GOVERNMENT DEBT, THE MONEY SUPPLY AND INFLATION: THEORY AND EVIDENCE FOR SEVEN INDUSTRIALIZED ECONOMIES

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ABSTRACT

This paper analyzes the theoretical and empirical relation between the growth of government debt and monetary policy for seven industrialized countries: France, Germany, Italy, Japan, Switzerland, the U.K., and the U.S. After analyzing the data we find that:

(i) rates of monetary growth frequently differ sharply from the rate of growth of nominal government debt, so that there is no evidence that a rapidly growing level of government debt encourages immediate monetization;

(ii) the rate of inflation is approximately equal to the difference between the rate of growth of the money supply and real output in all countries over all subperiods, so there is no evidence that an increase in government debt is a significant independent cause of inflation; and,

(iii) 1974 signals a turning point in postwar data trends, marked by a decline in the rate of growth of real output and a sharp rise in the rate of growth of nominal debt for all the countries.

Introduction

The role of government deficit financing in industrialized economies has become one of the most controversial topics in both policy and academic circles. This controversy arises because there is considerable disagreement over the extent to which government debt affects nominal and real variables in the economy. It is the purpose of this paper to investigate the post World War II behavior of the government debt, money, income, and inflation in seven industrialized countries and to suggest some hypotheses that are consistent with the data.

The empirical connection between monetary policy and debt growth has been investigated by many economists, primarily for the United States. Their conclusions are far from unanimous, and there appears to be only weak evidence, at best, that monetary policy is influenced by debt growth in the U.S.[1] There is much less comparable research for countries other than the U.S. A notable exception is King and Plosser (1984), who investigate the time series relation between debt growth and seignorage in each of twelve countries. They find no strong evidence that debt growth predicts monetary growth, with the exception of Italy.

Our approach differs substantially from these studies. To avoid the well-known inferential difficulties that arise with time series data generated by a single policy regime, we use a cross-sectional approach. We start with the premise that if the theoretical relation between debt growth and the performance of the economy is sufficiently robust, it should be possible to observe it across countries which operate under a variety of policy regimes. In addition to examining the concurrent relationship between debt and money growth across the seven countries, we analyze whether increases in nominal government debt have caused inflation independent of the behavior of the money

stock. This could occur, for example, if increased government debt signaled future monetization, thus raising interest rates and the velocity of the current money stock.

We implement the cross-sectional approach by dividing the post World War II sample into several subperiods. This division highlights the dramatic upward shift in the rate of growth of nominal government debt (that occurred in all countries after 1974) and the sharply differing monetary policy responses in the seven countries. We believe that the comparison of the post-1974 subperiod with previous periods yields valuable insights into the relevance of competing theories of government debt, money growth, and inflation. This paper adopts an informal statistical methodology as an important first step in devising more formal tests to differentiate among the hypotheses.[2]

Section I describes the theoretical framework for analyzing the relation of nominal government debt to other economic variables. In particular, we review the various theories concerning the impact of government debt, and we discuss the incentives for the central government to engage in inflationary monetary policies that are created by the issuance of nominal debt. In Section II we analyze the sources of the underlying changes in the ratio of government debt to income in the economy. Section III analyzes in detail the behavior of debt, income, and money for seven industrialized countries: France, Germany, Italy, Japan, Switzerland, the United Kingdom, and the United States. Section IV presents our conclusions. The choice and calculation of the debt series for the various countries is discussed in the Appendix.

I. Theoretical Analysis

The role of interest-bearing government debt in the determination of output, prices, and interest rates, has been debated vigorously by economists for decades. Many economists, policymakers, and those involved in interpreting and forecasting financial variables, believe that the issuance of government debt is of extreme importance in the credit markets because the supply of government bonds influences interest rates and, hence, economic activity.[3] This group, which we call the neo-Keynesians, believes that, for a given level of income, the real interest rate on government debt is positively related to the ratio of government debt to other financial assets. This relation exists because consumers view government bonds as net wealth and as an asset that is an imperfect substitute with other assets.

A second group of academic economists, whom we call the neo-Ricardians, believes that government interest-bearing debt is nothing more than a self-cancelling loan to oneself, an artificial balance sheet item which has little or no influence on economic behavior. The neo-Ricardian view is justified by assuming that consumers understand that government expenditures must eventually be paid for with taxes, and it is irrelevant whether consumers are immediately taxed or whether they are sold bonds which represent future taxes. In other words, the market value of government debt is exactly equal to the capitalized value of future tax liabilities.[4] The neo-Ricardians are frequently joined by "supply-side" economists, who, in their policy recommendations, have emphasized the benefits of tax cuts without registering any corresponding concern for the resulting deficits. These "supply-side" economists, who subscribe to the neo-Ricardian proposition, view any distortionary and distributional effects of future tax liabilities that arise

from the interest payments on a larger debt to be of second-order importance in determining macroeconomic equilibrium.[5]

A third group, whom we shall call neo-monetarists, and whose views we shall examine in detail, takes a theoretical position somewhere between the neo-Keynesians and the neo-Ricardians. Neo-monetarists assert that the influence of interest-bearing national debt on the economy stems from the impact of debt policy on monetary policy.[6] Their assertion stands in sharp contrast to the traditional monetarist view that monetary policy should be regarded as being independent of other government policies.

At least three distinct ways in which debt policy influences monetary policy have been identified in the literature. First, monetary policy and debt policy may be connected because they are alternative ways of collecting revenue. It has been well-established that anticipated inflation is a tax on real cash balances.[7] Since real cash balances can be taxed through inflation, it has been argued that the government should extract some tax revenue from this source by engineering a monetary expansion.[8] In an optimal taxation framework, all tax rates should be set to minimize the deadweight costs of raising government revenues. To the extent that high deficits signify that future taxes must be raised, higher inflation may follow, because, in general, more revenues from inflation will be part of an optimum government tax program. Of course, once the inflation tax is adopted, it is assumed that all nominal contracts will adjust so that the anticipated inflation would have no additional distributional impact other than that caused by the inflation tax on money balances.

A second way in which debt policy can affect monetary policy is through the constraints placed on monetary policy because there must be a limit to the growth of interest-bearing government debt relative to the economy.[9] This

analysis assumes that the government generally is unwilling (or unable) to raise taxes by enough to keep the debt-to-income ratio from rising over time. The only equilibrium possible is one in which the monetary authority is forced to monetize some of the debt, at some point in the future. But since consumers foresee this eventuality, goods prices rise in response to the expected growth of nominal debt, even though the monetary authority may not monetize the excess deficits immediately. Expected future monetization raises current nominal interest rates, and this rise in nominal rates increases the velocity of money, causing current inflation. It has also been pointed out that delaying the monetization of excess deficits is suboptimal, because the overall inflation that takes place may be greater if the monetization is delayed.[10] The Sargent and Wallace (1981) view that positive growth of the debt-to-GNP ratio is ultimately unstable recently has been criticized by Darby (1984). Darby's analysis shows that the Sargent and Wallace conclusions hold only when the after-tax real interest rate exceeds the real growth rate of the economy. If the real rates are lower than that, exogenous increases in the debt-to-GNP ratio are self-limiting, without resorting to monetary accommodation. Darby provides evidence that at least for the U.S., ex-post real rates consistently have been below the real growth rate of the U.S. economy.

Barro and Gordon (1983a, b) show that yet a third way in which debt policy can affect monetary policy, and thereby the inflation rate, is related to the "time-inconsistency problem" facing monetary policy. This analysis goes beyond that provided by Sargent and Wallace, as described above, by elaborating on the incentives of the government to inflate, and by deriving a fully rational (though suboptimal) equilibrium. We shall examine the

implications of their model in detail, since this model seems particularly relevant to the post-War industrialized economies.

The Barro-Gordon analysis highlights the fact that the existence of nominal debt acts as an incentive for inflation because it may be possible for the government to engineer a reduction in the real value of the debt (and hence of future tax liabilities) by inflating at a rate greater than bondholders anticipate. Once nominal, term interest-bearing debt is issued, it is in the interest of the government, as well as the general public taken as a whole, to produce an unexpectedly high inflation, so as to impose a lump-sum tax on the holders of government bonds.[11] Although such a lump-sum tax may have distributional effects, it reduces deadweight losses because it implies lower distortionary tax rates. In this scenario the government finds it advantageous to increase the inflation rate above the rate it has promised to deliver. The incentive to break such a previous promise has been referred to as the "time-inconsistency problem" of optimal government plans.[12] Of course, since the bondholders know that there is an incentive to inflate, they demand an appropriate inflation premium in the interest rates to protect against this (expected) eventuality. As a result, the government has to inflate at the higher rate, without getting the benefit of lump-sum taxation. The equilibrium inflation rate is a result of the tradeoff between the disutility of the absolute inflation rate and the ability of the government to gain by inflating at a rate greater than anticipated. The resulting equilibrium is characterized by a fully anticipated inflation rate that is higher than required by an optimal tax structure, and it is suboptimal.

Optimal monetary policy is time-inconsistent because of the inability of the monetary authority to precommit effectively the future path of monetary

growth. Effective precommitment in this context means that the government is not allowed to use discretion in changing future policy. If monetary policy is precommitted, the bondholder can lend to the government knowing that the real value of the outstanding debt will not be unexpectedly debased by the monetary authority. In a fiat money standard, such as the industrialized countries now have, there may not be any effective means of precommitment by the central bank. A commodity standard has often been suggested as an effective precommitment strategy. Under a commodity standard, such as the gold or gold exchange standard, it is claimed that the monetary authority has little or no discretion with respect to the monetization of the public debt. Under these circumstances, it is more likely that the Ricardian equivalence propositions will prevail, and debt issues will eventually be extinguished with future taxes, since the monetary authority has no way to generate unanticipated inflation.[13]

In summary, the neo-Keynesians believe that debt growth can be an independent cause of inflation, even if the money supply is held constant. The neo-monetarists, on the other hand, believe that debt growth will lead to inflation only because increases in government debt will cause a current or future increase in the money stock. Neo-Ricardians, on the other hand, would expect to see no relation between debt growth and money growth, either present or future. We now examine the methodology for determining which of the above theories is supported by the data.

II. Methodology

A. Government Debt Policy

The goal of our research is to isolate the factors which influence the value of government debt relative to output and to determine whether the relative influence of these factors is consistent with the theories discussed

in Section I. All those theories relate to the size of government debt relative to the size of the entire economy. Therefore the relevant variable to examine in analyzing the effect of debt on the economy is the debt-to-income ratio.

The debt to income ratio, d, is defined as

$$d = B/py \quad , \tag{1}$$

where B is the nominal face value of government interest bearing debt, p is the price level, and y is the real gross national product. Changes in the debt ratio can be caused by any one of three factors: (1) changes in the value of nominal bonds caused by the deficits or surpluses in the government budget; (2) changes in the price level, which alter the real value of the debt outstanding; and (3) changes in real output, which measures the debt capacity of the economy.[14]

From (1) it is immediate that the rate of change in the debt to income ratio can be expressed as

$$\dot{d}/d = \dot{B}/B - \dot{p}/p - \dot{y}/y \quad , \tag{2}$$

where the superior dot represents the time rate of change. In words, equation (2) states that the proportional rate of change in the debt-to-income ratio is the sum of the nominal rate of growth of the face value of the debt, minus the rate of inflation, minus the rate of growth of real income.

The growth rate of the face value of the nominal debt is nothing more than the government deficit divided by the total bonds outstanding. It is interesting to note that the rate of growth of the face value of the nominal debt is rarely quoted in policy discussions of federal finance, although in discussions of monetary policy, the rate of growth of nominal money is

considered the critical policy target, and monetary policy goals are frequently expressed in terms of nominal money growth.

Inflation has an important effect on the debt-to-income ratio. As has been noted by others, the change in the real value of the government debt, $(\dot{B/p})$, does not equal the real value of the change in the debt, $\dot{B}/p$.[15] Hence the cumulation of real deficits does not equal the real value of the debt. Specifically, we can write,

$$(3) \qquad (\dot{B/p}) = \dot{B}/p - (B/p)(\dot{p}/p) \ .$$

Many economists consider the changes in the real value of the debt, the left-hand side of equation (3), to be the critical variable in determining the impact of government fiscal policies on the economy.[16] In particular, the argument is made that inflation, by reducing the real value of the debt outstanding, differs little from the government running a surplus. In fact, it is frequently the case in the U.S. that the value of government bonds issued to finance the deficit is smaller than the reduction in the real value of the debt outstanding, so that the real value of the debt has declined even though the government has run deficits.

It is our belief that it is incorrect to take the change in the real value of government debt as the proper measure of the impact of the government budget on all aspects of economic activity, because the change in the nominal value of the debt may itself influence the price level (and real income).[17] As an analogy, consider the impact of the money supply on the price level. If the velocity of money is constant, then increases in nominal money would be offset by an equivalent increase in the price level, resulting in no change in the real quantity of money. However, it would be incorrect to interpret this as meaning that nominal money, over this inflationary episode, had no impact

on the economy. To push the point further, a graph of the money-to-income ratio during a hyperinflation would show a declining trend, as the inflation increases the velocity of money in circulation. It would be foolish to assert that this declining ratio means money could not have been a major factor in the economic events of this period.[18] Likewise, it is not acceptable to assert that during the periods of declining debt-to-income ratios, debt cannot have been an important determinant of any aspect of economic activity. That inflation reduces the real value of debt in no way implies that the increase in the nominal quantity of that debt is not instrumental in raising the price level or otherwise influencing real variables.

In summary, although inflation is critical in reducing the real value of the debt outstanding, it is of dubious value to sum the change in the real value of debt with the real deficit in order to measure the total impact of the debt on economic activity. For this reason we show separately the impact of inflation on the debt-to-income ratio in order to analyze the debt policies in each economy.

The third component of the change in the debt-to-income ratio is the growth rate of real output. The level of output is a convenient normalization factor, and it measures, in some sense, the debt capacity of the economy. The larger the taxable income base, the larger is the ability of the economy to absorb debt without increasing the tax rates and without applying pressure on the monetary authority for monetization. If the debt-to-income ratio is to remain constant in the face of positive real growth (and a non-declining price level), the federal budget must run a continuous deficit. In this case, the rate of growth of nominal debt will equal the growth rate of real income in the absence of inflation. A constant debt-to-income ratio implies that any

long-term deviations between the growth rates of nominal debt and real income must eventually be closed by a change in the rate of inflation.

B. Monetary Policy

In contrast to debt policy, there is closer agreement on how to assess the stance of monetary policy. Most experts agree that the growth rate of some nominal monetary aggregate, particularly in the long-run, is an appropriate indicator of monetary policy. Furthermore, there is general agreement that comparing the rate of growth of the chosen monetary aggregate to the rate of growth of real GNP provides useful information about the likely rate of inflation. However, which of the many possible aggregates best reflects monetary policy is the subject of intense debate. For the purposes of this research, we have calculated data on both the monetary base and M1, the latter composed of currency in the hands of the public and demand (or transactions) deposits.[19]

The standard monetarist identity is

$$Y \equiv MV \ , \tag{4}$$

where Y is nominal GNP, M is the nominal monetary aggregate, and V is the velocity of the monetary aggregate. Equation (4) can be expressed in terms of the rate of change of the variables,

$$\dot{Y}/Y = \dot{M}/M + \dot{V}/V \ . \tag{5}$$

If the relation between the growth rate of GNP and the money supply is stable, then the variation in the growth rate of velocity will be small relative to the variation in the growth rate of nominal GNP. This leads to the traditional monetarist interpretation that the growth rate of the money supply primarily determines the growth in nominal GNP.

In terms of our theories discussed in Section I, the behavior of velocity is important. If the neo-Keynesians or the neo-monetarists are correct, then debt growth can independently influence nominal GNP through changes in the velocity of money. There need not be immediate monetization by the central bank in order for the supply of government bonds to influence nominal GNP. However, data indicating that the behavior of velocity is largely independent of the rate of growth of nominal government debt support the neo-Ricardian view that debt policy, per se, does not influence nominal output.

III. Empirical Evidence

Long-term historical studies have shown that during periods when an economy is neither at war nor in recession, the debt-to-income ratio normally decreases.[20] Before World War II, the decreases in the debt-to-income ratio are due both to actual surpluses run by the government and to the expansion of real income. However, in the post-World War II period, the government budget has been almost always in deficit. Figure 1 shows the behavior of the debt-to-income ratio in France, Germany, Italy, Japan, Switzerland, the U.K., and the U.S. in the post-war period. Figures 2 through 8 show the behavior of the rate of growth of nominal debt, monetary base, inflation, and real income for each of the seven countries. The scales are standardized so that each variable is plotted on the same scale for each country.

The outstanding impression we are left with when we examine Figures 1 through 8 is that remarkable changes in the behavior of all the variables occur starting in 1974. A general characterization of the data is that debt-to-income ratios rise rapidly after 1974 in all the countries we examine. Only in the case of Italy was the ratio already rising by 1974. And only in the case of Switzerland and the U.K. does the ratio resume its downward trend.

Table 1 lists annual average growth rates for selected variables over three subperiods. This table is taken from the growth rate matrices displayed in Tables 3 through 9. The selection of the 1962 cutoff is arbitrary, but the 1974 cutoff is intended to capture the dramatic shift in behavior of the variables.

The path of real GNP growth changes dramatically starting with 1974. The average growth rate of real GNP for all countries for 1952-62 and 1962-74 are 5.4 percent and 4.7 percent, respectively. However, the average growth rate of real GNP falls to only 1.9 percent after 1974, and it falls relative to its pre-1974 level in every country. Furthermore, the growth rates fall at least by one-half relative to the previous 10-year period in every case except the U.S. This fall in the growth rates of real GNP appears not to be caused by severe recessions. Generally, with some variation, the annual rates of growth of real GNP are low throughout 1974-82. The main exception to this scenario is the U.S., where three years of healthy growth are sandwiched between two recessions.

The growth rate of nominal debt also shows a dramatic jump in 1974 for all the countries. Of the countries studied, Switzerland is the only one that has managed to bring debt growth in line with its historical experience. In the U.K. and the U.S., although nominal debt grows much more rapidly after 1974 than their respective historical experience, the debt growth is similar to the growth in nominal GNP. The annualized growth rate of nominal debt averaged over all the countries is 4.1 percent and 7.7 percent for 1952-62 and 1963-73, respectively. The average growth rate for 1974-82 is 19.1 percent.

There are sharp differences in the inflation experience of these countries, in contrast to the relatively similar behavior of real output and nominal debt growth. Germany, Japan, and Switzerland maintained or reduced

their inflation rates since 1974. These three countries experienced an average inflation of 2.9 percent and 5.5 percent for 1952-62 and 1962-74, respectively, and 4.1 percent for 1974-82. Inflation increased between the first and the second period and declined after 1974 in all three countries. The second group of countries, France, Italy, U.K., and U.S., also had modest rises in inflation between the first and the second period in each case. In fact, their record for the first two periods is indistinguishable from that of the first group. However, in contrast to the first group of countries, the second group had significantly higher inflation after 1974. The average inflation rate for the second group of countries is 2.9 percent and 5.5 percent for 1952-62 and 1962-74 respectively. But after 1974 the average inflation jumps to 12.0 percent. The smallest jump is in the U.S. (78 percent relative to 1962-74) and the largest jump is Italy (149 percent).

Finally we examine the behavior of the monetary base. Here again there are sharp divisions in the countries' records. The first group of countries, Germany, Japan and Switzerland, sharply reduced the growth rate of their base since 1974. The average growth rate of the base in the three countries was 9.8 percent and 11.0 percent for 1952-62 and 1962-74 respectively, but it was reduced to 4.1 percent in 1974-82. The biggest reduction took place in Switzerland (93 percent relative to the 1962-74 period) while the smallest reduction was in Germany (44 percent). The patterns of M1 growth are similar, though somewhat less sharp. It is of great importance to note that Germany, Japan, and Switzerland are the three countries whose inflation rate did not rise after 1974.

In contrast to the first group, of the second group of four countries, France, the U.K., and the U.S. did not change their base growth very much in the 1974-82 subperiod, relative to the earlier periods. The average growth

rate of the base in these three countries was 4.4 percent and 7.4 percent for 1952-62 and 1962-74 subperiods, respectively, and it was 6.6 percent after 1974. These averages, however, mask important differences in monetary policies. In France there is a 2.5 percent decline in the base in 1975 followed by growth rates that change sharply each year. In the U.S. there is a sharp expansion in base growth in 1977 and 1978, and moderate growth at other times. In the U.K. there is a sharp expansion of the base in 1975-76 (18.3 percent), a sharp contraction in 1980 (-3.1 percent), and moderate growth in between. The behavior of the base for Italy, the remaining country in the group, is unique. Italy is the only country whose base growth accelerated after 1974.

Compared to the monetary base, the behavior of M1 growth corresponds more closely to the inflation experience of France, the U.S., and the U.K. In all three countries there is some increase in the growth rate of M1 between the 1962-74 and 1974-82 periods. The average M1 growth for the three countries rises from 7.0 to 9.7 percent, but most of the rise is accounted for by the 60 percent increase in the growth rate of M1 in the U.K.

Table 2 summarizes the change in the growth rates of debt, base, and M1 between the 1962-74 and the 1974-82 periods. A comparison of the changes in the growth rates of these variables reveals that the average change in the growth rate of debt between the 1962-74 and 1974-82 periods is 131 percent, while the comparable average change in the growth rate of the base is -59 percent and that of M1 growth is -4 percent. For Germany, Japan, and Switzerland the average change in the growth rate of debt is 77 percent, and the comparable change is -139 percent for base and -44 percent for M1. For France, the U.K., and the U.S., the average change in the growth rate of debt is 209 percent, compared with a -12 percent average change in the growth rate

of the base and 32 percent change in the growth rate of M1. Finally, for Italy the average changes are 57 percent, 41 percent, and 11 percent for debt, base, and M1 growth, respectively.

IV. Implications of the Data

The questions we intend to address can be summarized as follows:

(1) What is the evidence in favor of the hypothesis that the growth rate of government debt influences the current rate of money growth?

(2) What is the evidence in favor of the hypothesis that the growth rate of government debt influences the current rate of inflation, regardless of the current rate of money growth?

If debt growth influences money growth we should find that countries with high debt growth also have high money growth, and that changes in debt growth are accompanied by changes in money growth in the same direction. If debt growth influences the rate of inflation independently of money growth, we should find that countries with high debt growth experience an increase in the velocity of money.[21] The data we analyze contain some interesting and, we believe, provocative answers to these questions.

As Table 2 shows, a sharply higher rate of growth of nominal debt after 1974 is common to all countries. The increases in the growth rate of debt from the 1962-74 subperiod to the 1974-82 subperiod range from a low of almost 6 percentage points in Switzerland to just over 18 percentage points in France and averages 11.4 percentage points. However, this table reveals that increasing debt growth is associated with comparably increasing base and M1 growth only in the case of Italy. In the U.S., increasing debt growth is associated with very modest increases in base and M1 growth, while in France and the U.K., increasing debt growth is associated with decreasing base growth

and increasing M1 growth. In Germany, Japan and Switzerland increasing debt growth is associated with decreasing base and M1 growth.

This analysis suggests that there is no simple overall relation between debt growth and base growth, and, at most, a very weak relation between debt growth and M1 growth. It is interesting to note that the weak positive association between debt growth and money growth seems more pronounced in countries where the debt-to-GNP ratio is relatively high, such as in Italy, the U.K., and the U.S. This association would be consistent with the neo-monetarist position that the gains from unanticipated inflation increase as the debt-to-GNP ratio increases. However, of these three countries, Italy has gone to fully indexed debt issues, and the U.K. is moving increasingly in that direction. At the same time, both the U.K. and the U.S. have decreased the growth of their monetary aggregates and inflation in the latter part of the 1974-82 subperiod, even though the debt-to-GNP ratio is rising in both countries. Therefore, the economic forces described by the neo-monetarists, to the extent they are operative, appear to be offset by other forces.

Turning to the question of whether debt growth influences the inflation rate regardless of money growth, Table 1 shows that in almost all the countries it appears that the current rate of growth of the monetary base, corrected by the rate of growth of real income, controls the rate of inflation. This statement is best illustrated in Germany and Japan. Both countries experienced sharply rising debt-to-income ratios in recent years, yet both have been able to moderate inflation by controlling the monetary base. Japan, with a nearly 36 percent rate of growth of nominal debt in the last subperiod, was able to keep the rate of inflation to about 4 percent by holding the rate of growth of the base to 7 percent. In Germany, the rate of growth of nominal debt increased from 8.1 to 18.2 percent, yet the growth rate

of the base declined from 8.4 to 4.7 percent, and inflation was held in check. Also for these two countries, the creation of nominal debt did not result in any large shifts in velocity.

The United States underwent a similar experience between the last two subperiods. Despite the fact that the rate of growth of nominal debt in the U.S. rose from 2.9 to 12.9 percent, the rate of growth of the base increased by only 1.0 percentage point, and the velocity of the base increased by only 0.8 percentage points. Italy has experienced a rapid rise in both the rate of growth of nominal debt and the monetary base, and the velocity of the base seems unaffected by these changes.

For France and the U.K., the sharply higher rate of growth of nominal debt in the 1974-82 subperiod is also not matched by an acceleration in the rate of growth of the monetary base. However, the velocity of the base increases sharply in both cases. This observation is consistent with both the neo-Keynesian and neo-monetarist hypotheses. The neo-monetarist hypothesis maintains that rapid debt creation creates the incentive for future monetary expansion, thereby raising current nominal interest rates and velocity and causing inflation. The velocity rise in this framework occurs because agents believe that future monetization will take place. With a sufficiently long time series one could ascertain whether current debt growth is associated with future monetary growth.[22] Since the major increases in debt growth occur in the latter part of our sample, it is not possible to determine whether rapid debt growth results in future monetization. The data only show that debt growth is not associated with current money growth. The rise in the base velocity in the U.K. and France could also have occurred because of a rise in the real rates of interest, according to the neo-Keynesian viewpoint. Examination of Table 1 indicates that the sharp rise in velocity of the

monetary base in the U.K. and France in the final subperiod can be attributed to a rise in the M1 money supply multiplier, i.e., ratio of M1 to the monetary base. Therefore, the M1 velocity does not show the sharp increase that the base velocity displays over this period. If the increase in the M1 multiplier is caused by factors other than an increase in interest rates, such as reserve requirement or other institutional changes, this would tend to counter both the neo-monetarist and the neo-Keynesian viewpoints, and strengthen the traditional monetarist (and the neo-Ricardian) position. This occurs because the velocity shift is due to a specific, policy-related change in the demand for the monetary base. Since we have not examined interest rates in this paper, we are not in a position to judge whether the cause of the rise in this ratio is due to institutional regulations or to a rise in the desired level of deposits relative to currency induced by interest rates.

An additional finding is that all countries which experienced increased inflation in the last subperiod, except Italy, did so not because of increased monetary expansion, but because of a reduction in the rate of growth of real output, or a rise in the velocity of base money. The data show that monetary base growth in France, the U.K., and the U.S. did not change significantly between the 1962-1974 and the 1974-82 subperiod, so that inflation in these three countries seems to be related to the large and protracted decline in real growth after 1974.[23] The rise in inflation in France and the U.K. is due to the sharp increase in velocity of the monetary base. However, as we discuss above, M1 growth did accelerate somewhat in France and in the U.K. Whether this acceleration was a result of active monetary policy, or whether it was an endogenous change accepted by the monetary authorities is open to interpretation. Germany, Japan, and Switzerland avoided inflation by actively reducing base growth to conform to the lower real growth. Except for Italy,

the slowdown in real growth since 1974 appears to be a significant factor explaining inflation (or preventing deflation) in all these economies.

Overall, the data imply that debt growth does not play an important role in the determination of money growth. The data also imply that it is current monetary growth (given real growth), and not nominal debt growth, which controls the rate of inflation. Except for the two cases discussed above, changes in base velocity are unimportant in explaining current price level changes. Therefore, the hypothesis that a large and rapidly growing level of nominal debt either encourages rapid current monetization or causes inflation through changes in velocity which are induced by fears of future monetization, does not find significant support in the data. In this sense, the data seem roughly consistent with the narrowest interpretation of the neo-Ricardian hypothesis which claims that individuals expect current debt growth to be stabilized with future explicit taxes and not with monetary expansion.

Appendix

Data: Definitions and Sources

Definition of Debt:

In order to begin the analysis of the debt-to-GNP ratio defined by equation (1) in the text, it is necessary to choose a debt aggregate from the many competing definitions of government debt. Unfortunately, there is no one "correct" definition that is useful in answering all economic questions about government finances. Consistent with our discussion in Section I, we shall seek a debt measure which both measures the need for the government to raise future revenues, and reflects the incentive of the monetary authority to inflate away these future tax liabilities.

The broadest and perhaps most difficult measure to calculate would be the sum of all direct federal government obligations, state and local obligations (where applicable), public sector debt (publicly owned corporations), and government guaranteed debt. Such an aggregate does not, however, distinguish between obligations that must be paid in whole through some form of taxation (broadly defined to include taxation by inflation), bonds that are issued to finance public capital projects that have positive net present value, and obligations that are merely guaranteed by the government. Thus, such an aggregate cannot assess adequately the impact of government borrowing on financial markets, or the future revenues that must be raised through additional taxes from all sources.

At the other extreme, the most restricted measure of government debt can be constructed by subtracting from total government debt any debt that corresponds to net purchases of capital goods, debt held by government agencies and the central bank, financial assets held by any part of the government, and also by subtracting the payment of the inflation premium built

into interest rates. This definition of the debt is appropriate for measuring the amount of government consumption and transfer payments that are financed through borrowing, and it is probably a useful measure of the impact of government on the financial markets. But this definition, like the most broad one, does not measure appropriately the incentive government has to inflate away its debt, nor is it a good measure of future revenues that must be raised through taxes.

Many intermediate definitions are clearly possible. We have chosen to use the IMF definition of government debt because it seems to correspond most closely to a definition that measures roughly the government incentives to inflate or, equivalently, the future revenues that must be raised with additional taxes. The government debt series reported in the International Financial Statistics (IFS) claims to represent the sum of all outstanding direct central government debt, regardless of the use to which the funds are put.

Sources of Data:

The IMF and the OECD appear to be the two major sources of data on government debt statistics. Of these the IMF publishes data that are most closely related to the needs in this paper. Government debt is available for all countries, except the U.K., in the IFS publication going back to 1952 (line 88). However, these data are supplied by central banks in most cases (France and the U.K. are exceptions), and they are not strictly comparable across countries. They involve approximations, a variety of assumptions, and projections. The Government Financial Statistics (GFS) of the IMF provides an alternative measure of central government debt (Table F, line I). These data are provided by the Finance ministries of various countries and they are much more closely controlled and verified. For instance, in the case of France and

Italy, GFS does not publish debt statistics because the IMF has not been able to reconcile the country accounts. [The IMF expects to publish data for France in 1984.] Both the IFS and the GFS debt figures refer to all government debt net of holdings of government agencies, but including debt held by the central bank. The major drawback of the GFS data is that they start in 1971.

OECD also publishes government debt figures in some cases, though the OECD statistics concentrate mostly on flow-of-funds accounting. We chose to use IMF sources because of relative ease of access, and because no obviously better alternative is available. Wherever available we use the IFS debt series.

The composition of debt varies across countries and over time. The government debt of the U.S., Germany, and Switzerland is all nominally denominated. The U.K. has issued variable rate bonds since 1978 and index-linked bonds since 1980. French government debt includes consols with indexed principal (last issued in 1973), variable-rate bonds and some gold-indexed bonds. The Italian government started issuing variable rate bonds in the middle '70's, and apparently the new bond issues are exclusively variable-rate instruments.

Additional sources of data for each country are listed below:

Banca d'Italia, Bolletino, various issues.

Banque de France, Bulletin Trimestriel, various issues.

Central Statistical Office, Annual Abstract of Statistics, (U.K.) various issues.

Institut National de la Statistique et des Etudes Economiques (1981), Le Mouvement Economique En France, 1949-1979.

International Monetary Fund, Government Finance Statistics Yearbook, various issues.

_____, International Financial Statistics, various issues.

OECD Publications, Financial Accounts of OECD Countries, various issues.

_____, Main Economic Indicators, various issues.

_____, Quarterly National Accounts, various issues.

FOOTNOTES

[1]Barro (1978), Niskanen (1978), Dwyer (1982), Joines (1984), and King and Plosser (1984) find no significant relation, while Hamburger and Zwick (1981), Levy (1981), and Allen and Smith (1983) find some relationship for parts of their sample.

[2]Strong support for this type of exploratory analysis is made by the statistician Tukey (1977).

[3]This viewpoint is perhaps still predominant in the academic literature. See Tobin (1969), Friedman (1983), and Feldstein (1982).

[4]The Ricardian viewpoint (Ricardo 1895, 1951)) was effectively revitalized by Barro (1974, 1978, 1979). See also Buchanan (1958), Thompson (1967), and O'Driscoll (1977). The real effects of government debt when agents have finite horizons was first analyzed by Diamond (1965) and more recently by Blanchard (1983). For some empirical test of the tax discounting hypothesis, see Kochin (1974), Seater (1982), Plosser (1982), and Kormendi (1983).

[5]A good summary of supply-side analysis and its relation to the deficit is given in Swartz, Bovello, and Kozak (1983).

[6]An excellent comprehensive description of these channels is found in Blinder (1982). Also see Aghevli and Khan (1978), Dornbusch and Fischer (1981), Hamburger and Zwick (1981), and Allen and Smith (1983).

[7]See the seminal work by Bailey (1956), and the important findings of Mundell (1963) and Sidrauski (1967) which describe the real effects of anticipated inflation.

[8]Phelps (1973), Siegel (1978), and Drazen (1979) have analyzed the effects of inflation in a tax framework. For the effect of anticipated inflation on capital formation, see Feldstein (1980) and Stein (1971). An analysis of the primary distribution effects of inflation is found in Benninga and Protopapadakis (1984).

[9]The important paper describing this effect clearly is Sargent and Wallace (1981). See also McCallum (1984), who derives the appropriate limiting conditions, and Buiter (1983).

[10]See Wallace (1981).

[11]Another source of an incentive to inflate at a rate greater than anticipated results from the government's attempt to lower unemployment by exploiting a short-run Phillips Curve.

[12]The "time inconsistency" problem was first elaborated by Kydland and Prescott (1977). See also Calvo (1978), Turnovsky and Brock (1980), and Lucas and Stokey (1983).

[13]For a discussion and analysis of some of these issues, see Bordo (1981). It may be that even adopting the gold standard does not enable the monetary authority to precommit monetary policy fully, because there is no way to guarantee that the monetary authority will not suspend the gold standard in the future.

[14]An important question is whether to use face value or market value of outstanding government debt as the relevant measure. We choose to analyze the face value for several reasons: (i) The face and market values contain exactly the same information in the long run; only the timing of the impact of the information differs. For instance, if interest rates rise, the market value of the long-term debt will fall immediately, but the face value will be unchanged. Through time, however, the face value will grow more slowly than it would have, had all the debt been short-term, because the interest payments the government has to make on the long-term debt are smaller. Over time the face and market values will converge. The one-time reduction in the market value of the debt is mirrored in a lower growth rate in the face value of debt over the maturity of the long-term bonds. (ii) Except for consol debt, the market value of the debt always tends to the face value through time because the maturing debt is refinanced at market rates. (iii) Data on market value of government debt are rare and sketchy at best, especially outside the U.S. See Seater (1981) and Butkiewicz (1983) for estimated market values for U.S. government debt.

[15]See Siegel (1979), Horrigan and Protopapadakis (1982), and Eisner and Pieper (1984).

[16]See Barro (1984) and Buiter (1983).

[17]The effect of nominal government debt on prices is analyzed by the neo-monetarists and described in Section I above.

[18]It is interesting to note such arguments were made by the German Central Bank and by German monetary theorists during the 1921-23 hyperinflation. They claimed that the ratio of gold to real money was actually increasing, making the deutschemark more valued than before. See Brescianni-Turroni (1937).

[19]We have a preference for analyzing the monetary base in this international setting for three reasons: (i) the base is more directly controlled by the monetary authority; (ii) there is less ambiguity, across countries, about the nature of assets that are included in the monetary base; and (iii) in empirical studies, the base is not consistently outperformed by other aggregates. See Ott (1982), Friedman (1981).

[20]For a description of the 200 year history of debt in the U.S. and the U.K., see Barro (1984). Joines (1984) gives an extensive 110-year analysis of U.S. data.

[21]For instance, to take an extreme example, if debt growth, $\dot{B}/B$, determines the growth rate of nominal GNP, then the growth rate of the velocity of money would simply be $\dot{B}/B - \dot{M}/M$ where $\dot{M}/M$ is the growth rate of the monetary aggregate.

[22]In a stochastic model, agents' beliefs about future monetization will occasionally turn out to be wrong. If, however, actual future monetization is never, or rarely, observed, it would be difficult to maintain this hypothesis.

[23]Many economists and market analysts attribute the persistent slowdown of real growth since 1974 to the substantial increase in the relative price of oil. For a discussion of these issues, see Darby (1982) and Hamilton (1983).

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TABLE 1

GROWTH RATES FOR VARIABLES FOR SEVEN COUNTRIES

	Equation (2)				Equation (5)				
	Debt/GNP =	Debt -	RGNP -	GNPDF	GNP =	Base +	Velocity GNP/Base =	M1 +	Velocity GNP/M1
Germany									
1952-62	1.5	11.2	7.4	2.3	9.7	9.6	0.0	10.0	-0.3
1962-74	-0.3	8.1	4.0	4.4	8.4	8.4	0.0	7.9	0.5
1974-82	12.1	18.2	1.8	4.2	6.0	4.7	1.4	6.7	-0.7
Japan									
1952-62	-15.6*	-2.7*	8.1	4.1	12.2	13.4*	-0.9*	14.0	-1.8
1962-74	6.9	22.2	8.9	6.5	15.4	17.0	-1.6	16.6	-1.2
1974-82	26.0*	35.8*	4.3	4.2	8.5	7.0	1.5	7.3	1.2
France									
1952-62	-1.2	7.9	5.3	3.8	9.1	8.7	0.4	11.3	-2.2
1962-74	-9.7	0.8	5.2	5.4	10.6	8.7	1.9	8.9	1.7
1974-82	6.4*	19.0*	2.3	10.5	12.8	5.6	7.2	10.3	2.5
Switzerland									
1952-62	n.a.	n.a.	4.9	2.3	7.2	6.4	0.8	5.9	1.3
1962-74	-6.0	3.3	3.8	5.5	9.2	7.5	1.7	6.5	2.7
1974-82	6.1*	9.2*	0.1	4.0	4.1	0.5	3.6	4.6	-0.5
Italy									
1952-62	-3.3	5.9	6.5	2.7	9.2	13.9*	-4.3*	10.8	-1.6
1962-74	2.2	13.3	4.6	6.5	11.2	12.1	-0.9	14.7	-3.5
1974-82	5.4	23.5	1.9	16.2	18.1	18.3	-0.3	16.4	1.7
U.S.									
1952-62	-3.5	1.4	2.9	2.0	4.8	0.5	4.4	1.8	3.0
1962-74	-4.8	2.9	3.7	4.1	7.8	5.8	2.0	5.1	2.7
1974-82	3.4	12.9	2.2	7.3	9.5	6.8	2.8	6.3	3.2
U.K.									
1952-62	-4.9*	0.9*	2.8	3.2	6.0	3.9	2.1	1.2	4.8
1962-74	-5.9	3.0	2.9	6.0	8.9	7.8	1.1	7.0	1.9
1974-82	-0.6*	15.0*	0.9	13.9	14.8	7.3	7.4	12.7	2.1

*NOTES:

JAPAN: Debt is 1955-79, Base is 1953-82.
FRANCE: Debt is 1952-81.
SWITZERLAND: Debt is 1960-80.
ITALY: Base is 1955-82.
U.K.: Debt is 1954-80.

GNP = Nominal GNP
RGNP = Real GNP
GNPDF = GNP Deflator

TABLE 2

CHANGES IN THE GROWTH RATES OF
DEBT, BASE, AND M1 BETWEEN 1962-74 AND 1974-82[a]

Country	DEBT		Base		M1	
Germany	+10.1	(+81)	-3.7	(-58)	-1.2	(-16)
Japan	+13.6	(+48)	-10.0	(-89)	-9.3	(-82)
Switzerland	+5.9	(+103)	-7.0	(-271)	-1.9	(-35)
France	+18.2	(+317)	-3.1	(-44)	+1.4	(+15)
U.K.	+12.0	(+161)	-0.5	(-7)	+5.7	(+60)
U.S.	+10.0	(+149)	+1.0	(+16)	+1.2	(+21)
Italy	+10.2	(+57)	+6.2	(+41)	+1.7	(+11)
Average	+11.4	(+131)	-2.4	(-59)	-0.3	(-4)

[a]The data show the percentage point change and the percentage change (in parentheses) between the 1962-74 period and the 1974-82 period. The percentage change figures are calculated as $\ell n(x_{t+1}/x_t)$.

TABLE 3
GROWTH RATE MATRICES

FRANCE
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	YEAR	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952	YEAR
	1952		16.9	10.6	11.8	10.5	10.7	10.3	9.9	5.6	6.3	6.4	8.3	8.5	7.5	7.5	7.2	7.4	7.9	7.8	7.6	7.8	7.8	1982
	1954	10.8		4.2	9.3	8.3	9.1	9.0	8.7	4.0	5.0	5.3	7.5	7.7	6.8	6.8	6.7	6.9	7.4	7.4	7.2	7.4	7.5	1981
	1956	10.3	9.8		14.3	10.4	10.8	10.2	9.6	3.9	5.1	5.4	7.8	8.1	7.0	7.0	6.8	7.1	7.6	7.5	7.3	7.6	7.7	1980
	1958	10.2	9.8	9.8		6.4	9.0	8.8	8.4	1.8	3.6	4.1	7.0	7.4	6.3	6.5	6.3	6.7	7.2	7.2	7.0	7.3	7.4	1979
F	1960	8.7	8.0	7.0	4.2		11.6	10.0	9.1	0.7	3.0	3.7	7.1	7.5	6.3	6.5	6.3	6.7	7.3	7.2	7.1	7.3	7.4	1978 F
I	1962	7.9	7.2	6.3	4.5	4.8		8.4	7.8	-3.0	0.9	2.1	6.4	6.9	5.8	6.0	5.9	6.3	7.0	7.0	6.9	7.2	7.3	1977 I M
N	1964	6.9	6.2	5.2	3.7	3.5	2.1		7.2	-8.6	-1.6	0.6	6.0	6.6	5.4	5.8	5.7	6.2	7.0	6.9	6.8	7.1	7.2	1976 N O
A	1966	5.3	4.4	3.3	1.7	0.8	-1.2	-4.5		-2.5	-6.0	-1.6	5.6	6.5	5.2	5.6	5.6	6.1	6.9	6.9	6.8	7.1	7.2	1975 A N
L	1968	5.8	5.1	4.3	3.2	2.9	2.3	2.3	9.2		12.4	9.8	15.7	14.3	10.1	9.4	8.6	8.7	9.2	8.9	8.5	8.7	8.7	1974 L E
D	1970	5.1	4.3	3.6	2.5	2.2	1.5	1.3	4.2	-0.7		7.2	17.3	14.9	9.7	8.9	8.2	8.3	8.9	8.6	8.3	8.5	8.5	1973 T
Y E	1971	4.7	4.0	3.2	2.2	1.8	1.1	0.8	3.0	-1.1	-2.0		27.4	18.7	10.3	9.2	8.3	8.4	9.1	8.7	8.3	8.5	8.6	1972 Y A
E B	1972	3.9	3.1	2.3	1.2	0.7	-0.1	-0.7	0.6	-3.7	-6.6	-1.1		10.0	4.5	5.6	5.5	6.3	7.4	7.3	7.1	7.4	7.6	1971 E R
A T	1973	3.7	2.9	2.1	1.1	0.6	-0.1	-0.6	0.5	-3.0	-4.6	-5.9	-0.5		1.8	4.4	4.8	5.9	7.1	7.1	6.8	7.3	7.4	1970 A Y
R	1974	4.1	3.4	2.7	1.8	1.4	0.8	0.6	1.9	-0.6	-0.5	0.0	5.6	11.7		7.1	6.3	7.2	8.5	8.1	7.7	8.1	8.1	1968 R
	1975	5.4	4.9	4.3	3.7	3.6	3.4	3.7	5.5	4.4	6.5	8.6	15.2	23.1	34.4		5.5	7.3	9.0	8.4	7.8	8.2	8.3	1966 B
F	1976	5.5	5.0	4.5	3.9	3.9	3.8	4.1	5.8	4.9	6.8	8.5	13.5	18.1	21.4	8.3		9.1	10.7	9.4	8.4	8.8	8.8	1964 F A
O	1977	5.7	5.3	4.8	4.3	4.3	4.3	4.6	6.3	5.6	7.4	9.0	13.0	16.4	17.9	9.7	11.1		12.3	9.5	8.2	8.7	8.7	1962 O S
R	1978	6.4	6.0	5.7	5.2	5.4	5.4	5.9	7.6	7.3	9.3	11.0	14.7	17.7	19.2	14.1	17.0	22.9		6.7	6.1	7.5	7.8	1960 R E
	1979	6.8	6.4	6.2	5.8	6.0	6.1	6.6	8.4	8.2	10.2	11.7	15.0	17.6	18.7	14.8	17.0	19.9	17.0		5.5	7.9	8.2	1958
	1980	7.2	6.9	6.6	6.3	6.6	6.7	7.3	9.0	9.0	10.9	12.4	15.3	17.6	18.5	15.4	17.1	19.1	17.3	17.6		10.3	9.5	1956
	1981	7.7	7.4	7.2	7.0	7.3	7.5	8.2	9.9	10.0	11.9	13.3	16.1	18.1	19.0	16.5	18.1	19.9	18.9	19.8	22.0		8.7	1954
	1982																							1952
	YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	YEAR

INITIAL YEAR FOR DEBT

FRANCE
GROWTH RATES FOR INFLATION AND REAL GDP

INITIAL YEAR FOR REAL GDP

FINAL YEAR FOR INFLATION	YEAR	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952	YEAR
	1952		1.8	1.0	1.0	1.6	2.0	2.2	2.6	2.3	2.4	2.7	3.0	3.1	3.6	3.7	3.8	4.0	4.2	4.5	4.4	4.5	4.4	1982
	1954	1.1		0.3	0.7	1.5	2.1	2.3	2.7	2.4	2.5	2.8	3.1	3.3	3.7	3.8	3.9	4.1	4.3	4.6	4.5	4.6	4.5	1981
	1956	2.3	3.5		1.1	2.2	2.7	2.8	3.2	2.7	2.8	3.1	3.4	3.6	4.0	4.1	4.2	4.4	4.5	4.8	4.7	4.7	4.7	1980
	1958	4.3	5.9	8.2		3.3	3.5	3.3	3.8	3.0	3.1	3.4	3.7	3.8	4.3	4.3	4.4	4.5	4.7	4.9	4.9	4.9	4.8	1979
F	1960	3.8	4.7	5.3	2.3		3.7	3.4	3.9	3.0	3.0	3.4	3.7	3.9	4.4	4.4	4.5	4.6	4.8	5.0	4.9	5.0	4.9	1978 F
I	1962	3.8	4.5	4.8	3.1	4.0		3.0	4.0	2.7	2.9	3.3	3.7	3.9	4.4	4.4	4.5	4.7	4.8	5.1	5.0	5.0	4.9	1977 I
N	1964	4.0	4.6	4.9	3.8	4.6	5.2		5.0	2.6	2.8	3.4	3.9	4.1	4.6	4.6	4.7	4.8	4.9	5.2	5.1	5.1	5.0	1976 N
A I	1966	3.8	4.3	4.4	3.5	3.9	3.9	2.6		0.2	1.7	2.9	3.6	3.9	4.6	4.5	4.6	4.8	4.9	5.2	5.1	5.1	5.0	1975 A R
L N	1968	3.8	4.2	4.3	3.5	3.8	3.8	3.1	3.7		3.2	4.2	4.7	4.9	5.3	5.1	5.1	5.2	5.3	5.5	5.4	5.4	5.2	1974 L E
F	1970	4.0	4.4	4.5	3.9	4.3	4.3	4.1	4.8	5.9		5.2	5.5	5.4	5.7	5.3	5.3	5.4	5.4	5.7	5.5	5.5	5.3	1973 A
Y L	1971	4.1	4.5	4.6	4.1	4.4	4.5	4.3	4.9	5.8	5.6		5.7	5.5	5.8	5.3	5.3	5.4	5.5	5.7	5.5	5.5	5.3	1972 Y L
E A	1972	4.2	4.6	4.7	4.2	4.5	4.6	4.5	5.1	5.9	5.8	6.0		5.3	5.9	5.3	5.2	5.3	5.4	5.7	5.5	5.5	5.3	1971 E
A T	1973	4.4	4.7	4.9	4.4	4.7	4.9	4.8	5.5	6.2	6.4	6.8	7.5		6.2	5.3	5.5	5.8	5.5	5.8	5.5	5.5	5.3	1970 A G
R I	1974	4.7	5.0	5.2	4.8	5.2	5.4	5.4	6.1	6.9	7.4	8.0	9.0	10.6		4.4	4.7	5.1	5.3	5.7	5.4	5.4	5.2	1968 R D
O	1975	5.0	5.4	5.6	5.3	5.7	5.9	6.1	6.8	7.7	8.4	9.2	10.2	11.6	12.6		5.0	5.4	5.6	6.0	5.6	5.6	5.3	1966 P
F N	1976	5.2	5.6	5.8	5.5	5.9	6.2	6.3	7.1	7.9	8.6	9.2	10.0	10.8	11.0	9.4		5.8	5.8	6.3	5.8	5.7	5.3	1964 F
O	1977	5.3	5.7	5.9	5.7	6.0	6.3	6.5	7.2	8.0	8.6	9.1	9.7	10.3	10.2	9.0	8.6		5.9	6.6	5.8	5.6	5.3	1962 O
R	1978	5.5	5.8	6.0	5.8	6.2	6.5	6.7	7.4	8.1	8.7	9.1	9.6	10.0	9.9	9.0	8.8	9.1		7.3	5.7	5.5	5.1	1960 R
	1979	5.6	6.0	6.2	6.0	6.4	6.7	6.9	7.6	8.3	8.8	9.2	9.7	10.0	9.9	9.2	9.2	9.5	9.9		4.2	4.7	4.4	1958
	1980	5.8	6.2	6.4	6.3	6.7	7.0	7.2	7.8	8.5	9.1	9.4	9.9	10.2	10.1	9.7	9.7	10.1	10.6	11.4		5.1	4.5	1956
	1981	6.0	6.4	6.6	6.5	6.9	7.2	7.4	8.1	8.7	9.3	9.6	10.0	10.3	10.3	9.9	10.0	10.4	10.9	11.3	11.3		3.8	1954
	1982	6.2	6.6	6.8	6.7	7.1	7.4	7.7	8.3	9.0	9.5	9.8	10.2	10.5	10.5	10.2	10.4	10.7	11.1	11.5	11.6	12.0		1952
	YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	YEAR

INITIAL YEAR FOR INFLATION

TABLE 4

GROWTH RATE MATRICES

GERMANY

GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		5.2	1.8	-0.1	1.2	3.4	4.1	4.9	4.7	4.0	4.3	6.1	6.7	7.4	6.7	6.7	6.9	6.7	7.2	7.5	7.6	7.8
1954	34.9		-1.6	-2.7	-0.1	3.0	3.9	4.9	4.6	3.9	4.2	6.2	6.9	7.6	6.8	6.8	7.0	6.7	7.2	7.6	7.7	7.9
1956	17.1	-0.8		-3.7	0.7	4.5	5.3	6.2	5.6	4.7	5.0	7.0	7.7	8.3	7.4	7.3	7.5	7.1	7.6	8.0	8.1	8.2
1958	13.6	2.9	6.6		5.0	8.7	8.3	8.7	7.5	6.1	6.2	8.4	9.0	9.4	8.3	8.0	8.1	7.7	8.2	8.5	8.6	8.7
1960	11.6	3.9	6.2	5.8		12.3	10.0	9.9	8.1	6.3	6.4	8.8	9.5	9.9	8.5	8.2	8.3	7.9	8.3	8.7	8.7	8.8
1962	11.2	5.3	7.3	7.6	9.5		7.6	8.7	6.7	4.8	5.2	8.3	9.1	9.6	8.2	7.9	8.0	7.6	8.1	8.5	8.6	8.7
1964	10.5	5.6	7.2	7.4	8.2	7.0		9.7	6.3	3.8	4.6	8.4	9.3	9.8	8.3	7.9	8.1	7.6	8.2	8.6	8.6	8.7
1966	9.9	5.7	7.0	7.2	7.6	6.7	6.4		2.8	0.8	2.9	8.1	9.3	9.9	8.1	7.8	8.0	7.5	8.1	8.5	8.5	8.7
1968	10.4	6.9	8.2	8.5	9.2	9.2	10.3	14.1		-1.1	3.0	9.8	10.9	11.0	8.7	8.3	8.4	7.8	8.4	8.8	8.8	9.0
1970	9.3	6.1	7.1	7.1	7.4	6.9	6.9	7.1	0.1		7.1	15.3	14.9	13.5	10.2	9.3	9.2	8.5	9.0	9.4	9.4	9.4
1971	9.0	5.9	6.8	6.8	7.0	6.5	6.3	6.3	1.1	3.0		23.4	18.7	15.1	10.7	9.6	9.5	8.6	9.2	9.5	9.5	9.6
1972	9.1	6.3	7.2	7.2	7.5	7.1	7.1	7.3	4.0	7.8	12.6		14.0	12.3	8.1	7.6	7.9	7.2	8.1	8.6	8.7	8.8
1973	9.2	6.5	7.3	7.4	7.7	7.4	7.5	7.8	5.3	8.7	11.5	10.4		11.4	6.6	6.5	7.1	6.6	7.6	8.2	8.3	8.5
1974	9.5	7.0	7.8	8.0	8.3	8.1	8.3	8.8	7.1	10.5	13.1	13.3	16.2		1.9	4.1	5.7	5.3	6.8	7.7	7.9	8.2
1975	10.9	8.6	9.6	9.9	10.5	10.6	11.3	12.4	11.9	16.6	20.0	22.5	28.5	40.8		6.3	7.6	6.5	8.1	8.9	8.9	9.1
1976	11.1	9.0	9.9	10.3	10.9	11.1	11.8	12.8	12.5	16.6	19.4	21.1	24.6	28.8	16.9		8.9	6.6	8.6	9.5	9.4	9.5
1977	11.3	9.2	10.2	10.6	11.2	11.4	12.1	13.1	12.9	16.5	18.7	20.0	22.4	24.4	16.2	15.6		4.2	8.5	9.7	9.5	9.6
1978	11.5	9.6	10.5	10.9	11.5	11.7	12.4	13.4	13.2	16.5	18.5	19.4	21.2	22.5	16.4	16.2	16.7		12.7	12.4	11.3	11.0
1979	11.6	9.7	10.6	11.0	11.6	11.8	12.4	13.4	13.2	16.2	17.8	18.6	19.9	20.7	15.6	15.2	15.0	13.2		12.2	10.6	10.4
1980	11.7	9.9	10.7	11.1	11.7	11.9	12.5	13.4	13.3	15.9	17.3	17.9	19.0	19.5	15.2	14.8	14.5	13.5	13.7		8.9	9.6
1981	11.8	10.1	11.0	11.3	11.9	12.1	12.7	13.6	13.5	15.9	17.2	17.7	18.7	19.0	15.4	15.1	15.0	14.4	14.9	16.2		10.2
1982	11.8	10.2	11.0	11.4	11.9	12.1	12.7	13.5	13.4	15.6	16.8	17.2	18.0	18.2	15.0	14.6	14.4	13.9	14.1	14.3	12.4	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR DEBT

GERMANY

GROWTH RATES FOR INFLATION AND REAL GNP

INITIAL YEAR FOR REAL GNP

FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		-1.1	-0.6	0.2	1.1	1.6	1.8	2.3	1.8	1.7	1.9	2.1	2.2	2.8	2.8	2.9	3.1	3.2	3.9	3.9	4.3	4.5
1954	-0.2		-0.2	0.8	1.8	2.2	2.3	2.8	2.2	2.0	2.3	2.4	2.5	3.1	3.0	3.2	3.3	3.4	4.1	4.1	4.5	4.7
1956	1.2	2.5		1.8	2.9	3.0	3.0	3.5	2.6	2.3	2.6	2.7	2.8	3.3	3.3	3.4	3.5	3.6	4.3	4.3	4.7	4.9
1958	1.8	2.9	3.2		3.9	3.7	3.3	3.9	2.8	2.4	2.7	2.9	2.9	3.5	3.4	3.5	3.6	3.7	4.4	4.4	4.8	5.0
1960	1.8	2.5	2.5	1.8		3.4	3.1	3.8	2.5	2.1	2.5	2.7	2.8	3.4	3.3	3.4	3.6	3.7	4.4	4.4	4.8	5.0
1962	2.3	2.9	3.1	3.0	4.1		2.7	4.1	2.2	1.8	2.3	2.6	2.7	3.4	3.3	3.4	3.6	3.7	4.5	4.5	4.9	5.1
1964	2.4	2.9	3.0	2.9	3.5	2.9		5.4	1.9	1.4	2.2	2.6	2.7	3.5	3.4	3.5	3.7	3.8	4.6	4.6	5.0	5.2
1966	2.6	3.0	3.1	3.1	3.5	3.2	3.5		-1.6	-0.6	1.1	1.8	2.1	3.2	3.2	3.3	3.5	3.7	4.5	4.5	5.0	5.2
1968	2.4	2.8	2.9	2.8	3.0	2.7	2.6	1.6		0.5	2.5	3.0	3.0	4.0	3.8	3.8	4.0	4.0	4.9	4.9	5.3	5.5
1970	2.8	3.2	3.3	3.3	3.6	3.4	3.6	3.6	5.7		4.5	4.3	3.9	4.8	4.2	4.2	4.3	4.3	5.2	5.1	5.6	5.8
1971	3.0	3.4	3.6	3.6	3.9	3.9	4.2	4.4	6.3	7.5		4.1	3.6	4.8	4.2	4.1	4.3	4.3	5.3	5.2	5.6	5.8
1972	3.2	3.5	3.7	3.7	4.0	4.0	4.3	4.6	6.0	6.4	5.2		3.1	5.1	4.2	4.2	4.3	4.3	5.4	5.3	5.7	5.9
1973	3.3	3.7	3.8	3.9	4.2	4.2	4.5	4.8	6.1	6.4	5.8	6.3		6.1	4.5	4.3	4.4	4.5	5.5	5.4	5.9	6.1
1974	3.5	3.8	4.0	4.1	4.4	4.4	4.7	5.0	6.2	6.4	6.0	6.4	6.5		2.9	3.5	3.9	4.0	5.4	5.3	5.9	6.1
1975	3.6	3.9	4.1	4.2	4.5	4.5	4.8	5.1	6.1	6.3	6.0	6.2	6.2	5.9		4.0	4.3	4.4	6.1	5.8	6.3	6.5
1976	3.6	3.9	4.0	4.1	4.4	4.4	4.7	4.9	5.8	5.8	5.5	5.5	5.3	4.6	3.4		4.7	4.6	6.8	6.2	6.8	6.9
1977	3.6	3.9	4.0	4.1	4.4	4.4	4.6	4.8	5.5	5.5	5.2	5.1	4.8	4.3	3.5	3.6		4.5	7.8	6.7	7.3	7.4
1978	3.6	3.9	4.0	4.1	4.3	4.4	4.6	4.8	5.4	5.3	5.0	5.0	4.7	4.2	3.7	3.9	4.1		11.0	7.8	8.3	8.1
1979	3.6	3.9	4.0	4.1	4.3	4.3	4.5	4.7	5.3	5.2	4.9	4.8	4.6	4.2	3.8	3.9	4.0	3.9		4.6	6.9	7.1
1980	3.6	3.9	4.0	4.1	4.3	4.3	4.5	4.7	5.2	5.1	4.8	4.8	4.5	4.2	3.9	4.0	4.1	4.1	4.4		9.2	8.4
1981	3.6	3.9	4.0	4.1	4.3	4.3	4.5	4.6	5.1	5.0	4.7	4.7	4.5	4.2	3.9	4.0	4.1	4.1	4.2	4.1		7.5
1982	3.7	3.9	4.1	4.1	4.3	4.3	4.5	4.6	5.1	5.0	4.7	4.7	4.5	4.2	4.0	4.1	4.2	4.3	4.4	4.4	4.6	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR INFLATION

TABLE 5

GROWTH RATE MATRICES

ITALY
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		13.9	13.3	12.7	13.0	15.0	15.2	15.7	18.3	17.7	17.9	17.1	17.0	16.3	15.5	14.9	14.6	14.6	13.6	14.4		
1954	8.5		12.7	12.1	12.7	15.3	15.4	16.0	19.0	18.2	18.3	17.4	17.3	16.5	15.6	14.9	14.6	14.6	13.6	14.4		
1956	7.4	6.2		11.5	12.7	16.1	16.1	16.7	20.0	18.9	19.0	17.9	17.7	16.8	15.8	15.1	14.7	14.7	13.7	14.5		
1958	6.5	5.5	4.8		14.0	18.4	17.6	18.0	21.7	20.2	20.1	18.7	18.4	17.3	16.1	15.3	14.9	14.9	13.8	14.6		
1960	6.1	5.4	4.9	5.1		22.9	19.5	19.3	23.7	21.4	21.1	19.4	19.0	17.6	16.3	15.4	15.0	14.9	13.7	14.7		
1962	5.9	5.2	4.9	4.9	4.8		16.0	17.6	23.9	21.0	20.7	18.9	18.4	17.0	15.7	14.8	14.4	14.5	13.3	14.3		
1964	6.1	5.6	5.5	5.7	6.1	7.3		19.1	27.9	22.7	21.9	19.4	18.8	17.1	15.6	14.7	14.3	14.4	13.1	14.2		
1966	7.0	6.8	6.9	7.4	8.2	9.9	12.6		36.7	24.5	22.8	19.5	18.7	16.8	15.2	14.3	14.0	14.1	12.8	13.9		
1968	7.4	7.2	7.4	7.9	8.6	9.8	11.1	9.7		12.4	15.9	13.8	14.3	13.5	12.6	12.1	12.1	12.4	11.3	12.7		
1970	7.8	7.7	7.9	8.5	9.2	10.2	11.2	10.5	11.4		19.4	14.5	14.9	13.7	12.6	12.1	12.0	12.4	11.2	12.7		
1971	8.4	8.4	8.7	9.3	10.0	11.2	12.3	12.2	13.8	18.7		9.5	12.6	12.3	11.4	11.1	11.3	11.9	10.6	12.3		
1972	8.9	9.0	9.3	10.0	10.8	12.0	13.1	13.3	15.2	18.9	19.2		15.7	13.3	11.8	11.4	11.5	12.1	10.7	12.4		
1973	9.5	9.6	10.0	10.7	11.6	12.8	14.1	14.5	16.4	19.7	20.3	21.3		12.0	10.8	10.6	11.0	11.7	10.3	12.2		
1974	9.9	10.1	10.5	11.2	12.1	13.3	14.5	15.0	16.8	19.5	19.8	20.1	18.9		9.7	9.9	10.6	11.6	9.9	12.2		
1975	10.7	10.9	11.4	12.2	13.2	14.5	15.8	16.5	18.4	21.2	21.9	22.8	23.5	28.1		10.2	11.1	12.3	10.0	12.8		
1976	11.1	11.3	11.8	12.6	13.6	14.8	16.1	16.8	18.6	21.0	21.4	22.0	22.2	23.8	19.5		12.0	13.3	9.9	13.4		
1977	11.6	11.9	12.4	13.3	14.2	15.5	16.7	17.5	19.2	21.5	21.9	22.5	22.7	24.0	22.0	24.4		14.7	8.9	13.9		
1978	12.3	12.6	13.2	14.0	15.0	16.3	17.6	18.4	20.1	22.3	22.8	23.5	23.9	25.1	24.1	26.4	28.4		3.0	13.4		
1979	12.6	12.9	13.5	14.3	15.3	16.5	17.7	18.5	20.1	22.0	22.4	22.9	23.2	24.0	23.0	24.2	24.1	19.7		23.9		
1980	12.8	13.1	13.7	14.5	15.5	16.7	17.8	18.6	20.1	21.8	22.2	22.5	22.7	23.3	22.4	23.1	22.6	19.7	19.8			
1981	13.2	13.5	14.1	14.9	15.8	17.0	18.1	18.9	20.3	21.9	22.2	22.6	22.7	23.3	22.5	23.1	22.7	20.8	21.4	23.0		
1982	13.6	13.9	14.5	15.3	16.2	17.4	18.5	19.3	20.6	22.2	22.5	22.8	23.0	23.5	22.8	23.4	23.2	21.8	22.6	23.9	24.9	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR DEBT

ITALY
GROWTH RATES FOR INFLATION AND REAL GDP

INITIAL YEAR FOR REAL GDP

FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		-0.3	-0.1	1.2	2.1	2.2	2.2	2.7	1.9	2.1	2.6	2.6	2.5	3.0	3.4	3.5	3.5	3.8	4.3	4.4	4.4	4.5
1954	2.8		0.1	2.0	2.9	2.9	2.7	3.2	2.2	2.4	2.9	2.9	2.8	3.2	3.7	3.7	3.7	4.0	4.5	4.5	4.6	4.7
1956	3.2	3.6		3.8	4.3	3.8	3.3	3.8	2.5	2.7	3.3	3.2	3.1	3.5	3.9	3.9	3.9	4.2	4.7	4.7	4.8	4.8
1958	2.9	2.9	2.2		4.8	3.7	3.1	3.8	2.3	2.6	3.2	3.2	3.0	3.5	3.9	3.9	3.9	4.3	4.8	4.8	4.8	4.9
1960	2.4	2.2	1.5	0.9		2.6	2.3	3.4	1.6	2.1	2.9	2.9	2.8	3.3	3.9	3.9	3.9	4.2	4.8	4.8	4.8	4.9
1962	2.7	2.7	2.4	2.5	4.2		1.9	3.8	1.3	2.0	2.9	3.0	2.8	3.4	4.0	4.0	4.0	4.3	4.9	4.9	4.9	5.0
1964	3.5	3.6	3.6	4.1	5.7	7.3		5.7	1.0	2.0	3.2	3.2	2.9	3.6	4.2	4.1	4.1	4.5	5.0	5.0	5.1	5.1
1966	3.5	3.7	3.7	4.1	5.1	5.6	3.9		-3.7	0.2	2.4	2.6	2.4	3.3	4.0	4.0	4.0	4.4	5.0	5.0	5.0	5.1
1968	3.4	3.5	3.4	3.7	4.4	4.5	3.0	2.2		4.1	5.4	4.7	3.9	4.5	5.0	4.8	4.6	5.0	5.5	5.5	5.5	5.5
1970	3.6	3.7	3.7	4.0	4.6	4.7	3.8	3.8	5.3		6.8	5.0	3.9	4.5	5.1	4.8	4.7	5.0	5.6	5.6	5.5	5.5
1971	3.8	3.9	3.9	4.2	4.8	4.9	4.2	4.4	5.9	6.9		3.2	2.4	4.0	4.9	4.6	4.5	4.9	5.5	5.5	5.5	5.5
1972	3.9	4.0	4.1	4.3	4.9	5.0	4.5	4.7	5.9	6.5	6.1		1.6	4.2	5.2	4.8	4.6	5.1	5.7	5.6	5.6	5.6
1973	4.2	4.4	4.5	4.8	5.4	5.6	5.2	5.6	6.9	8.0	8.5	11.0		5.5	6.1	5.3	5.0	5.4	6.1	5.9	5.9	5.8
1974	4.8	5.0	5.2	5.5	6.2	6.5	6.4	7.0	8.6	10.2	11.3	14.0	16.9		6.6	5.2	4.8	5.4	6.2	6.0	5.9	5.8
1975	5.3	5.5	5.7	6.2	6.9	7.3	7.3	8.0	9.7	11.4	12.5	14.7	16.5	16.1		3.8	3.9	4.9	6.1	5.8	5.8	5.7
1976	5.8	6.0	6.3	6.7	7.5	7.9	8.0	8.9	10.5	12.3	13.3	15.2	16.5	16.4	16.6		4.0	5.5	6.8	6.3	6.2	6.1
1977	6.2	6.5	6.8	7.3	8.0	8.6	8.8	9.7	11.3	13.0	14.0	15.6	16.8	16.7	17.0	17.5		7.0	8.2	7.1	6.7	6.5
1978	6.5	6.8	7.1	7.6	8.3	8.8	9.1	9.9	11.5	13.0	13.9	15.2	16.0	15.8	15.7	15.2	13.0		9.5	7.2	6.6	6.3
1979	6.8	7.1	7.4	7.9	8.7	9.2	9.4	10.3	11.8	13.2	14.0	15.1	15.8	15.6	15.4	15.1	13.9	14.7		5.0	5.2	5.3
1980	7.2	7.6	7.9	8.4	9.2	9.7	10.0	10.9	12.4	13.8	14.5	15.6	16.2	16.1	16.1	16.0	15.5	16.8	18.8		5.5	5.5
1981	7.6	7.9	8.3	8.8	9.5	10.1	10.4	11.3	12.7	14.0	14.7	15.7	16.3	16.2	16.2	16.2	15.8	16.8	17.8	16.8		5.4
1982	7.8	8.2	8.6	9.1	9.8	10.4	10.7	11.6	12.9	14.2	14.9	15.8	16.3	16.2	16.2	16.1	15.9	16.6	17.2	16.5	16.1	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR INFLATION

TABLE 6

GROWTH RATE MATRICES

JAPAN
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		6.0	4.3	5.0	5.5	7.2	7.3	7.5	7.0	7.9	10.1	11.5	11.6	12.4	12.9	12.7	13.0	13.3	13.7	13.2	13.1	
1954			2.6	4.4	5.3	7.5	7.6	7.7	7.2	8.1	10.5	12.0	12.1	12.8	13.4	13.1	13.3	13.7	14.0	13.5	13.4	
1956				6.2	6.7	9.1	8.8	8.7	7.9	8.9	11.5	13.0	13.1	13.7	14.2	13.7	13.9	14.2	14.6	13.9	13.8	
1958			-2.7		7.2	10.5	9.7	9.3	8.3	9.4	12.3	13.9	13.9	14.4	14.8	14.2	14.4	14.7	15.0	14.2	14.1	
1960			0.8	4.3		13.9	10.9	10.0	8.5	9.8	13.1	14.9	14.7	15.1	15.4	14.7	14.8	15.1	15.3	14.6	14.4	
1962			-2.7	-2.8	-9.8		8.0	8.1	6.7	8.8	12.9	15.0	14.8	15.2	15.6	14.8	14.9	15.1	15.4	14.6	14.4	
1964			2.5	4.3	4.3	18.4		8.2	6.1	9.1	14.2	16.4	16.0	16.1	16.3	15.4	15.4	15.6	15.8	14.9	14.7	
1966			10.1	13.3	16.3	29.3	40.1		4.0	9.5	16.1	18.5	17.5	17.2	17.2	16.0	16.0	16.1	16.3	15.3	15.0	
1968			13.0	16.1	19.0	28.6	33.8	27.4		15.0	22.2	23.3	20.9	19.5	18.9	17.2	17.0	16.9	17.0	15.9	15.5	
1970			12.8	15.4	17.7	24.5	26.6	19.8	12.2		29.5	27.5	22.8	20.4	19.4	17.5	17.1	17.1	17.2	16.0	15.6	
1971			12.4	14.8	16.7	22.5	23.7	17.2	10.3	6.6		25.5	19.5	18.1	17.8	16.0	15.9	16.1	16.3	15.1	14.8	
1972			13.2	15.5	17.4	22.8	23.9	18.5	14.1	15.9	25.3		13.6	15.6	16.2	14.6	14.8	15.2	15.6	14.4	14.2	
1973			13.3	15.4	17.1	22.0	22.8	17.9	14.1	15.3	19.7	14.0		16.6	16.9	14.8	15.0	15.4	15.8	14.5	14.2	
1974			13.9	16.0	17.7	22.2	23.0	18.7	15.8	17.7	21.4	19.4	24.7		17.1	13.9	14.4	15.1	15.6	14.1	13.8	
1975			15.6	17.7	19.5	24.1	25.1	21.7	20.1	23.3	27.5	28.2	35.3	45.8		10.7	13.1	14.4	15.2	13.5	13.3	
1976			16.4	18.5	20.3	24.6	25.7	22.8	21.6	24.8	28.4	29.2	34.2	39.0	32.1		15.5	16.2	16.7	14.2	13.8	
1977			17.7	19.9	21.7	25.9	27.1	24.7	24.1	27.5	30.9	32.1	36.6	40.5	37.9	43.7		16.9	17.3	13.8	13.4	
1978			18.5	20.6	22.4	26.4	27.6	25.5	25.1	28.4	31.5	32.5	36.2	39.0	36.6	39.1	34.6		17.7	12.3	12.2	
1979			18.7	20.7	22.4	26.2	27.3	25.3	24.9	27.7	30.4	31.1	34.0	35.8	33.3	33.7	28.7	22.8		6.8	9.5	
1980																					12.2	
1981																						
1982																						
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR DEBT

JAPAN
GROWTH RATES FOR INFLATION AND REAL GNP

INITIAL YEAR FOR REAL GNP

FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		2.9	3.3	3.8	4.1	4.3	4.4	4.5	4.3	3.7	4.1	4.5	4.5	5.4	6.1	6.6	7.0	7.3	7.6	7.5	7.5	7.4
1954	5.3		3.8	4.2	4.5	4.6	4.7	4.8	4.5	3.8	4.3	4.7	4.7	5.6	6.3	6.8	7.3	7.5	7.8	7.7	7.7	7.6
1956	4.2	3.1		4.7	4.9	4.9	5.0	5.0	4.6	3.7	4.3	4.8	4.8	5.7	6.5	7.0	7.5	7.7	8.0	7.8	7.8	7.7
1958	3.5	2.6	2.2		5.1	5.0	5.1	5.1	4.6	3.6	4.3	4.8	4.8	5.8	6.6	7.1	7.6	7.9	8.1	8.0	8.0	7.8
1960	3.7	3.2	3.2	4.3		5.0	5.1	5.1	4.4	3.3	4.2	4.8	4.8	5.9	6.8	7.3	7.8	8.0	8.3	8.1	8.1	7.9
1962	4.1	3.8	4.0	4.9	5.6		5.2	5.2	4.2	2.9	4.0	4.8	4.7	6.0	6.9	7.5	8.0	8.2	8.5	8.3	8.2	8.0
1964	4.1	3.9	4.1	4.7	5.0	4.4		5.2	3.8	2.1	3.7	4.7	4.7	6.1	7.1	7.7	8.2	8.4	8.6	8.4	8.4	8.1
1966	4.0	3.8	3.9	4.3	4.4	3.8	3.2		2.4	0.6	3.2	4.5	4.6	6.3	7.3	7.9	8.4	8.6	8.8	8.6	8.5	8.3
1968	4.2	4.0	4.1	4.5	4.6	4.3	4.3	5.3		-1.2	3.6	5.3	5.1	6.9	7.9	8.4	8.9	9.1	9.2	8.9	8.8	8.5
1970	4.3	4.2	4.4	4.8	4.9	4.7	4.8	5.6	5.9		8.5	8.5	7.2	8.5	9.3	9.5	9.8	9.9	9.9	9.5	9.3	9.0
1971	4.4	4.3	4.4	4.8	4.9	4.7	4.8	5.5	5.6	5.0		8.6	6.6	8.5	9.4	9.6	9.9	10.0	10.1	9.6	9.4	9.0
1972	4.4	4.3	4.5	4.8	4.9	4.8	4.9	5.4	5.5	5.1	5.1		4.6	8.5	9.6	9.8	10.1	10.1	10.2	9.7	9.4	9.1
1973	4.7	4.7	4.9	5.2	5.4	5.4	5.6	6.3	6.6	7.1	8.2	11.3		10.5	10.8	10.7	10.8	10.7	10.6	10.0	9.7	9.3
1974	5.4	5.4	5.6	6.1	6.3	6.5	6.9	7.8	8.6	10.0	11.7	15.0	18.7		11.1	10.7	10.9	10.7	10.7	9.9	9.6	9.2
1975	5.5	5.5	5.7	6.2	6.4	6.6	6.9	7.8	8.5	9.5	10.6	12.5	13.1	7.5		10.4	10.8	10.6	10.6	9.7	9.4	8.9
1976	5.5	5.5	5.8	6.2	6.4	6.5	6.9	7.6	8.2	9.0	9.8	10.9	10.8	6.9	6.2		11.1	10.7	10.6	9.5	9.2	8.6
1977	5.5	5.5	5.8	6.1	6.4	6.5	6.8	7.4	7.9	8.5	9.1	9.8	9.5	6.4	5.9	5.5		10.2	10.3	9.0	8.7	8.1
1978	5.5	5.5	5.7	6.1	6.2	6.3	6.6	7.2	7.6	8.0	8.4	9.0	8.5	5.9	5.4	5.0	4.5		10.5	8.4	8.2	7.6
1979	5.4	5.4	5.6	5.9	6.1	6.1	6.3	6.8	7.1	7.4	7.7	8.0	7.5	5.3	4.7	4.2	3.5	2.6		6.3	7.0	6.6
1980	5.3	5.3	5.4	5.7	5.9	5.9	6.1	6.5	6.7	6.9	7.1	7.4	6.8	4.8	4.3	3.8	3.3	2.7	2.8		7.8	6.8
1981	5.2	5.2	5.3	5.6	5.7	5.8	5.9	6.3	6.4	6.5	6.7	6.9	6.3	4.5	4.0	3.6	3.1	2.6	2.7	2.6		5.9
1982	5.1	5.1	5.2	5.5	5.6	5.6	5.7	6.0	6.1	6.2	6.3	6.4	5.8	4.2	3.7	3.3	2.9	2.5	2.5	2.3	2.0	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR INFLATION

TABLE 7

GROWTH RATE MATRICES

SWITZERLAND
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		-1.4	-9.4	-5.8	-6.4	-1.9	-1.0	0.2	0.5	0.8	1.1	1.7	3.0	3.9	4.5	4.4	4.7	5.4	5.3	5.5	5.4	5.3
1954			-4.3	-1.5	-3.7	1.2	1.7	2.7	2.6	2.7	2.8	3.3	4.5	5.3	5.8	5.5	5.7	6.3	6.2	6.3	6.2	5.9
1956				1.4	-3.4	3.1	3.2	4.1	3.8	3.7	3.7	4.1	5.4	6.1	6.5	6.1	6.3	6.8	6.6	6.7	6.6	6.3
1958					-8.1	4.0	3.8	4.7	4.2	4.1	4.0	4.5	5.9	6.5	6.5	6.5	6.6	7.1	6.9	7.0	6.8	6.5
1960						16.0	9.8	9.0	7.3	6.5	6.1	6.3	7.6	7.9	8.2	7.5	7.5	8.0	7.6	7.7	7.4	7.1
1962					-4.1		3.5	5.5	4.4	4.2	4.1	4.7	6.4	7.0	7.5	6.9	6.9	7.5	7.2	7.3	7.0	6.7
1964					-3.5	-2.9		7.5	4.9	4.4	4.2	4.9	6.9	7.5	7.9	7.1	7.1	7.7	7.4	7.4	7.2	6.8
1966					-3.4	-3.1	-3.4		2.3	2.8	3.1	4.2	6.8	7.5	7.9	7.1	7.1	7.8	7.4	7.4	7.2	6.8
1968					-2.0	-1.3	-0.5	2.5		3.3	3.5	4.9	7.9	8.3	8.6	7.6	7.5	8.2	7.7	7.7	7.4	7.0
1970					-1.1	-0.3	0.5	2.5	2.6		3.7	5.7	9.4	9.4	9.4	8.1	7.9	8.5	8.0	8.0	7.6	7.2
1971					-0.1	0.7	1.8	3.8	4.8	9.1		7.6	12.3	10.8	10.3	8.6	8.3	8.9	8.3	8.2	7.9	7.4
1972					0.3	1.2	2.2	4.1	4.9	7.3	5.4		17.0	11.8	10.8	8.7	8.4	9.0	8.4	8.3	7.9	7.3
1973					0.7	1.5	2.5	4.2	4.9	6.5	5.1	4.8		9.2	9.3	7.4	7.3	8.3	7.7	7.7	7.3	6.8
1974					2.2	3.3	4.5	6.5	7.8	10.4	10.9	13.6	22.3		9.4	6.4	6.7	8.0	7.4	7.4	7.0	6.5
1975					3.8	5.1	6.5	8.7	10.5	13.6	14.7	17.8	24.4	26.4		3.5	5.4	7.6	6.9	7.0	6.6	6.1
1976					5.4	6.8	8.4	10.8	12.9	16.3	17.7	20.8	26.1	28.0	29.6		7.3	9.6	8.0	7.9	7.3	6.5
1977					5.1	6.3	7.8	9.8	11.4	13.9	14.7	16.6	19.5	18.6	14.7	-0.2		11.9	8.3	8.1	7.3	6.4
1978					4.6	5.7	6.9	8.6	9.8	11.6	12.0	13.1	14.7	12.8	8.3	-2.3	-4.5		4.8	6.2	5.7	5.0
1979					4.4	5.4	6.5	8.0	9.0	10.4	10.6	11.3	12.4	10.4	6.4	-1.3	-1.9	0.7		7.7	6.2	5.1
1980					4.3	5.3	6.3	7.7	8.5	9.7	9.8	10.3	11.1	9.2	5.8	-0.1	-0.1	2.1	3.4		4.7	3.8
1981																						2.9
1982																						
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR DEBT

SWITZERLAND
GROWTH RATES FOR INFLATION AND REAL GDP

INITIAL YEAR FOR REAL GDP

FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		-1.7	0.1	1.6	1.8	1.5	1.7	1.2	0.1	0.3	0.5	0.8	1.0	1.7	1.9	2.0	2.3	2.7	3.0	2.8	3.1	3.2
1954	0.8		1.9	3.2	2.9	2.3	2.3	1.7	0.4	0.5	0.8	1.1	1.3	2.0	2.2	2.2	2.5	2.9	3.2	3.0	3.3	3.3
1956	0.9	1.0		4.5	3.5	2.5	2.4	1.7	0.1	0.3	0.7	1.0	1.2	2.0	2.2	2.3	2.6	2.9	3.2	3.0	3.3	3.4
1958	1.8	2.3	3.6		2.4	1.4	1.7	1.0	-0.7	-0.4	0.1	0.5	0.9	1.8	2.0	2.1	2.4	2.8	3.2	3.0	3.3	3.3
1960	1.7	2.0	2.4	1.3		0.4	1.4	0.5	-1.5	-0.9	-0.3	0.3	0.7	1.7	2.0	2.1	2.4	2.9	3.2	3.0	3.3	3.4
1962	2.3	2.7	3.2	3.1	4.8		2.4	0.6	-2.2	-1.3	-0.4	0.2	0.7	1.9	2.1	2.2	2.6	3.0	3.4	3.1	3.4	3.5
1964	2.7	3.1	3.7	3.7	4.9	4.9		-1.2	-4.5	-2.5	-1.1	-0.2	0.4	1.8	2.1	2.2	2.6	3.0	3.4	3.2	3.5	3.6
1966	3.0	3.3	3.8	3.8	4.7	4.6	4.3		-7.7	-3.2	-1.1	0.1	0.8	2.2	2.5	2.5	2.9	3.3	3.7	3.4	3.7	3.8
1968	3.0	3.4	3.8	3.8	4.4	4.3	4.0	3.6		1.4	2.2	2.7	2.9	3.9	3.7	3.5	3.8	4.1	4.4	4.0	4.3	4.3
1970	3.1	3.4	3.7	3.8	4.2	4.1	3.8	3.6	3.6		3.0	3.3	3.4	4.4	4.1	3.8	4.0	4.3	4.6	4.2	4.4	4.4
1971	3.4	3.7	4.1	4.2	4.7	4.7	4.6	4.7	5.4	9.1		3.5	3.6	4.7	4.2	3.9	4.1	4.4	4.7	4.2	4.5	4.5
1972	3.7	4.0	4.4	4.5	5.0	5.1	5.1	5.4	6.3	9.0	9.0		3.6	5.1	4.4	3.9	4.1	4.5	4.8	4.3	4.5	4.5
1973	3.9	4.2	4.6	4.7	5.3	5.4	5.4	5.8	6.6	8.6	8.4	7.8		5.8	4.6	4.0	4.2	4.6	4.9	4.3	4.6	4.6
1974	4.0	4.3	4.7	4.9	5.4	5.5	5.6	5.9	6.6	8.1	7.8	7.3	6.7		3.3	3.0	3.7	4.3	4.7	4.1	4.4	4.4
1975	4.2	4.5	4.8	5.0	5.5	5.6	5.7	6.0	6.7	7.9	7.6	7.2	6.9	7.1		2.7	3.9	4.6	5.1	4.2	4.6	4.6
1976	4.1	4.4	4.7	4.9	5.3	5.4	5.4	5.7	6.2	7.0	6.6	6.0	5.4	4.8	2.5		5.0	5.6	5.9	4.6	5.0	4.9
1977	3.9	4.2	4.5	4.6	5.0	5.0	5.0	5.2	5.5	6.1	5.6	4.9	4.1	3.3	1.4	0.3		6.2	6.3	4.5	5.0	4.9
1978	3.9	4.2	4.5	4.6	4.9	4.9	4.9	5.0	5.3	5.8	5.3	4.7	4.0	3.4	2.1	1.9	3.5		6.5	3.7	4.6	4.6
1979	3.8	4.1	4.4	4.4	4.8	4.8	4.7	4.8	5.0	5.3	4.9	4.3	3.7	3.1	2.1	1.9	2.7	2.0		0.8	3.7	3.9
1980	3.8	4.0	4.3	4.4	4.7	4.6	4.6	4.6	4.8	5.1	4.6	4.1	3.5	3.0	2.2	2.1	2.7	2.3	2.7		6.5	5.5
1981	3.9	4.1	4.4	4.5	4.8	4.8	4.7	4.8	5.0	5.2	4.8	4.4	3.9	3.5	2.9	3.0	3.7	3.8	4.7	6.7		4.4
1982	4.0	4.2	4.5	4.6	4.9	4.9	4.9	4.9	5.1	5.4	5.0	4.6	4.3	4.0	3.6	3.7	4.4	4.6	5.5	7.0	7.2	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR INFLATION

TABLE 8

GROWTH RATE MATRICES

UNITED KINGDOM
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		4.2	4.4	1.9	3.8	4.9	4.9	6.9	7.3	7.0	9.0	9.9	8.7	8.4	7.8	7.9	7.6	7.2	6.9	6.6	6.5	6.4
1954			4.5	0.7	3.6	5.1	5.1	7.3	7.8	7.3	9.5	10.5	9.1	8.7	8.1	8.1	7.8	7.3	7.0	6.7	6.5	6.5
1956		0.8		-3.1	3.2	5.3	5.2	7.8	8.3	7.7	10.2	11.2	9.5	9.0	8.3	8.3	8.0	7.4	7.1	6.8	6.6	6.5
1958		0.6	0.4		9.4	9.4	8.0	10.6	10.6	9.5	12.1	13.0	10.9	10.1	9.2	9.0	8.6	8.0	7.6	7.3	7.0	6.9
1960		0.7	0.6	0.9		9.5	7.3	11.0	10.9	9.5	12.5	13.5	11.1	10.2	9.2	9.0	8.6	7.9	7.5	7.2	6.9	6.8
1962		0.9	1.0	1.3	1.7		5.1	11.7	11.4	9.5	13.1	14.1	11.4	10.3	9.2	9.0	8.5	7.8	7.4	7.1	6.8	6.7
1964		1.3	1.4	1.7	2.2	2.6		18.3	14.5	11.0	15.1	15.9	12.4	10.9	9.6	9.3	8.8	8.0	7.5	7.2	6.9	6.7
1966		1.4	1.5	1.8	2.0	2.2	1.8		10.8	7.4	14.1	15.3	11.2	9.9	8.6	8.5	8.0	7.3	6.9	6.6	6.3	6.2
1968		1.7	1.9	2.2	2.5	2.8	2.8	3.8		4.0	15.7	16.9	11.3	9.7	8.3	8.3	7.8	7.0	6.7	6.3	6.1	6.0
1970		1.3	1.4	1.5	1.7	1.6	1.3	1.1	-1.7		27.4	23.3	13.8	10.9	9.0	8.7	8.1	7.3	6.8	6.5	6.2	6.1
1971		1.3	1.4	1.5	1.6	1.6	1.3	1.1	-0.6	1.4		19.2	7.0	6.7	5.9	6.4	6.2	5.6	5.4	5.2	5.0	5.1
1972		1.7	1.8	2.0	2.2	2.3	2.2	2.3	1.6	4.8	8.2		-5.3	2.6	3.2	4.6	4.8	4.4	4.3	4.2	4.2	4.3
1973		1.8	1.9	2.1	2.3	2.4	2.4	2.5	2.0	4.5	6.0	3.8		6.5	5.3	6.2	6.0	5.3	5.1	4.9	4.8	4.9
1974		2.2	2.3	2.5	2.8	3.0	3.0	3.3	3.2	5.6	7.0	6.4	9.0		4.2	6.1	5.9	5.0	4.8	4.6	4.5	4.7
1975		2.6	2.8	3.1	3.4	3.7	3.9	4.3	4.5	6.9	8.3	8.3	10.6	12.2		7.9	6.7	5.3	5.0	4.7	4.6	4.7
1976		3.4	3.7	4.0	4.4	4.8	5.2	5.9	6.4	9.1	10.6	11.2	13.7	16.0	19.8		5.5	4.0	4.0	3.9	3.9	4.2
1977		4.0	4.3	4.7	5.2	5.6	6.1	6.9	7.5	10.2	11.6	12.3	14.4	16.2	18.3	16.7		2.6	3.3	3.4	3.5	3.9
1978		4.5	4.9	5.3	5.8	6.3	6.9	7.7	8.5	11.0	12.4	13.1	15.0	16.5	17.9	16.9	17.2		4.0	3.9	3.9	4.3
1979		4.8	5.1	5.6	6.1	6.6	7.1	7.9	8.7	10.9	12.1	12.7	14.2	15.2	16.0	14.7	13.7	10.3		3.8	3.8	4.4
1980		5.0	5.3	5.8	6.3	6.8	7.3	8.1	8.8	10.9	11.9	12.4	13.6	14.4	14.8	13.6	12.5	10.2	10.1		3.9	4.7
1981		5.5	5.8	6.3	6.8	7.4	7.9	8.8	9.5	11.6	12.6	13.1	14.2	15.0	15.4	14.5	14.0	13.0	14.3	18.5		5.5
1982																						
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR DEBT

UNITED KINGDOM
GROWTH RATES FOR INFLATION AND REAL GDP

INITIAL YEAR FOR REAL GDP

FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952
1952		1.5	-0.3	-0.8	-0.2	0.6	0.7	1.1	0.9	0.7	1.3	1.4	1.5	1.5	1.8	1.8	2.1	2.1	2.3	2.2	2.2	2.3
1954	2.3		-2.1	-2.0	-0.8	0.3	0.5	1.0	0.8	0.6	1.3	1.4	1.5	1.5	1.8	1.8	2.1	2.1	2.3	2.2	2.2	2.4
1956	3.6	4.9		-1.9	-0.1	1.1	1.2	1.6	1.3	0.9	1.7	1.7	1.8	1.8	2.1	2.1	2.4	2.3	2.5	2.4	2.4	2.5
1958	3.7	4.4	3.9		1.6	2.6	2.2	2.5	1.9	1.4	2.2	2.2	2.2	2.2	2.4	2.3	2.6	2.6	2.7	2.6	2.6	2.7
1960	3.1	3.4	2.6	1.3		3.6	2.4	2.8	2.0	1.3	2.3	2.3	2.3	2.2	2.4	2.4	2.7	2.6	2.8	2.6	2.6	2.7
1962	3.2	3.4	2.9	2.4	3.5		1.3	2.4	1.4	0.8	2.1	2.1	2.1	2.1	2.3	2.3	2.6	2.5	2.7	2.5	2.6	2.7
1964	3.1	3.3	2.9	2.6	3.2	2.9		3.5	1.5	0.6	2.3	2.2	2.3	2.2	2.4	2.4	2.7	2.6	2.8	2.6	2.6	2.7
1966	3.3	3.5	3.2	3.1	3.7	3.7	4.6		-0.6	-0.8	1.9	1.9	2.0	2.0	2.3	2.3	2.6	2.6	2.8	2.6	2.6	2.7
1968	3.3	3.5	3.3	3.1	3.6	3.6	4.0	3.4		-1.1	3.1	2.7	2.7	2.4	2.7	2.6	2.9	2.8	3.0	2.7	2.7	2.9
1970	3.7	3.8	3.7	3.6	4.1	4.3	4.7	4.8	6.2		7.3	4.6	3.9	3.1	3.2	3.0	3.3	3.1	3.2	3.0	2.9	3.0
1971	3.9	4.1	4.0	4.1	4.6	4.8	5.3	5.6	7.1	8.9		1.9	2.3	2.1	2.5	2.4	2.9	2.7	2.9	2.7	2.7	2.8
1972	4.2	4.4	4.3	4.3	4.9	5.1	5.7	6.0	7.4	8.5	8.2		2.6	2.1	2.6	2.5	3.0	2.8	3.0	2.7	2.7	2.9
1973	4.3	4.5	4.4	4.5	5.0	5.3	5.8	6.1	7.3	7.9	7.5	6.8		1.8	2.6	2.5	3.0	2.8	3.1	2.8	2.7	2.9
1974	4.7	5.0	5.0	5.1	5.6	6.0	6.6	7.1	8.4	9.5	9.6	10.4	14.0		3.4	2.8	3.4	3.1	3.3	2.9	2.9	3.0
1975	5.5	5.9	6.0	6.2	6.9	7.4	8.2	9.0	10.6	12.3	13.2	14.8	18.9	23.8		2.3	3.4	3.0	3.3	2.8	2.8	3.0
1976	5.9	6.2	6.3	6.6	7.3	7.8	8.6	9.5	11.0	12.6	13.3	14.6	17.2	18.8	13.8		4.6	3.3	3.6	3.0	2.9	3.1
1977	6.2	6.5	6.7	7.0	7.6	8.2	9.0	9.8	11.2	12.6	13.3	14.3	16.2	16.9	13.4	13.1		2.1	3.1	2.4	2.5	2.8
1978	6.3	6.7	6.8	7.1	7.8	8.3	9.1	9.8	11.1	12.4	12.9	13.6	15.0	15.3	12.4	11.7	10.4		4.2	2.6	2.6	3.0
1979	6.6	7.0	7.1	7.5	8.1	8.6	9.4	10.2	11.4	12.5	13.0	13.7	14.8	15.0	12.8	12.5	12.2	14.0		1.0	1.8	2.6
1980	7.0	7.4	7.6	7.9	8.6	9.1	9.9	10.7	11.9	13.0	13.5	14.2	15.2	15.4	13.8	13.8	14.0	15.8	17.6		2.7	3.4
1981	7.2	7.5	7.7	8.1	8.7	9.2	10.0	10.7	11.8	12.9	13.3	13.8	14.7	14.8	13.3	13.2	13.3	14.2	14.4	11.1		4.1
1982	7.2	7.5	7.7	8.0	8.6	9.2	9.9	10.5	11.5	12.4	12.7	13.2	13.9	13.9	12.5	12.3	12.1	12.5	12.1	9.3	7.5	
YEAR	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982

INITIAL YEAR FOR INFLATION

TABLE 9

GROWTH RATE MATRICES

UNITED STATES
GROWTH RATES FOR DEBT AND MONETARY BASE

INITIAL YEAR FOR MONETARY BASE

FINAL YEAR FOR DEBT	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952	INITIAL YEAR FOR MONETARY BASE
1952		6.0	4.8	5.2	5.5	6.6	7.0	6.8	6.8	6.7	6.8	6.5	6.7	6.5	6.5	6.4	6.2	5.9	5.3	4.9	4.6	4.3	1982
1954	1.6		3.6	4.7	5.3	6.7	7.2	6.9	6.9	6.7	6.9	6.5	6.8	6.6	6.5	6.4	6.2	5.8	5.3	4.9	4.6	4.2	1981
1956	0.9	0.3		5.8	6.1	7.7	8.1	7.6	7.4	7.2	7.3	6.9	7.1	6.8	6.7	6.6	6.3	6.0	5.4	4.9	4.6	4.2	1980
1958	1.1	0.9	1.5		6.4	8.7	8.9	8.1	7.7	7.4	7.5	7.0	7.2	6.9	6.8	6.6	6.3	6.0	5.3	4.9	4.6	4.2	1979
1960	1.1	0.9	1.3	1.1		10.9	10.2	8.6	8.1	7.6	7.6	7.1	7.3	6.9	6.8	6.6	6.3	5.9	5.3	4.8	4.5	4.1	1978
1962	1.4	1.3	1.7	1.8	2.5		9.5	7.5	7.1	6.8	7.0	6.4	6.8	6.5	6.4	6.3	6.0	5.7	5.0	4.5	4.2	3.8	1977
1964	1.5	1.4	1.7	1.8	2.1	1.8		5.4	5.9	5.9	6.4	5.8	6.4	6.1	6.1	6.1	5.8	5.4	4.7	4.3	4.0	3.6	1976
1966	1.4	1.3	1.5	1.5	1.7	1.3	0.8		6.4	6.1	6.7	5.9	6.5	6.2	6.2	6.1	5.8	5.4	4.7	4.2	3.9	3.5	1975
1968	1.6	1.6	1.9	2.0	2.2	2.1	2.2	3.7		5.8	6.8	5.8	6.6	6.2	6.2	6.1	5.8	5.3	4.6	4.1	3.8	3.4	1974
1970	1.7	1.7	1.9	2.0	2.1	2.1	2.2	2.9	2.0		7.7	5.7	6.8	6.3	6.2	6.1	5.8	5.3	4.5	4.0	3.7	3.2	1973
1971	2.1	2.1	2.3	2.5	2.7	2.8	3.1	4.0	4.2	8.6		3.8	6.4	5.9	6.0	5.9	5.6	5.1	4.3	3.7	3.5	3.0	1972
1972	2.2	2.2	2.5	2.6	2.9	2.9	3.2	4.1	4.3	6.5	4.4		8.9	6.6	6.4	6.2	5.8	5.2	4.3	3.7	3.4	3.0	1971
1973	2.2	2.2	2.5	2.6	2.8	2.9	3.1	3.8	3.9	5.1	3.4	2.3		5.5	5.8	5.8	5.4	4.8	3.9	3.4	3.1	2.6	1970
1974	2.2	2.3	2.5	2.7	2.9	2.9	3.2	3.8	3.8	4.7	3.4	2.9	3.5		6.1	5.9	5.4	4.7	3.6	3.0	2.8	2.3	1968
1975	3.1	3.2	3.5	3.8	4.1	4.4	4.9	5.8	6.4	8.1	8.0	9.2	12.7	21.8		5.7	5.0	4.2	3.0	2.4	2.2	1.8	1966
1976	3.6	3.7	4.1	4.4	4.8	5.1	5.7	6.7	7.4	9.2	9.4	10.6	13.3	18.3	14.7		4.3	3.5	2.1	1.5	1.5	1.1	1964
1977	3.9	4.1	4.4	4.7	5.2	5.5	6.1	7.0	7.8	9 4	9.6	10.6	12.7	15.7	12.7	10.7		2.7	1.0	0.6	0.8	0.5	1962
1978	4.1	4.3	4.6	4.9	5.4	5.7	6.3	7.2	7.9	9.4	9.5	10.4	12.0	14.1	11.5	10.0	9.2		-0.7	-0.4	0.2	-0.1	1960
1979	4.1	4.3	4.7	5.0	5.4	5.8	6.3	7.1	7.8	9.1	9.1	9.8	11.0	12.5	10.2	8.7	7.7	6.2		-0.1	0.6	0.1	1958
1980	4.4	4.6	5.0	5.3	5.7	6.1	6.6	7.5	8.1	9.3	9.4	10.0	11.1	12.4	10.5	9.4	9.0	8.8	11.4		1.4	0.2	1956
1981	4.6	4.9	5.2	5.6	6.0	6.3	6.9	7.7	8.3	9.5	9.6	10.1	11.1	12.2	10.6	9.8	9 5	9.6	11.3	11.2		-1.0	1954
1982	5.1	5.3	5.7	6.1	6.5	6.9	7.5	8.3	9.0	10.2	10.3	10.9	11.9	12.9	11.6	11.1	11.2	11.7	13.5	14.6	18.0		1952
FINAL YEAR FOR DEBT	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	INITIAL YEAR FOR MONETARY BASE

INITIAL YEAR FOR DEBT

UNITED STATES
GROWTH RATES FOR INFLATION AND REAL GNP

INITIAL YEAR FOR REAL GNP

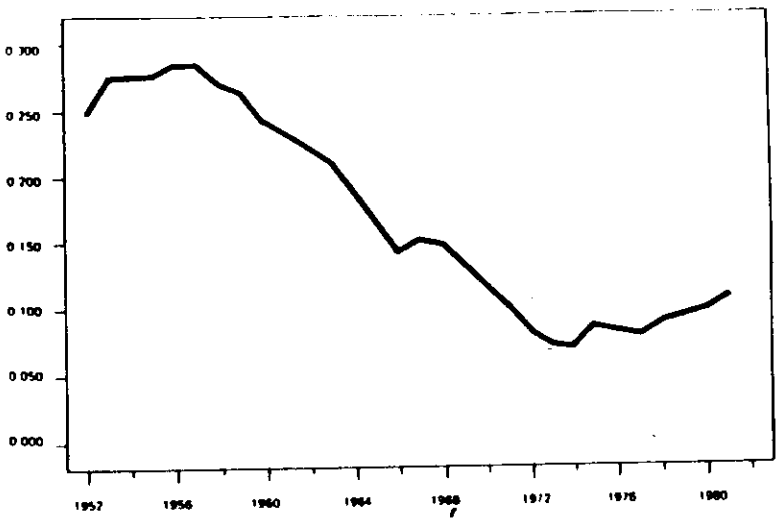
FINAL YEAR FOR INFLATION	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1968	1966	1964	1962	1960	1958	1956	1954	1952	INITIAL YEAR FOR REAL GNP
1952		-1.9	0.4	0.1	0.8	1.6	2.2	2.7	2.2	1.9	2.3	2.5	2.6	2.4	2.6	2.9	3.1	3.2	3.3	3.1	3.1	3.0	1982
1954	1.4		2.6	1.1	1.7	2.5	3.1	3.4	2.8	2.4	2.7	3.0	3.0	2.8	2.9	3.2	3.4	3.4	3.5	3.3	3.3	3.2	1981
1956	2.0	2.7		-0.3	1.2	2.5	3.2	3.6	2.8	2.3	2.7	3.0	3.1	2.8	2.9	3.3	3.4	3.5	3.5	3.3	3.4	3.2	1980
1958	2.2	2.6	2.5		2.8	3.9	4.4	4.6	3.4	2.8	3.2	3.5	3.4	3.0	3.1	3.5	3.6	3.7	3.7	3.4	3.5	3.3	1979
1960	2.1	2.4	2.3	2.0		4.9	5.1	5.2	3.6	2.7	3.2	3.5	3.5	3.1	3.2	3.5	3.7	3.7	3.7	3.5	3.5	3.4	1978
1962	2.0	2.1	2.0	1.7	1.4		5.4	5.3	3.1	2.2	2.9	3.3	3.3	2.9	3.0	3.4	3.6	3.6	3.7	3.4	3.5	3.3	1977
1964	1.9	2.0	1.8	1.6	1.4	1.5		5.3	2.0	1.1	2.3	2.9	3.0	2.6	2.8	3.3	3.5	3.5	3.6	3.3	3.4	3.2	1976
1966	2.0	2.1	2.0	1.9	1.8	2.1	2.7		-1.2	-0.9	1.3	2.3	2.5	2.2	2.5	3.1	3.3	3.4	3.5	3.2	3.3	3.1	1975
1968	2.2	2.3	2.3	2.2	2.3	2.6	3.2	3.6		-0.6	2.5	3.5	3.5	2.7	2.9	3.5	3.7	3.8	3.8	3.4	3.5	3.3	1974
1970	2.5	2.7	2.7	2.7	2.9	3.2	3.8	4.4	5.1		5.6	5.6	4.8	3.4	3.5	4.0	4.1	4.1	4.1	3.7	3.7	3.5	1973
1971	2.7	2.8	2.8	2.9	3.0	3.4	4.0	4.5	5.0	4.9		5.5	4.4	2.9	3.1	3.8	3.9	4.0	4.0	3.6	3.6	3.4	1972
1972	2.7	2.9	2.9	3.0	3.1	3.5	4.0	4.4	4.8	4.5	4.1		3.3	2.0	2.6	3.5	3.8	3.8	3.8	3.4	3.5	3.3	1971
1973	2.9	3.0	3.1	3.1	3.3	3.7	4.2	4.6	5.0	4.8	4.8	5.6		1.3	2.4	3.6	3.8	3.9	3.9	3.4	3.5	3.3	1970
1974	3.1	3.3	3.4	3.5	3.7	4.1	4.6	5.1	5.5	5.7	6.0	7.0	8.5		3.6	4.7	4.7	4.5	4.4	3.8	3.9	3.5	1968
1975	3.4	3.6	3.7	3.8	4.0	4.4	5.0	5.5	6.0	6.4	6.8	7.6	8.7	8.9		5.8	5.2	4.8	4.6	3.8	3.9	3.5	1966
1976	3.4	3.6	3.7	3.9	4.1	4.5	5.0	5.4	5.9	6.2	6.4	7.0	7.5	7.0	5.1		4.5	4.3	4.2	3.3	3.5	3.1	1964
1977	3.5	3.7	3.8	4.0	4.2	4.6	5.0	5.5	5.9	6.1	6.3	6.7	7.0	6.5	5.4	5.7		4.1	4.0	2.9	3.3	2.9	1962
1978	3.7	3.9	4.0	4.1	4.4	4.7	5.2	5.6	6.0	6.2	6.4	6.8	7.0	6.7	6.0	6.4	7.1		4.0	2.3	3.0	2.6	1960
1979	3.8	4.0	4.2	4.3	4.6	4.9	5.4	5.8	6.2	6.5	6.6	7.0	7.3	7.0	6.5	7.0	7.7	8.3		0.7	2.5	2.1	1958
1980	4.0	4.2	4.4	4.5	4.8	5.2	5.6	6.0	6.4	6.7	6.9	7.2	7.5	7.3	7.0	7.5	8.1	8.5	8.8		4.3	2.8	1956
1981	4.2	4.4	4.5	4.7	5.0	5.4	5.8	6.2	6.6	6.9	7.1	7.4	7.7	7.5	7.3	7.8	8.3	8.7	8.9	9.0		1.3	1954
1982	4.2	4.4	4.6	4.8	5.0	5.4	5.8	6.2	6.6	6.8	7.0	7.3	7.5	7.3	7.1	7.4	7.8	8.0	7.9	7.4	5.8		1952
FINAL YEAR FOR INFLATION	1952	1954	1956	1958	1960	1962	1964	1966	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	INITIAL YEAR FOR REAL GNP

INITIAL YEAR FOR INFLATION

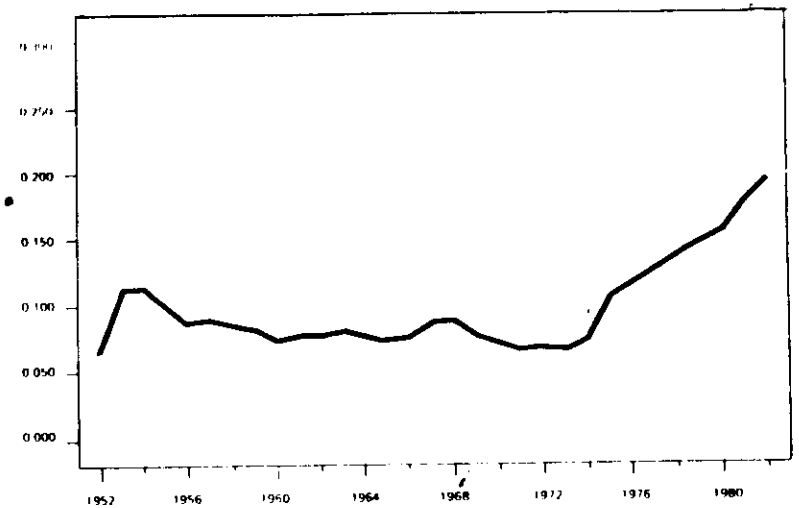
FIGURE 1

DEBT TO GNP RATIO FOR SEVEN COUNTRIES

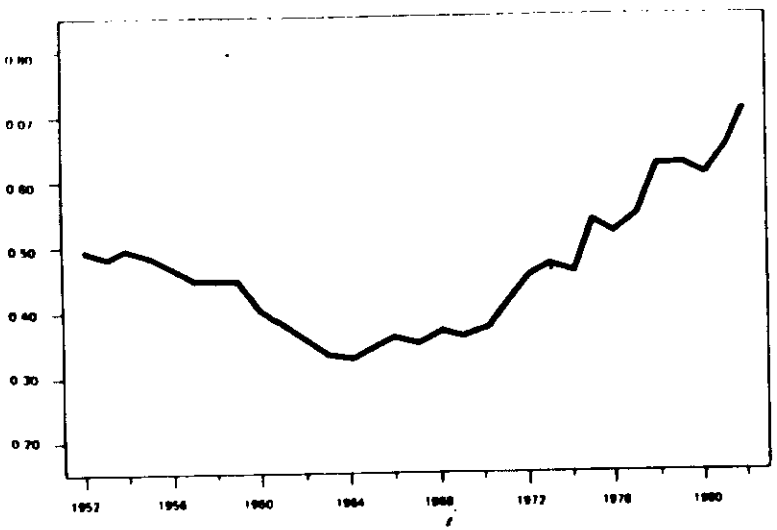
FRANCE



GERMANY



ITALY



JAPAN

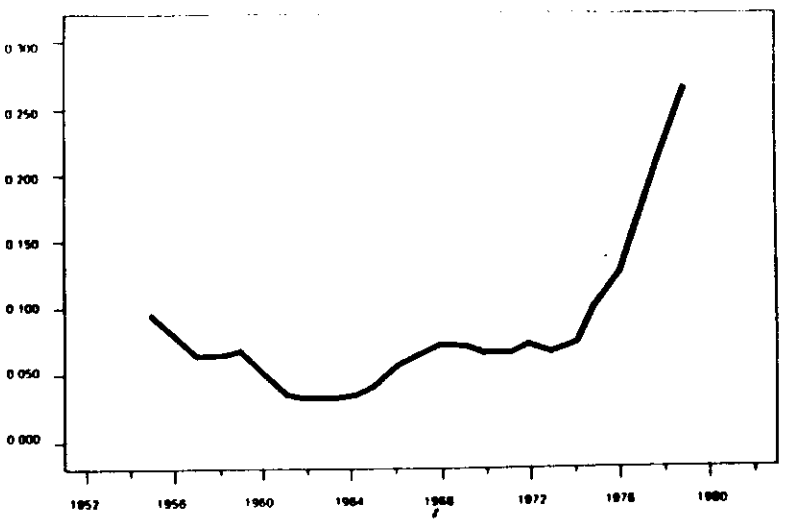
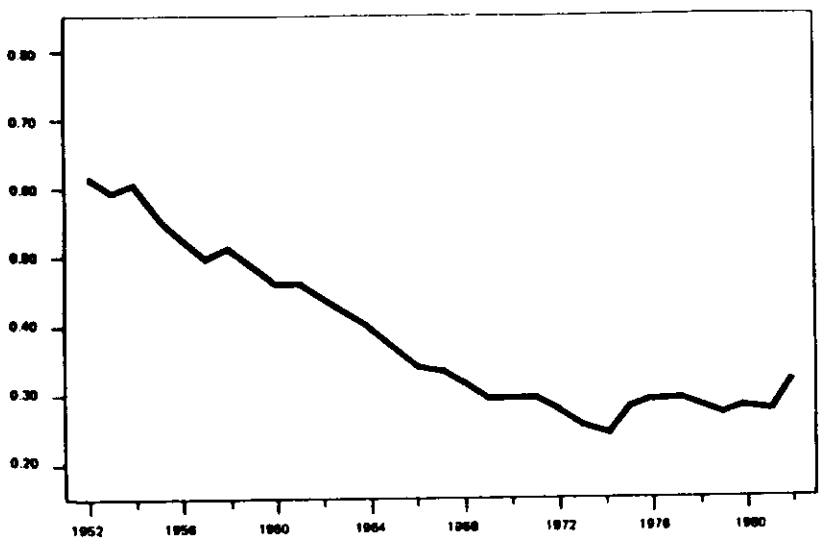


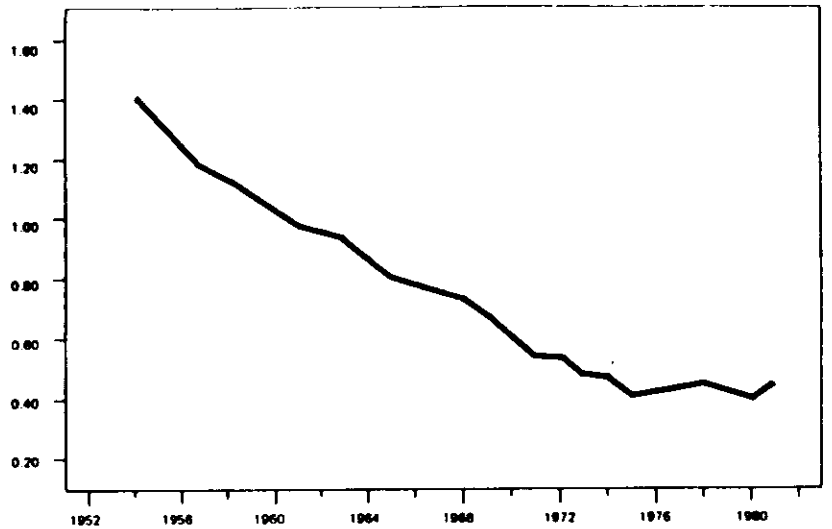
FIGURE 1

(CONTINUED)

UNITED STATES



UNITED KINGDOM



SWITZERLAND

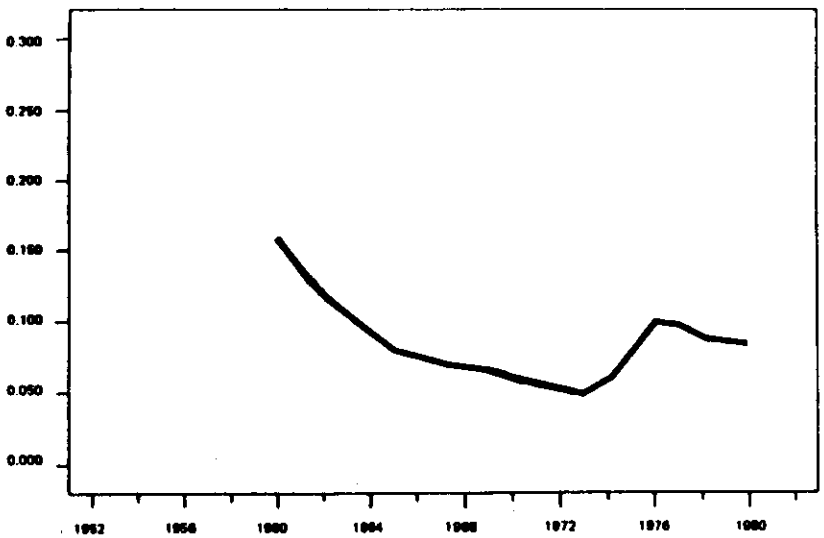
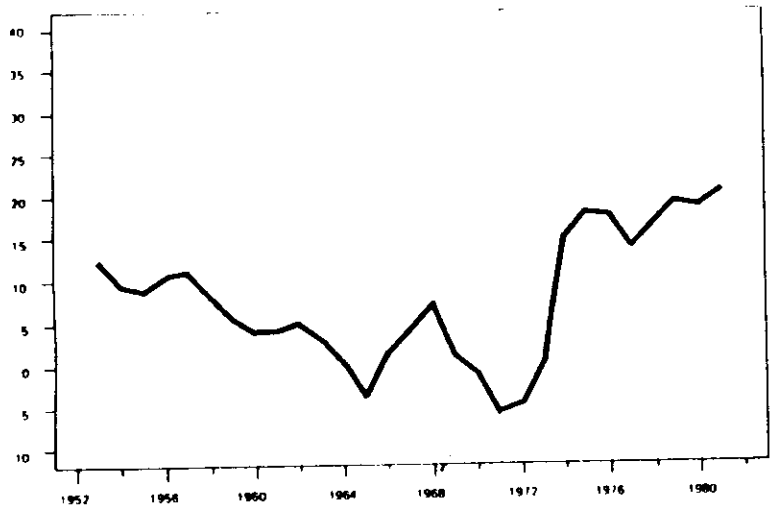


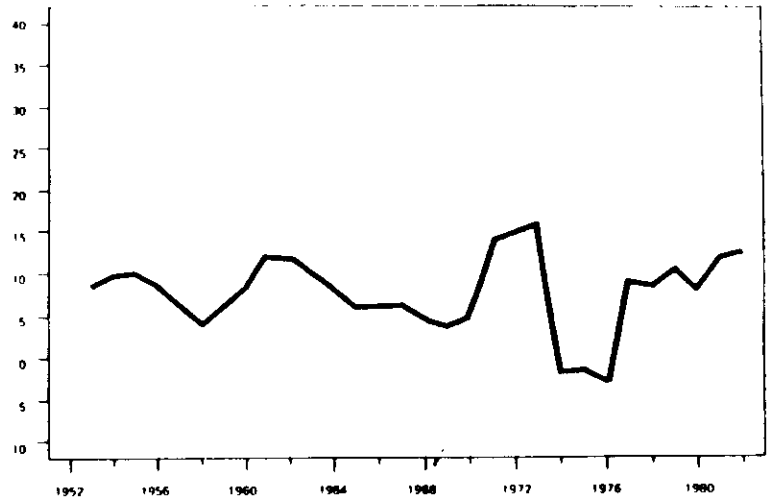
FIGURE 2

FRANCE

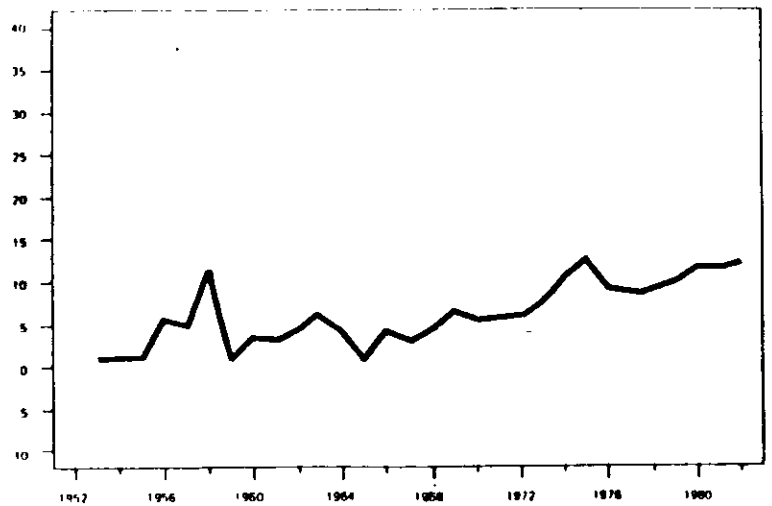
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GDP DEFLATOR



PERCENT CHANGE IN REAL GDP

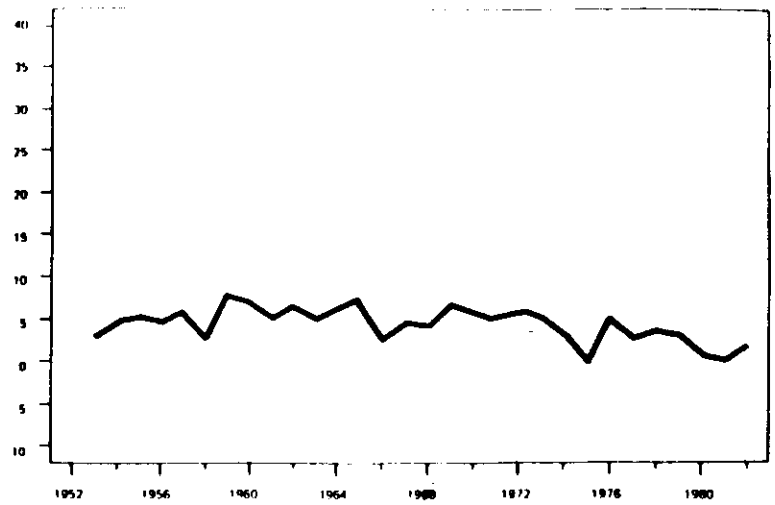
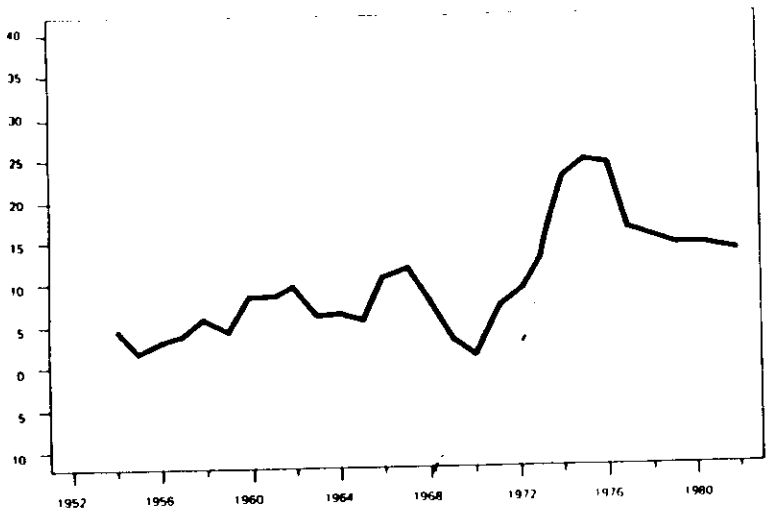


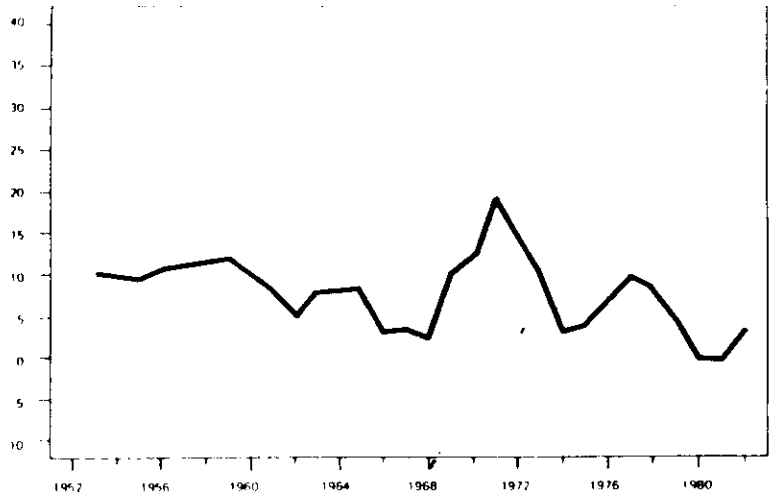
FIGURE 3

GERMANY

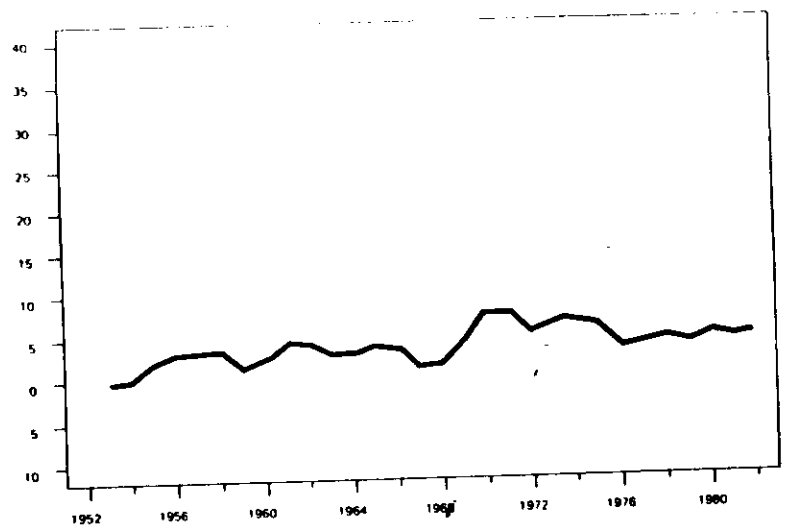
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GNP DEFLATOR



PERCENT CHANGE IN REAL GNP

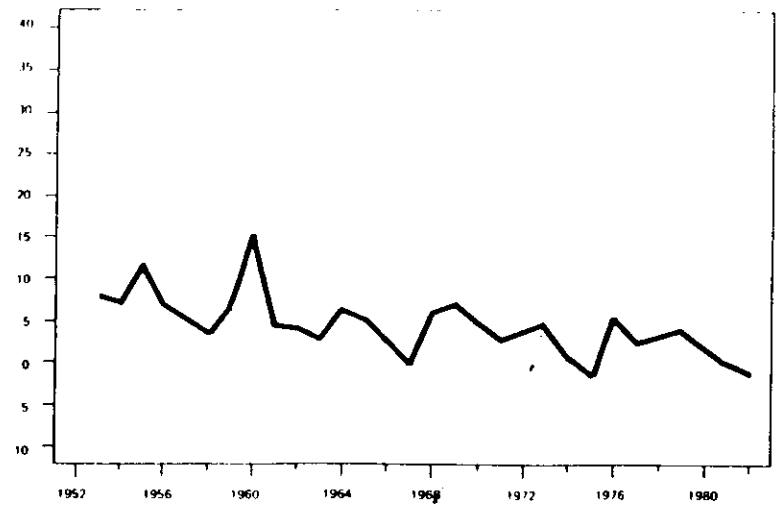
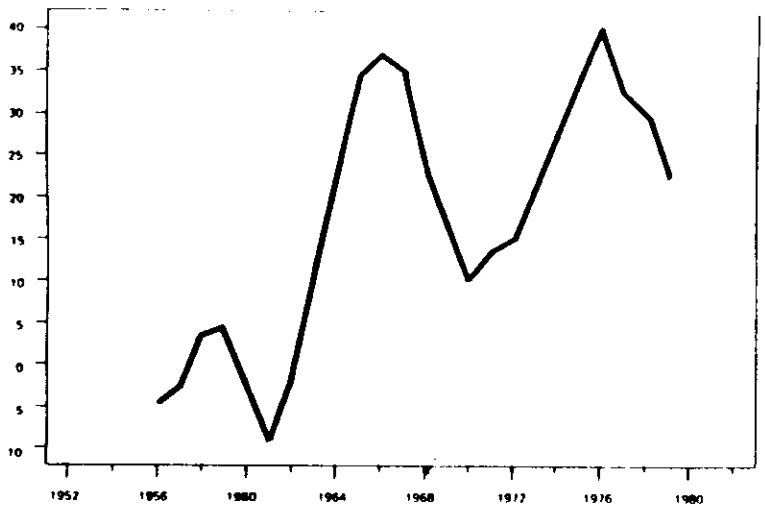


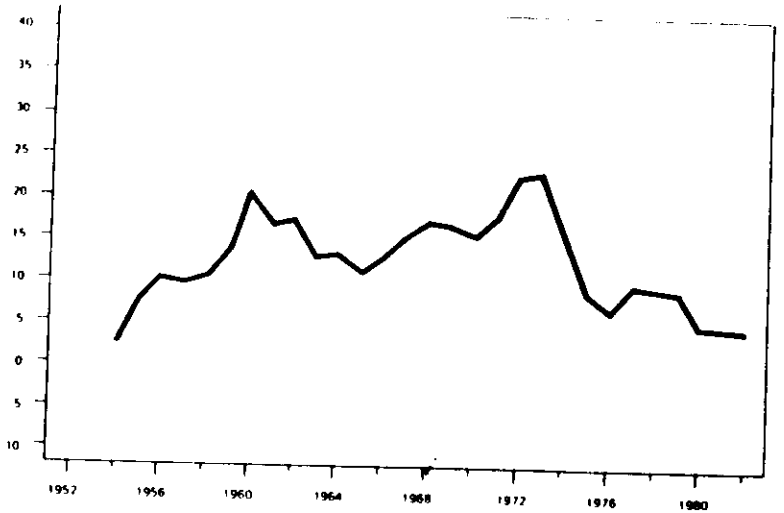
FIGURE 4

JAPAN

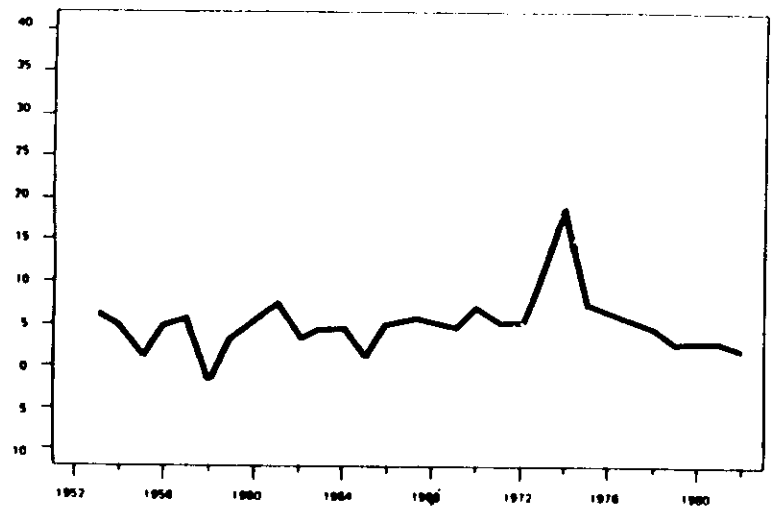
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GNP DEFLATOR



PERCENT CHANGE IN REAL GNP

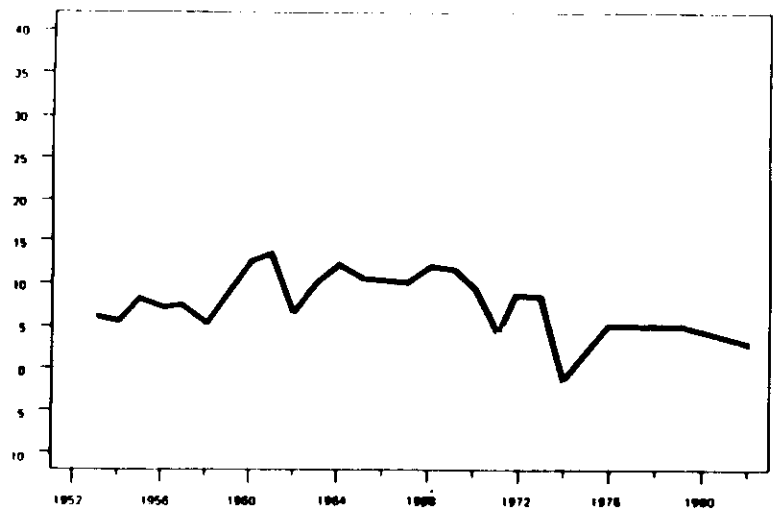
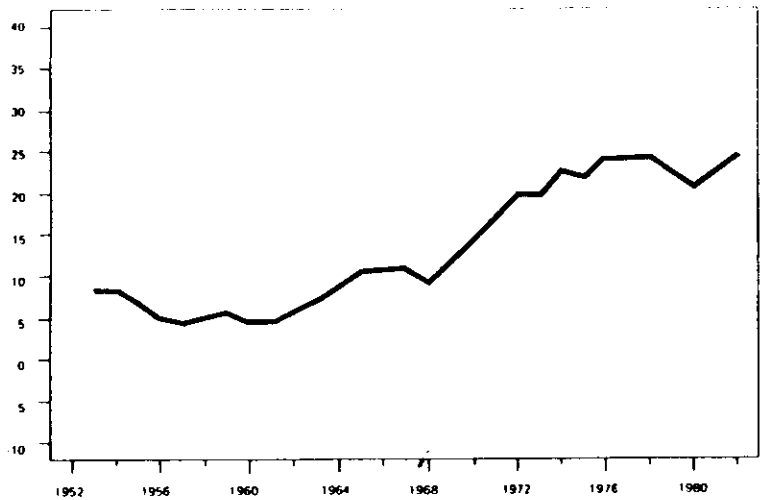


FIGURE 5

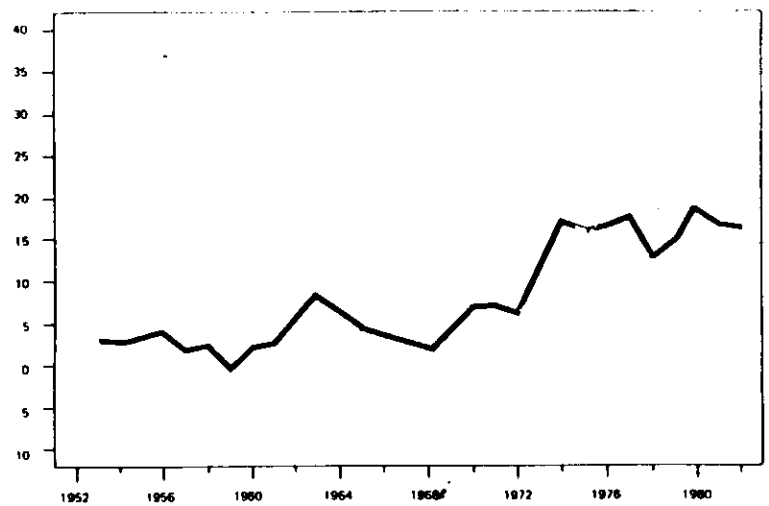
ITALY

PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE

PERCENT CHANGE IN GDP DEFLATOR



PERCENT CHANGE IN REAL GDP

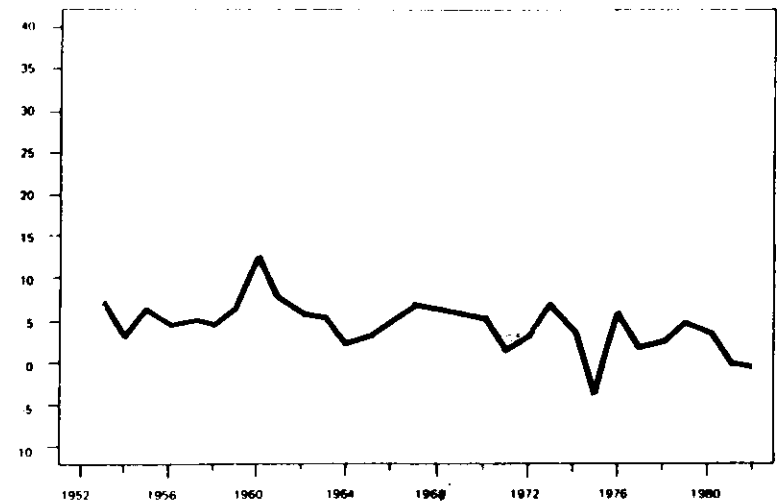
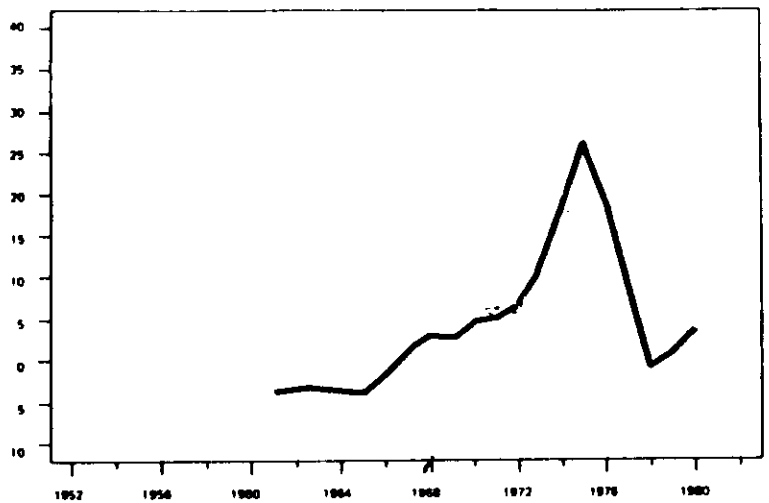


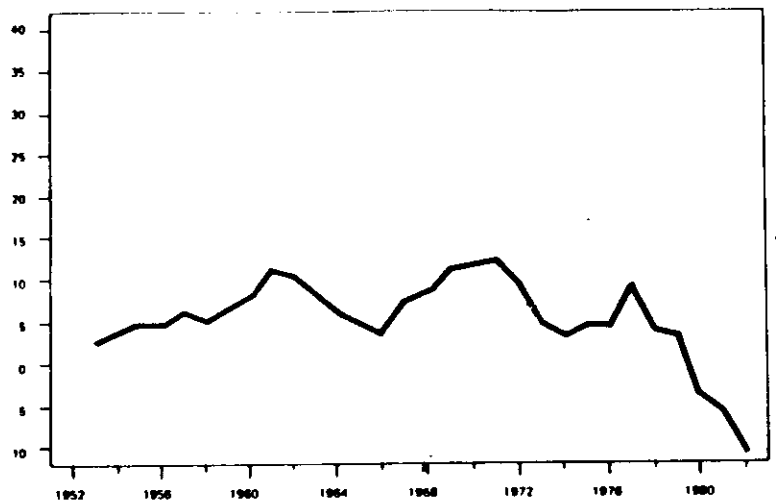
FIGURE 5

SWITZERLAND

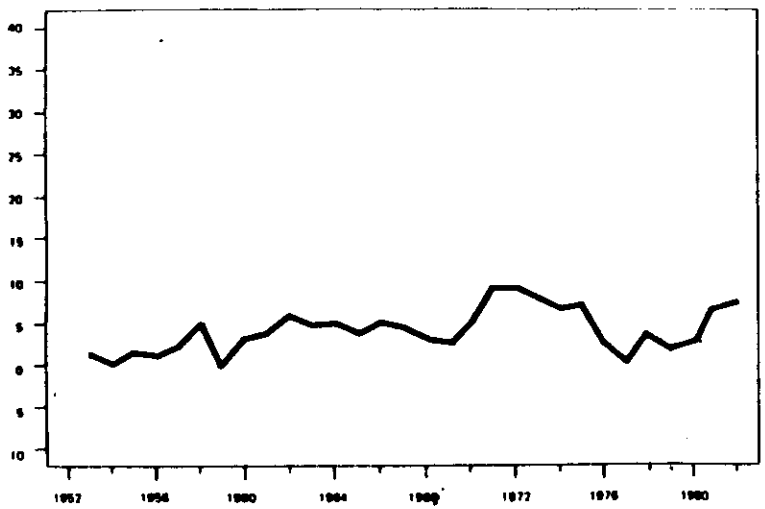
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GDP DEFLATOR



PERCENT CHANGE IN REAL GDP

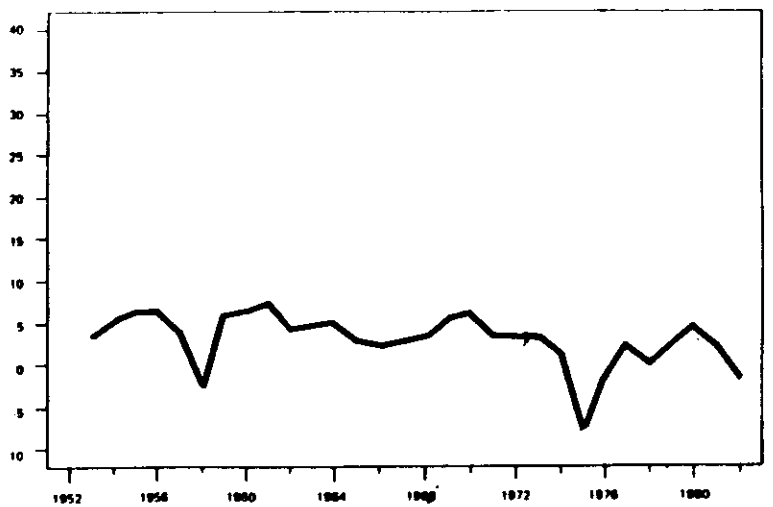
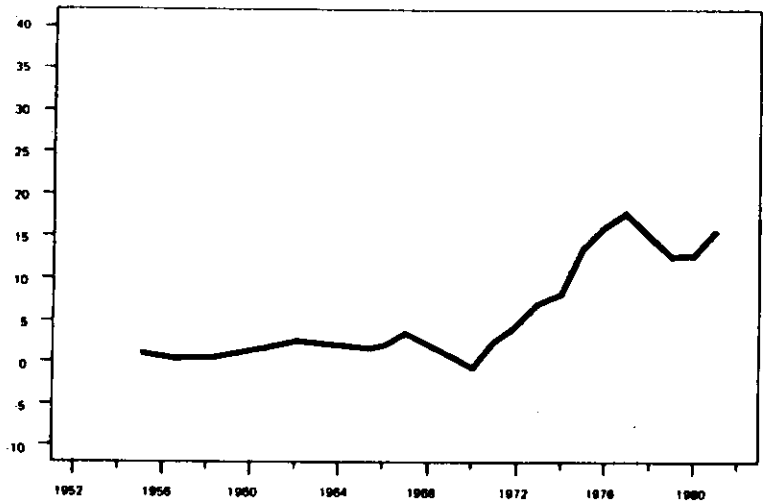


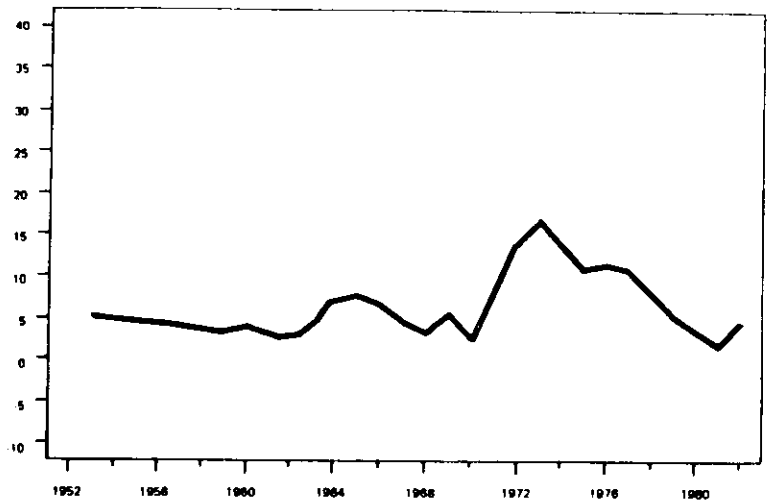
FIGURE 7

UNITED KINGDOM

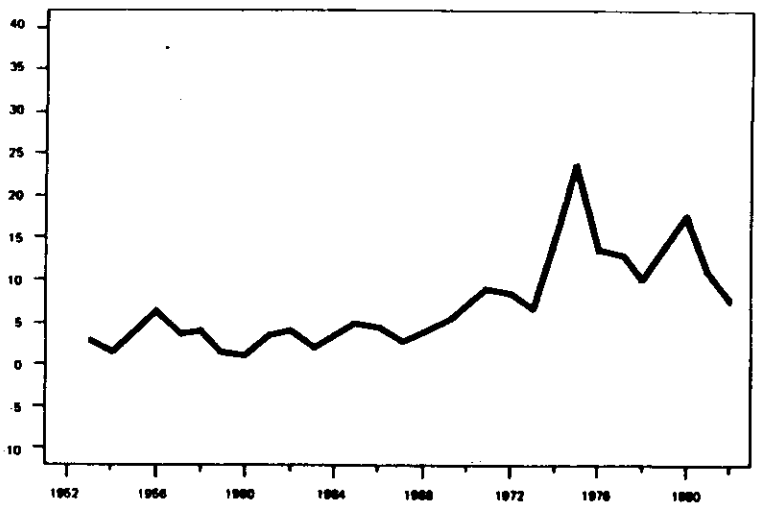
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GDP DEFLATOR



PERCENT CHANGE IN REAL GDP

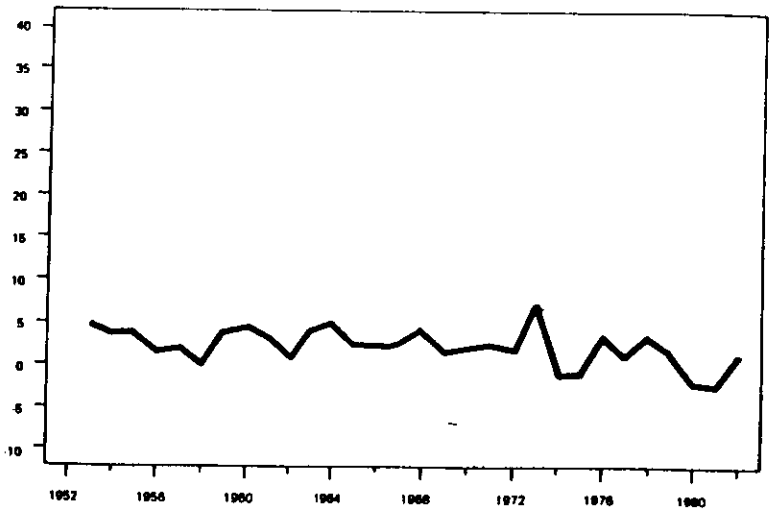
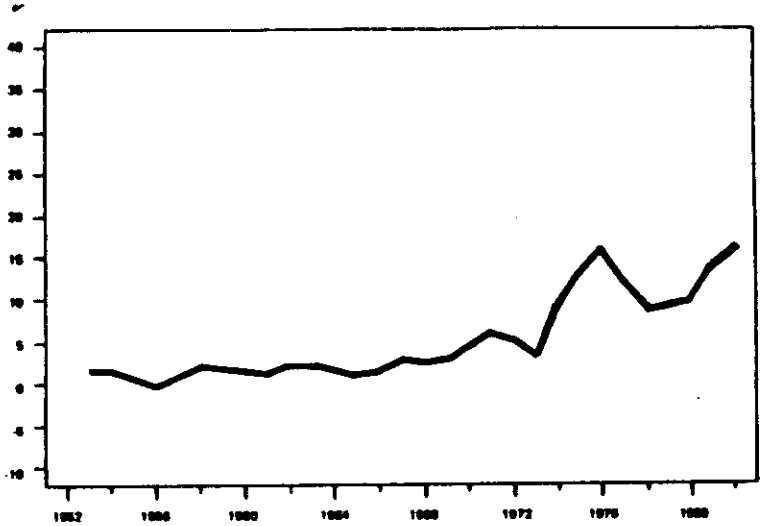


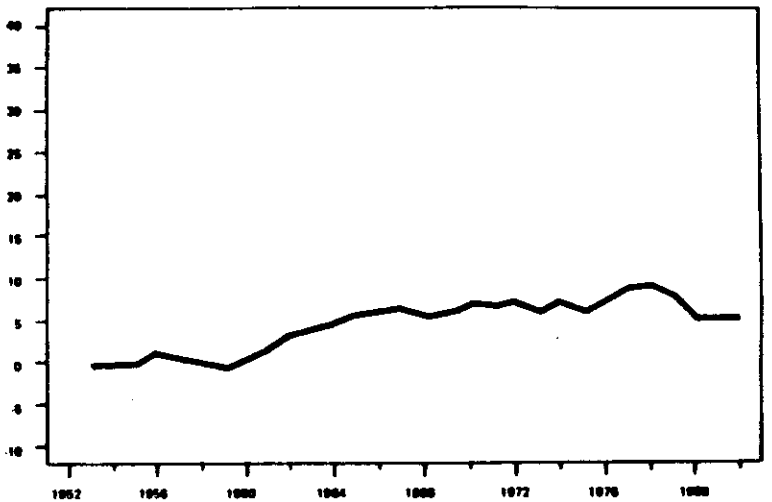
FIGURE 8

UNITED STATES

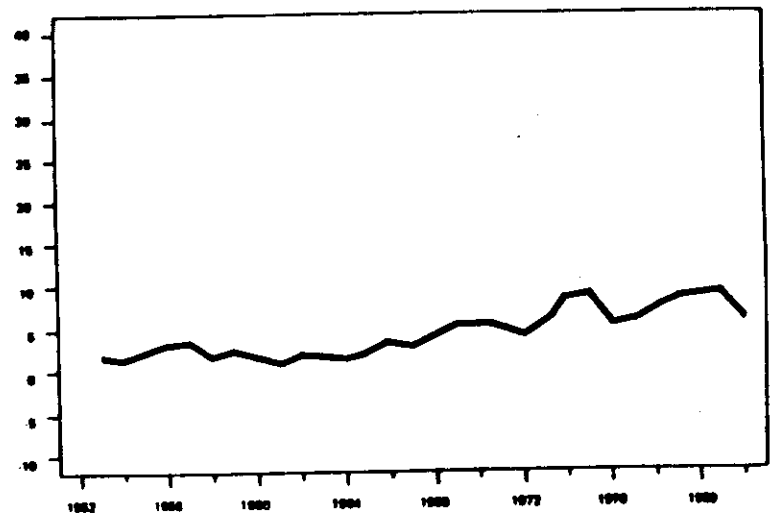
PERCENT CHANGE IN GOVERNMENT DEBT



PERCENT CHANGE IN MONETARY BASE



PERCENT CHANGE IN GNP DEFLATOR



PERCENT CHANGE IN REAL GNP