F1
MARGINS: 5 125
TABS: 12 18 22 28 31 37 41 47 51 57 61 67 70 76 80 86 90 96 100 106 109 115 119 125
LINE SPACE 1
HEADER: Sargent/Table F1/5/27/81/Vicky

Table F1

FRENCH WHOLESALE PRICE INDEX
BASE 1913=100. 1913 FROM 1901-1910 INDEX=115.6
(Source: League of Nations Bulletin)

YEAR	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1913	100.78	100.26	100.52	101.12	100.43	101.38	99.13	99.05	100.43	98.96	99.22	98.53
1914	99.0	99.9	99.5	98.7	99.6	99.3	97.9	102.2	102.9	103.8	106.7	110.5
1915	119.5	124.5	129.5	133.0	135.2	137.4	139.8	140.7	144.5	151.3	158.9	163.2
1916	172.7	177.9	185.9	190.9	190.4	188.4	184.5	186.0	188.7	192.9	197.4	203.5
1917	215.6	225.6	228.9	248.0	256.0	266.2	268.0	270.0	279.9	283.6	293.2	304.3
1918	312.8	319.4	327.1	333.4	335.5	328.7	337.3	350.0	355.1	359.9	357.9	352.8
1919	347.6	340.4	335.7	332.2	325.1	328.7	348.6	347.5	360.0	381.8	405.0	422.7
1920	486.8	521.9	554.5	587.5	550.1	492.7	495.6	501.3	525.7	501.7	460.7	434.8
1921	406.6	377.4	359.9	347.1	329.4	325.0	330.1	331.3	344.0	331.3	331.8	325.7
1922	313.8	306.4	307.4	313.7	316.8	325.0	325.1	331.2	329.3	337.4	352.1	361.9
1923	386.9	421.8	424.0	414.7	406.5	408.7	406.7	413.1	423.6	420.5	442.9	458.6
1924	494.0	543.7	499.3	450.0	458.5	465.3	481.0	476.6	485.6	497.1	503.5	507.2
1925	514.4	515.0	513.5	512.8	519.8	542.6	556.8	557.2	555.7	572.3	605.5	632.4
1926	633.5	635.6	631.8	650.1	687.9	738.4	836.2	769.5	786.9	751.5	683.8	626.5
1927	621.8	631.6	641.4	636.5	628.6	622.6	619.9	617.9	600.3	587.5	.....	.....

Source: Haig [, p. 448]

TITLE 7TS Table F2
MARGINS: 12 90
TABS: 25 30 35 40 45 50 55 60 65 70 75 80 85 90
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Table F2

Dollar Exchange in Paris

(End-of-Month Daily Rates (1914-1918) and Averages of Daily Rates for Final Weeks of Each Month (1919-1927); Francs per dollar)

	1914	1915	1916	1917	1918	1919	1920
January	5.18	5.18	5.87	5.84	5.70	5.45	13.07
February	5.18	5.28	5.87	5.84	5.70	5.45	14.25
March	5.18	5.31	5.97	5.84	5.70	5.92	14.50
April	5.15	5.33	5.94	5.70	5.70	6.05	16.77
May	5.15	5.42	5.93	5.70	5.70	6.43	13.15
June	5.15	5.50	5.91	5.70	5.70	6.45	12.06
July	5.15	5.68	5.91	5.70	5.70	7.12	12.95
August	5.12	5.95	5.89	5.70	5.50	8.03	14.37
September	.....	5.75	5.85	5.70	5.47	8.52	14.68
October	5.18	5.97	5.84	5.70	5.47	8.67	15.67
November	5.10	5.91	5.84	5.70	5.47	9.68	16.40
December	5.17	5.85	5.84	5.70	5.45	10.52	17.04

	1921	1922	1923	1924	1925	1926	1927
January	14.04	12.31	15.57	21.74	18.49	26.77	25.32
February	13.92	11.00	16.45	25.57	19.38	27.49	25.55
March	14.30	11.12	15.23	18.32	19.06	28.65	25.54
April	13.22	10.82	14.84	15.45	19.20	30.15	25.53
May	11.79	11.07	15.15	18.80	19.83	30.60	25.53
June	12.40	11.99	16.32	18.88	21.56	34.93	25.54
July	12.98	11.96	16.84	19.86	21.11	41.15	25.56
August	12.96	13.02	17.65	18.48	21.30	35.12	25.51
September	14.00	13.15	16.15	18.96	21.12	35.66	25.48
October	13.74	14.19	17.19	19.13	23.92	32.52	25.47
November	14.23	14.38	18.51	18.82	26.09	28.11	25.43
December	12.40	13.74	19.59	18.56	26.90	25.25	25.40

Source: Haig [, p. 449]

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