The Financial Crisis of 1931 and the Impact of the Great Depression on the British Economy

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I.   Introduction

There is currently a revival of interest in the economic history of the interwar period, particularly in the Great Depression of the 1930s. When the economy is experiencing severe difficulties, there is a tendency for economists to re-evaluate previous episodes in an attempt to understand the working of the economy and to see if the policies undertaken in the past suggest potential solutions to the current situation. The last upsurge of interest occurred during the early 1980s, when unemployment emerged as a major problem facing most advanced economies. It is not surprising that the recent financial crisis and the resulting recession have aroused renewed interest in the 1930s.

In this paper we examine the impact of the financial crisis of 1931, culminating in the suspension of the gold standard in September 1931. By doing so, we add to the existing literature by investigating the events leading up to the financial crisis and how the authorities undertook policies to avert a fully blown banking crisis. Secondly, we present some simulations using an econometric model designed to explore both the effects of the Great Depression on the British economy and the forces making for recovery in the later 1930s. The first part of the paper contains a review of the historical evidence on the course of the crisis, followed an attempt to match this account with the more recent literature on currency crises. In the second part of the paper the simulations are carried out using a previously published model, which has been updated in some respects.

II.   The Financial Crisis of 1931 and Suspension of the Gold Standard

Our starting point is a review of the British balance of payments in the 1920s as a background to the 1931 crisis. First we consider the issue of the overvaluation of sterling implicit in the decision to return to gold at the pre-war parity of $4.86 to £1. Keynes claimed in '*The Economics of Mr Churchill*' (1931) that sterling was overvalued by about 10% when the gold standard was reinstated in April 1925 at the old parity. Keynes's choice of index numbers in his purchasing power parity calculations was later criticized. Subsequent writers, using improved data, have generally supported Keynes's view that sterling was overvalued by 10-14 % when Britain returned to the gold standard in 1925. A discordant note has been sounded by Matthews (1986), who has questioned whether sterling could have been overvalued since the economy in the mid 1920s was close to the natural rate of unemployment. According to

this view the level of benefits was the major factor contributing to the higher unemployment rate rather than the overvaluation of sterling.

It is sufficient to note that by 1931 sterling was widely believed to be at an uncompetitive level and there was little evidence of an improvement in the UK's competitiveness relative to the US over the period 1925-1931, as shown by a comparison of British and American prices in Eichengreen and Jeanne (2000) Fig 1.2. The most authoritative examination of this issue was in the Report of the Macmillan Committee (1931), which concluded that sterling was overvalued and considered a number of remedies for this problem. These included the raising of international prices or reductions in money wages, Sayers (1976) p390. The first Minority Report, signed by both Bevin and Keynes, Report p199, favoured a tariff on imports, which would be used to subsidise exports. This was in effect a form of devaluation through the backdoor, while retaining the existing exchange rate. Devaluation itself was ruled out by the Majority Report, which favoured promoting a rise in world prices, but did not suggest how this might be achieved.

The lack of competitiveness of sterling under the restored gold standard contributed to the high level of unemployment in the UK during 1925-31 through forcing the Bank of England to adopt a relatively restrictive monetary policy as indicated by an average short-term interest rate of about 5%. In view of the downward trend in prices this implied a real rate of interest of about 8%. Nevertheless the UK balance of Payments showed a relatively comfortable current account surplus, which was however considerably lower in real terms than the current account surpluses achieved before 1914. There was a problem in that overseas long-term lending tended to exceed the surplus on the current account, implying that the basic balance (current account surplus less long-term capital outflow) was negative , which led Keynes to propose measures to make overseas investment less attractive. This meant that the UK's short-term liabilities were rising as the excess of long-term lending over the current account surplus was financed by short-term borrowing. The Macmillan Committee in the appendix of its Report showed that sterling short-term liabilities exceeded short-term assets. As Sayers (1976) pointed out Britain was suffering from external illiquidity, which could make it vulnerable in a financial crisis. This was reinforced by the weakening of the balance of payments in 1931. The trade in services normally showed a surplus, which was sufficient to offset the deficit on visible trade. As the world economy fell into depression in 1931, international trade contracted, which had a damaging effect on the trade in invisibles, and as a result the current account of the balance of payments went into deficit during 1931, Sayers

(1976) Appendixes. It is reasonable to conclude that the fundamentals of the British balance of payments showed major signs of weakness, making the UK vulnerable in the event of an international financial crisis.

The European financial crisis began with the failure of the Austrian Credit Anstalt in August 1931 and failures among German banks occurred as the financial contagion spread on the Continent. Both Germany and Austria imposed exchange controls, which restricted the freedom of short-term capital movements. This meant that British banks, which had short-term claims on Austrian and German banks, found that their assets were frozen. The institutions which were most seriously affected were the acceptance houses and in particular those which had a large business in accepting Austrian and German bills. The acceptance houses faced the prospect that the bills, which they had discounted, would not be paid off at maturity. The houses were major providers of international bills to the discount market and many of these were later purchased by the clearing banks. There was, therefore, a risk of a crisis at the heart of the British financial system. The incipient crisis was similar to the previous crisis affecting the London money market at the outbreak of war in August 1914. In that crisis the acceptance houses were faced with the prospect of failure because the bills, which they had discounted, could not be paid off at maturity as their debtors were unable to make payments because of the interruption of normal payments due to the outbreak of hostilities. At that time, thanks to a joint effort on the part of the Treasury and the Bank of England, a moratorium was introduced to protect the acceptance houses and to reduce pressures in the money market. In addition Currency Notes were introduced to check any threat of a run on the banks, Morgan (1952). As a result of these measures the crisis was averted. In August 1931 it was the introduction of foreign exchange controls, rather than the outbreak of war, which impeded the settlement of short-term debts, but the situations had marked similarities. Learning from its previous experience, the Bank announced that bills frozen as a result of failure of Continental borrowers to pay their debts would still be accepted for discount at the Bank. In this way the frozen bills continued to be acceptable in the money market. As a result the threatened crisis in the London money market was avoided. The subsequent history of the frozen bills and the details of the Standstill agreements is discussed in Sayers (1976) pp503-512 and in Balogh (1947). The potential crisis has recently been discussed by Accomulotti (2012). He considers that the narrowly averted crisis in the London money markets was a major factor weakening confidence in Sterling and so contributing to the exchange rate crisis in September 1931. The main point which we wish to

make here is that the threatened banking crisis did not occur, thanks to the response of the Bank. Hence, Britain only experienced an exchange rate crisis in 1931, which was not combined with a banking crisis as in Germany.

The main events of the crisis can be briefly summarized. The crisis began with the failure of the Austrian Credit Anstalt Bank on May 11. The crisis spread to the German banking system and resulted in failure of the important Danat Bank on July 13. The Berlin stock exchange was closed and exchange controls are introduced in Germany. On the same day the Report of the Macmillan Committee was published. This showed that the Britain had short-term liabilities which exceeded its short-term assets, thus revealing the potential vulnerability of Britain in the event of a speculative attack. In addition the short-term lending of British banks to Austria and Germany was effectively frozen as a result of the introduction of exchange controls in Central Europe, immobilizing Britain's short-term assets.

Bank rate, which had been reduced to 2.5 % in May, was raised by one point to 3.5 % on July 23, but losses to the reserves persisted. Sayers p392 records that discussions took place in the Bank about whether to allow gold losses to continue and to respond by raising Bank rate or alternatively to negotiate credits. The first policy was favoured by the traditionalists, while the international school favoured the use of credits from co-operative central banks. It was agreed to raise Bank rate further to 4.5 % on July 30 and that credits would be sought from the Federal Reserve and the Bank of France. Both parties agreed that pressure should be put on the Labour government to reduce the budget deficit. The Federal Reserve required assurance that sufficient gold would be available to repay the credits it was granting. This assurance required a rise in the Bank's fiduciary issue to release additional gold reserves. Although it helped the negotiation of credits, this relaxation did not provide any assurance to those who had doubts about the commitment of the Bank to the gold standard. The announcement of the credits from New York and Paris coincided with the publication of the Report of the May Committee on public expenditure on July 25. The Report called attention to the size of the budget deficit in an alarming way and argued for reductions in public expenditure, including a cut in the dole. The Report shocked financial markets, overshadowing the announcement of the credits, and there were renewed losses to the reserves.

On August 5 the Bank withdrew support temporarily from sterling, which fell below the gold export point and resulted in a heavy loss of gold. The Bank of France was extremely critical

of the Bank's tactics and urged strongly that credits should be used to support the exchange rate, Sayers p395-6. The advice from both Paris and New York was that that Bank rate should not be raised but both looked for reductions in the budget deficit. The Bank also emphasised the need for 'self–help' and put increasing pressure on the Labour government to take action on the budget deficit. Between 10th and 23rd August Sir Ernest Harvey, acting as Governor on account of Norman's illness, had 8 meetings with Prime Minister Ramsay MacDonald on the issue of the budget deficit in addition to meetings with leaders of the opposition parties. On August 13 there were heavy losses of gold and the first instalment of credits was almost exhausted. Further assistance was sought from New York and Paris. The Bank was informed that further credits could be extended, but there must be firm assurance over the reduction of the budget deficit. Morgans, who were the Bank's agents in New York, urged that action on the deficit was a requirement, if they were to raise funds from a syndicate of US banks, Sayers p 398.

From 22-23 August the Cabinet discussed the issue of Budget cuts urgently. No agreement could be reached in particular on the issue of reductions in the dole and Prime Minister Ramsey Macdonald resigned. A National Coalition government was formed with Macdonald as Prime Minister with Snowden continuing as Chancellor. The new administration had the support of the Conservatives and the Liberals, but not of the bulk of the Labour Party. On September 10 Snowden introduced an emergency budget which included proposals to cut the Budget deficit. This enabled the additional credits from Paris and New York to be secured, but losses of reserves persisted at an increasing rate, such that the new credits were virtually exhausted by September16. At this point the Bank decided to cease defending the exchange rate and the suspension of the gold standard was announced on September 19. Throughout the final stages of the crisis Bank rate was held unchanged at 4.5%, but it was agreed to raise it to 6% after the departure from gold was announced.

There are number of unresolved issues in this account of events leading up to suspension. The first is the failure of the fiscal measures introduced by the Coalition government to reassure the foreign exchange market. It had been expected that the coalition would include all the major political parties, but in the event Labour, which was the largest party in Parliament, did not participate. It was believed by some that Labour would win a majority at the approaching General Election and would reverse the restrictive measures introduced by the Coalition. In the event this expectation was ill- founded as the Conservatives emerged as the dominant party in the election on October 27. Eichengreen and Jeanne (2000) provide a possible

explanation in terms of a second generation model of currency crises, which makes the timing of crises unpredictable provided certain conditions are satisfied.

The second problem was the failure of the Bank to use Bank rate to defend sterling in the final stages of the crisis. This was the traditional weapon for checking gold outflows as explained forcefully by Bagehot (1873). The Bank's tactics in the 1931 crisis were strongly criticized by Sir Otto Niemeyer on these grounds. He argued that sterling could and should have been defended by appropriate use of Bank rate. Eichengreen and Jeanne (2000) suggest that the Bank did not use the traditional weapon on account of the high level of unemployment, which stood at 20% of insured employees in 1931. The Bank was well aware of this issue having been criticized in the 1920s for raising Bank rate to strengthen sterling. It had also been attacked over its reluctance to admit the connection between the Bank rate and unemployment in its evidence to the Macmillan Committee. A similar view is expressed by Janeway (1995-6), who points to the growing political element in decisions over Bank rate compared with the operation of the pre-1914 gold standard. There is however another factor which could help to explain the decisions of the Bank on Bank rate policy. The Bank was heavily dependent on support from Paris and New York throughout the crisis. Neither source of support wanted Bank rate to be raised, but they urged action over the budget deficit with which the Bank concurred. A rise in Bank rate in 1931 would not have been helpful to other central banks, which were seeking to combat rising unemployment in their own economies. In the Bank the traditional view of Bank rate was less important than complying with the terms needed to secure credits. The discussions which Sayers(1976) records relate largely to credits and budget cuts but not to movements in Bank rate, which appears to have been downgraded in an era in which central bank cooperation was the main consideration. Clarke (1967) points to the importance of joint action by central banks in the crises affecting Austria and Germany. The Bank does not appear to have been much concerned about the high level of unemployment in its discussions before the suspension of the gold standard. Its chief concern was with the budget deficit. It brought unremitting pressure on the Labour government to tighten budgetary policy, which would have increased unemployment. A rise in Bank rate was generally preceded by losses of gold. When the Bank allowed sterling to drop below the gold export point in early August, this could well have prompted a rise in Bank rate. The Bank of France intervened to urge the use of credits in the form of holdings of foreign currency to support the exchange rate rather than allowing gold reserves to be depleted. Providers of credits were concerned that gold reserves should be retained to ensure

that the borrower was able to repay the credit in due course. Central bank cooperation, through provision of credits, made traditional manipulation of Bank rate seem unnecessary. Co-operation did not achieve its objectives on account of the failure of the Bank to secure cuts in the Budget deficit.

To conclude we argue that the neglect of the traditional use of Bank rate in the sterling crisis of 1931 is to be explained by the growth of international co-operation among central banks which made compliance with the terms of credits the main consideration for borrowers. These terms did not include use of the traditional Bank rate mechanism to induce gold flows between financial centres. But they did assume the ability of the central bank to influence decisions over budgetary policy. This assumption was not satisfied.

III   The Impact of the Great Depression of the 1930s on the British Economy

In the second part of the paper we use a macroeconomic model to examine the effect of the Great Depression on the British economy. What we have to explain is how, despite a major setback to exports, Britain managed to avoid the worst effects of the world slump. Britain suffered less than other major economies such as the US and Germany despite its vulnerability to a major contraction of world trade. Middleton (2010) provides an excellent assessment of macroeconomic developments in interwar Britain and Crafts and Fearon (2010) place British experience in an international context.

The model which we use is a modified version of the model we presented in Dimsdale and Horsewood (1995). It includes an error-correction consumption of the form developed by Hendry (1983), which is widely used in macroeconomic modelling using the general-to-specific method of estimation. Investment is modelled using the approach of Bean (1981) which is an application of the Hendry methodology to investment. The supply side of the model uses the approach used by Layard, Nickell and Jackman(1991) , which is widely used in the analysis of labour markets. This approach now represents only one of a number of ways of doing empirical macroeconomics. There is, as pointed out by Pagan (2003), a trade-off in empirical macroeconomics between models which emphasize the empirical, being data-consistent, and those which emphasize consistency with economic theory. The approach used here is only one of several now available to researchers. It represents the middle ground

in the trade-off between the empirical and the theoretical approaches to modelling. The main features of the model are summarized in an Appendix.

The model is used to examine the effects of the Great Depression and factors making for recovery in a series of simulations. Before reporting these results we look at some charts which illustrate some of the features of both the data set and the relationships in the model. Chart 1 shows GDP and unemployment. It shows the decline in output in 1931-33 followed by recovery and the associated fluctuation in unemployment, which remained at a high level throughout the interwar period compared with both pre-1914 and post-1945 experience. Chart 2 shows the relative stability of consumers' expenditure in the slump compared with the wider cyclical fluctuation in fixed investment. This stability is one of the main features of the British interwar economy and needs to be explained. Chart 3 examines the relationship between the volume of UK exports and world trade in manufactures. It suggests that the collapse of international trade in the depression had a major effect on British exports. By contrast, in Chart 4 imports show much more resilience in the downturn, while there was a marked improvement in the terms of trade, due largely to the fall in import prices in the slump. Investment is plotted in the next two charts. The revival of private sector house building shown in Chart 5 was a major feature of the early stages of the recovery 1932-4. Investment in housing was sensitive to interest rates, here represented by the Treasury bill rate (TBR), which a major feature in the equation for housing investment. By contrast the revival of private investment, excluding housing, shown in Chart 6 came later in the recovery that is post 1934 and it was highly responsive to GDP. Hence, the equation for this component of demand shows investment depending upon changes in output. Chart 7 shows government expenditure on goods and services. It indicates that public spending on goods and services showed a good recovery from 1933, which became stronger after 1935 with rapidly growing expenditure on defence. Chart 8 shows the close relationship between civil employment and GDP, which is a feature of the employment equation. The relationship between the real product wage, that is the money wage divided by the price of output, and unemployment is shown in Chart 8. It may be seen that there was a rise in the real wage in the recession and real wages continued on a gradual upward course in the recovery. The impact of the real wages on employment was not found to be high in the employment equation. The behaviour of the real wage shown by Eichengreen and Jeanne (2000) is quite different from that shown here. In their Fig 1.3 the real wage rises steeply in the depression and declines as the economy recovers from 1932. This outcome may be explained by their

use of the unsatisfactory Bowley monthly index of wage rates combined with the use of a cost of living index as a deflator, when what was is needed is a measure of the price of output. The other main wage series available to us is the quarterly index of wage rates compiled by the Board of Trade, which gives a similar picture to Chart 8, Dimsdale *et al* (1989) p272.

Our model indicates that the Great Depression was transmitted to the British economy through a decline in exports. This reduced GDP and caused a set back to investment. The fall in import prices, combined with stickiness in money wages resulted in a rise in real wages. The fall in employment due to lower demand and higher real wages was not sufficient to prevent real personal income from rising in the depression. As the demand for labour was found to be relatively inelastic with respect to the real wage, higher real wages did not have a large effect on employment. The rising real wages of those in employment enabled real personal income to rise in the downturn and also consumer spending, which was highly dependent upon it.

In the recovery there was some growth of exports due to a revival in world trade and the depreciation of sterling after the suspension of the gold standard. There was a recovery in private house building and later on in private industrial investment. The first was due to the fall in interest rates after the suspension of the gold standard and the second to the recovery in growth output from 1933. Rising government spending on goods and services was a feature of the recovery in its early stages and this was reinforced by the rapid growth of expenditure on rearmament from 1935.

IV   Simulation Results

We carry out a series of simulations of the model. The first group of simulations relates to the effects of the suspension of the gold standard and the worldwide depression on the British economy. The second group looks at the forces making for recovery in the later 1930s. The output of the simulations are expressed as percentage of base-run values. These are the numbers generated by the model when the exogenous variables take their actual values.

First we look at the effect of holding the exchange rate at the 1929 level of \$4.86/£ and the Treasury bill rate at the average 1931 level of 3.6%. This implies that sterling is held at the

pre-devaluation level. The simulation compares this outcome with the base run in which sterling is devalued and the Treasury bill rate is reduced and follows its actual course.

Holding to the unchanged exchange rate would have reduced GDP by 5-6% in 1932-4 and there would have been a decline of exports by 20%. The combination of a higher interest rate and lower GDP hits investment in both private housing and private sector industry. Housing investment falls by 25% and non-housing investment by around 20%. The decline in consumer spending is rather lower. Employment falls by 3%. It is a feature of the model that the fall in employment is less than that in GDP of 5-6%. The fall in employment relative to the base run is the result of both the higher level of the exchange rate and the higher interest rate.

In simulation 2 world trade is held at the 1929 level, which implies a much higher level of activity than that experienced in the early 1930s. As a result exports are 40% higher than the depressed level of 1932-3 and GDP is 11-12% higher than in the base run. Both consumers' expenditure and employment rise by 5%. Non-housing investment benefits from the higher level of GDP, but the benefit to housing investment is rather smaller. It may be concluded that the fall in world trade in the early 1930s had a major effect on British exports, GDP and employment. This result implies that the effect of the fall in world trade, which is included in the base run, reduced consumers' expenditure by 5%. How this can be reconciled with the actual rise in consumers' expenditure? We shall return to this issue later.

Simulation 3 examines the effect of holding the Treasury bill rate at the average 1929 level. There is, therefore, no benefit from the cheap money policies of the 1930s. The higher interest rate has a negative impact on private house building, which is reduced by 30% in 1933-4 compared with the base run, but the effects on non-housing investment, consumption and GDP are considerably smaller. While private sector house building is sensitive to the interest rate, it is a relatively small component of expenditure, which may explain its limited effect on movements in GDP. Since the effects of a higher interest rate were relatively modest, it would appear that the effect of the exchange rate was more powerful than of the interest rate in simulation 1.

Before going on to examine the recovery we look at some of the implications of the simulations which have been reported so far. Simulation 2, on the effect of world trade being held at the 1929 level, is of particular interest in explaining the behaviour of consumption. We have seen that consumption would have been reduced in 1932-3 by 5% compared with

the base run. Both the base run and the simulation include the effect of falling import prices on consumption, so the difference which is reported in the table is that of the fall in world trade alone. In fact actual consumption rose by about 5% from 1929-1932. There is a difference of 10% which needs to be accounted for. During this period import prices fell by 25% and both consumer prices and the price of final output fell by 10%. In the consumption function of the model, a reduction of 10% in the consumer price index raises both real personal income and consumption by 10%. What happened in the Great Depression was that the reduction in consumption due to the decline in world trade was more than offset by the impact of the decline in import prices and consumer prices on real disposable income and consumption. This reconciles the effects of the decline in exports and employment with the consequences of falling prices on consumer spending.

The dynamic effect of falling prices on consumption is important in the consumption function of the model and also by Hendry (1983). We have carried this work further in estimating a quarterly consumption function for the UK as part of a comparison with US and German experience. We find that the consumption function for non-durables has similar price effects to the results reported for the annual consumption function estimated for the model. Our results support the views of those economic historians, such as Richardson (1967),who have pointed to the rise in consumer spending in 1931-2 in moderating the impact of the Great Depression on the UK. What we have tried to do is to explain the processes which produced this outcome as it has not been addressed by previous writers.

What also needs to be explained is why the rise in real wages associated with the fall in prices combined with sticky prices did not have a major effect in reducing employment and hence the real income of employees. As previously discussed, the employment function of our model shows that the demand for labour was relatively inelastic with respect to the real wage so that a rise in the real product wage did not have large effects on employment. The real wage bill, that is employment times the real wage, rose as a result of the fall in prices, due to the higher real wages of those who kept their jobs. The real wage bill is the predominant constituent in real personal income. Hence real personal disposable income and consumption could rise at a time of rising real wages and declining employment. This enabled rising consumption to offset the effects of the large negative shock to exports. As a result the impact of the Great Depression on the British economy was remarkably mild, compared with the experience of other leading economies, such as the US and Germany. Crafts and Fearon (2010) p287 give a comparison between Britain and the United States.

In the second group of simulations we look at factors making for economic recovery. Simulation 4 holds the level of world trade at its low point of 1932. This has a discouraging effect on exports which are reduced by more than 25% in 1937 compared with the base run. Non-housing investment falls by 20% as it is highly responsive to movements in GDP, which declines by more than 8% in the wake of the reduction in exports. Employment is reduced by 3%. The effects on private sector housing investment and on consumers' expenditure are smaller. The result of this simulation is to show that a failure of world trade to revive would have had serious consequences for the recovery of the UK in the late 1930s.

The effects of lower interest rates have already been examined in Simulation3. These are found to be strong for private sector housing, but the effect on consumption and GDP is relatively modest.

Thirdly, we examine the effects of public expenditure on recovery. First we look at the effect of expenditure on rearmament. Defence expenditure is held at the 1935 level. This suggests that GDP would have been reduced by about 2% of GDP in 1937-8. The dynamic effects of consumption may not have had time to work themselves out, so the long-run effects could be larger than allowed for in a simulation which stops in 1938. The reduced level of defence spending has a discouraging effect on non-housing investment which is 8% lower in 1937-8, but the effects on consumption are smaller. These results for defence expenditure can be compared with those found by Thomas (1983).

We find much stronger effects if public expenditure is held at the 1932 level as in simulation 6. Public spending here includes current expenditure on goods and services and public sector investment. The simulation shows public expenditure as having major effects on the economy. If expenditure had been held at the 1932 level, GDP would have been reduced by 7-8% in 1937-8 with marked effects on non-housing investment. Consumer spending would have been reduced and employment lowered.

Overall, it would appear that the limited recovery of world trade made a major contribution to the revival of the later 1930s. It also seems that government spending broadly defined was also important in the recovery. Effects are much smaller if the increases in public spending are confined to expenditure on defence from 1935. By contrast we do not find major effects

of lower interest rates on GDP. These are concentrated on private sector housing, but this is a relatively small element in national expenditure.

List of Charts

Chart 1: GDP and Unemployment
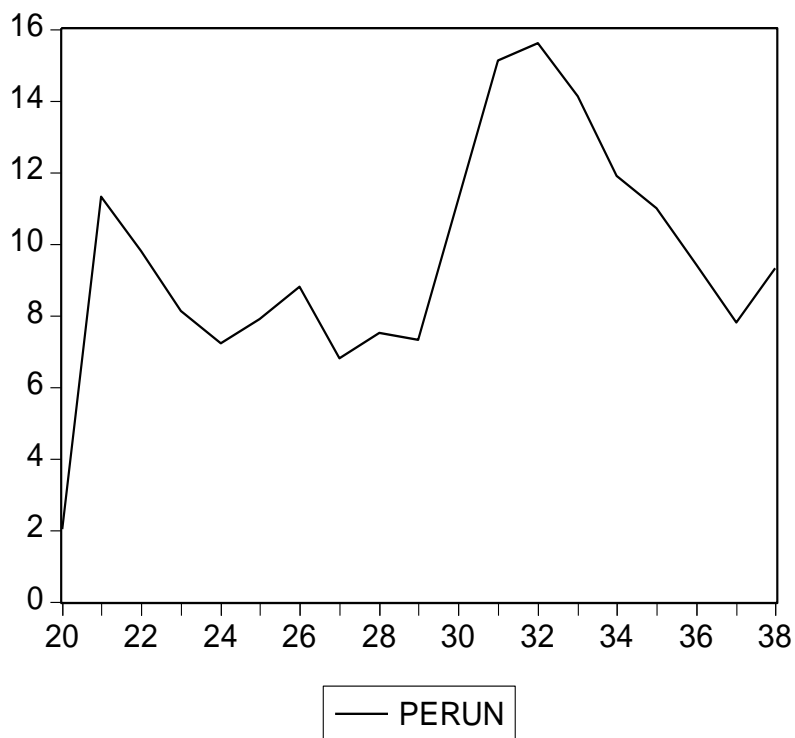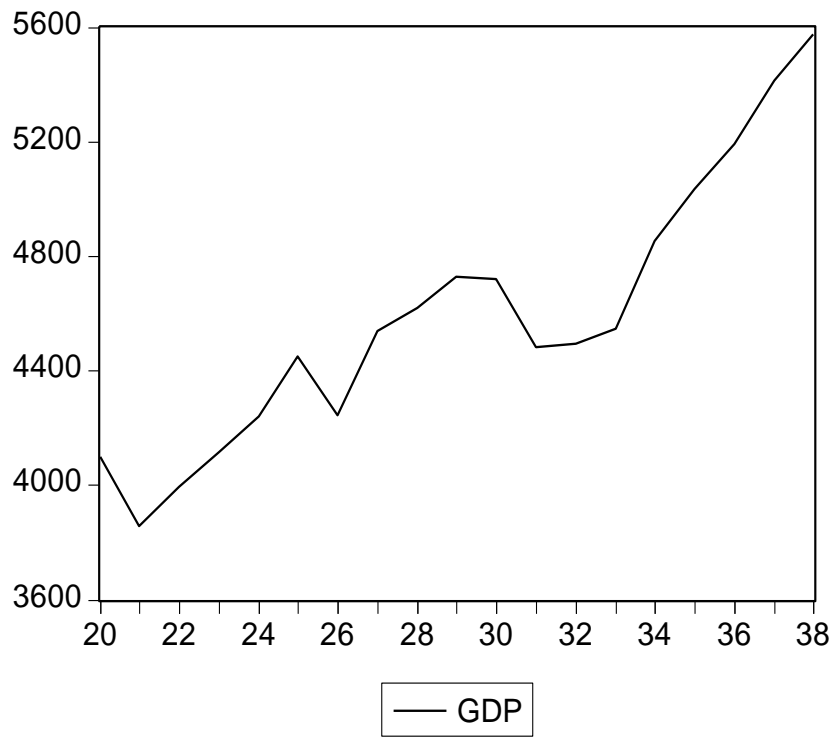
Chart 2: Consumption and Investment
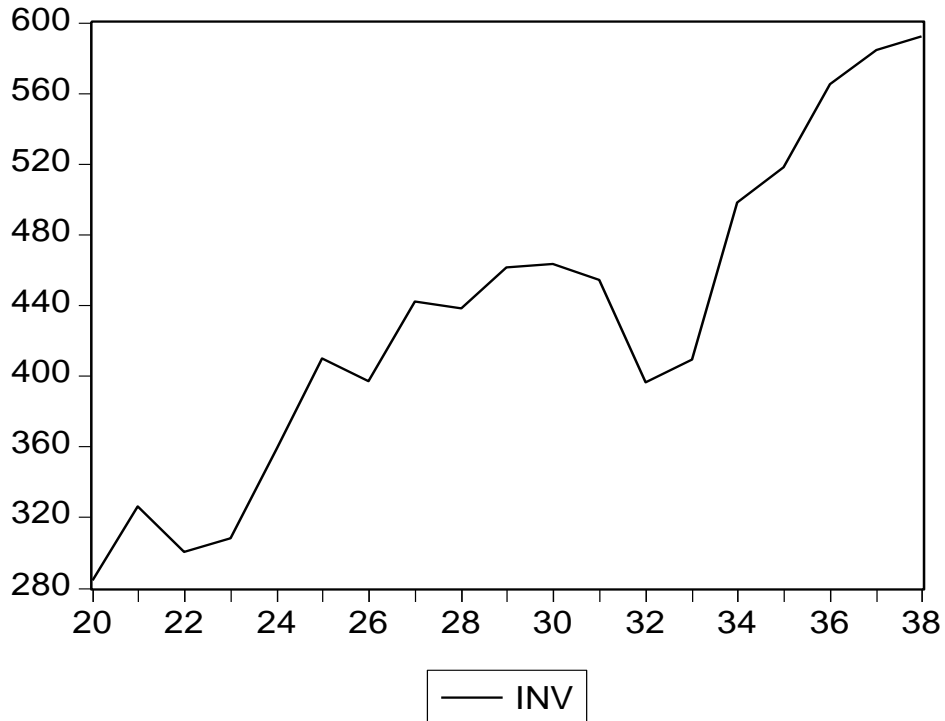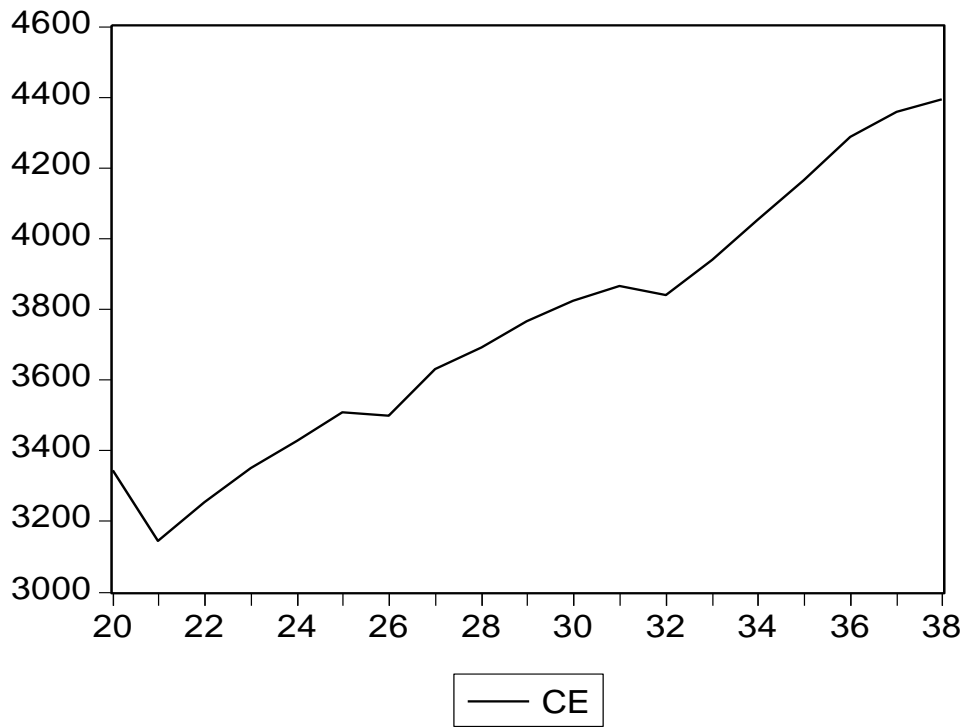
Chart 3: UK Exports and World Trade in Manufactures

Chart 4: UK Imports and the Terms of Trade

Chart 5: Investment in Private Sector Housing and Short-Term Rate of Interest (TBR)

Chart 6: Private Sector Non Housing Investment and GDP

Chart 7: Government Spending on Goods and Services and GDP

Chart 8: Civil Employment and GDP

Chart 9: Real Earnings and Unemployment

Chart 1: GDP and Unemployment %

GDP

PERUN

Chart 2: Consumption (CE) and Investment (INV)

CE

INV

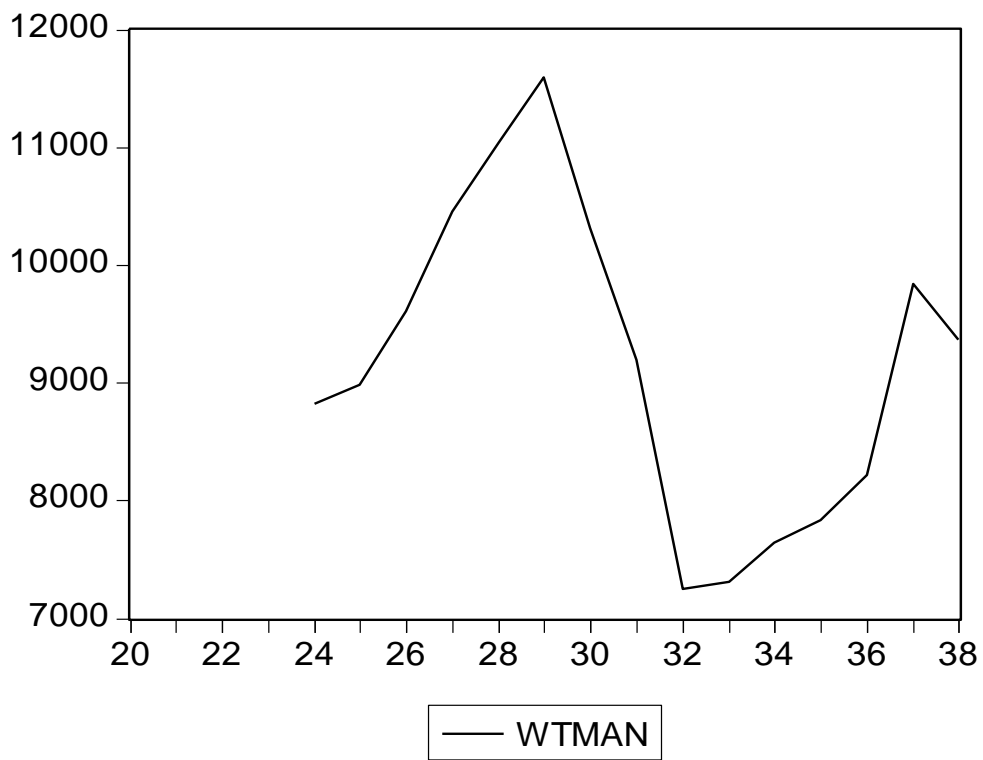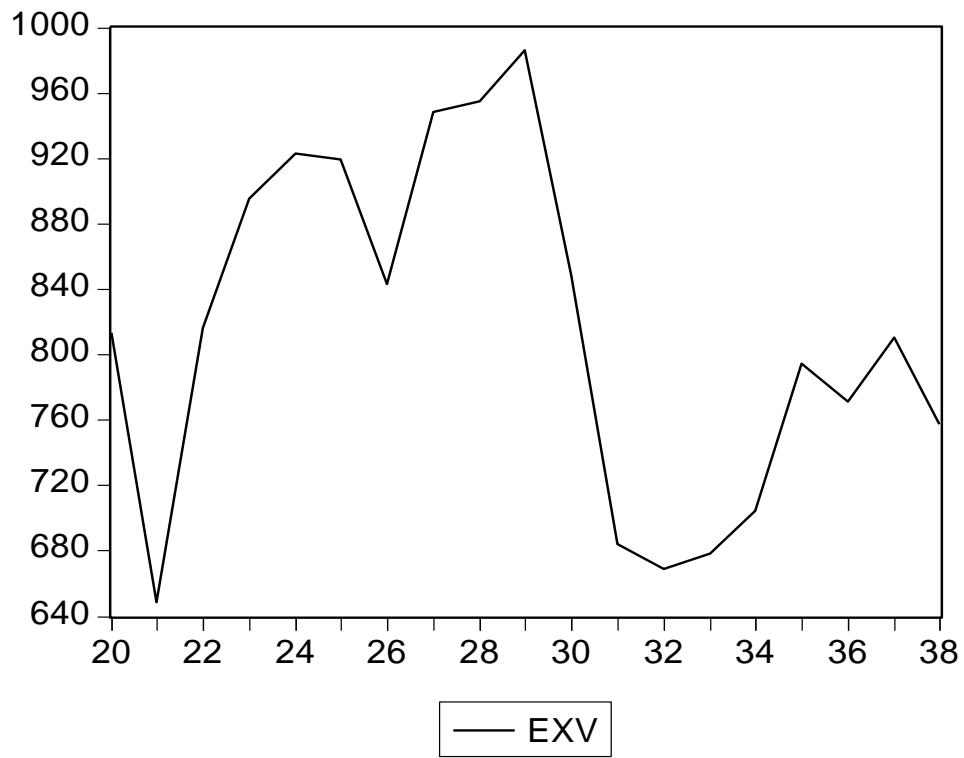Chart 3: UK Exports (EXV) and World Trade in Manufactures (WTM)

Chart 4: UK Imports and the Terms of Trade (TT=Export Prices/ Import Prices)
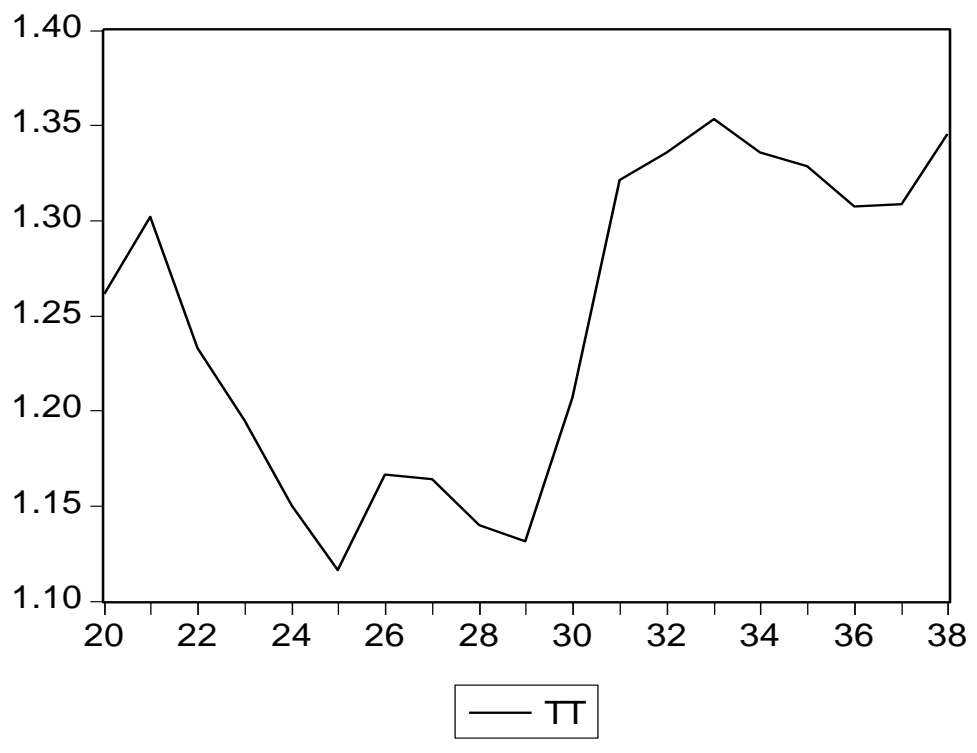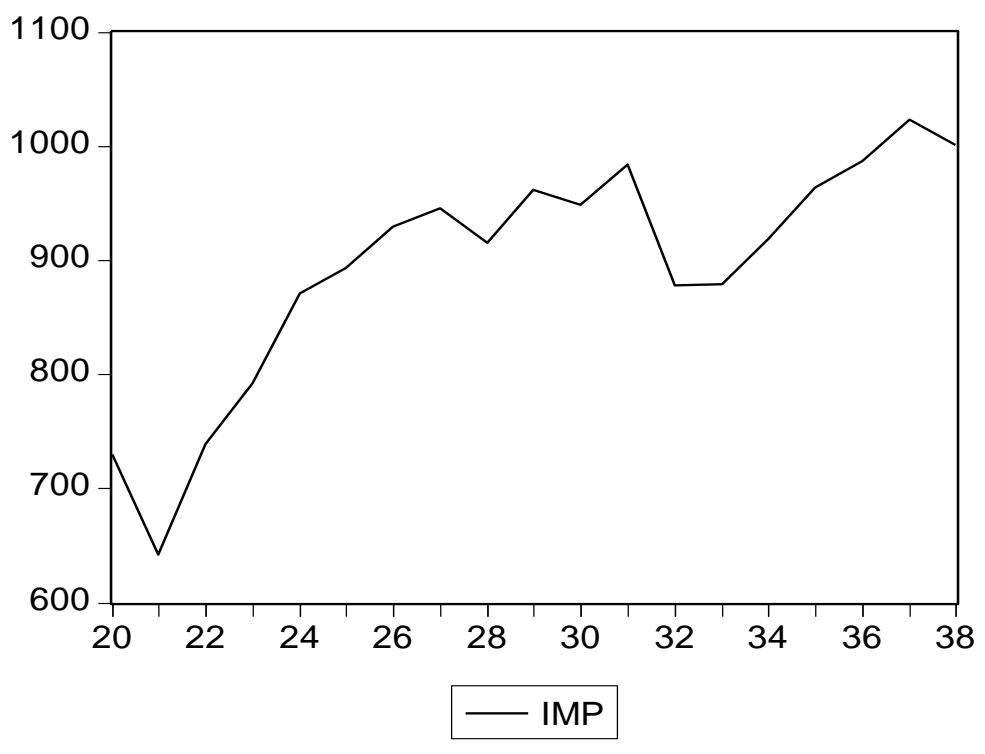

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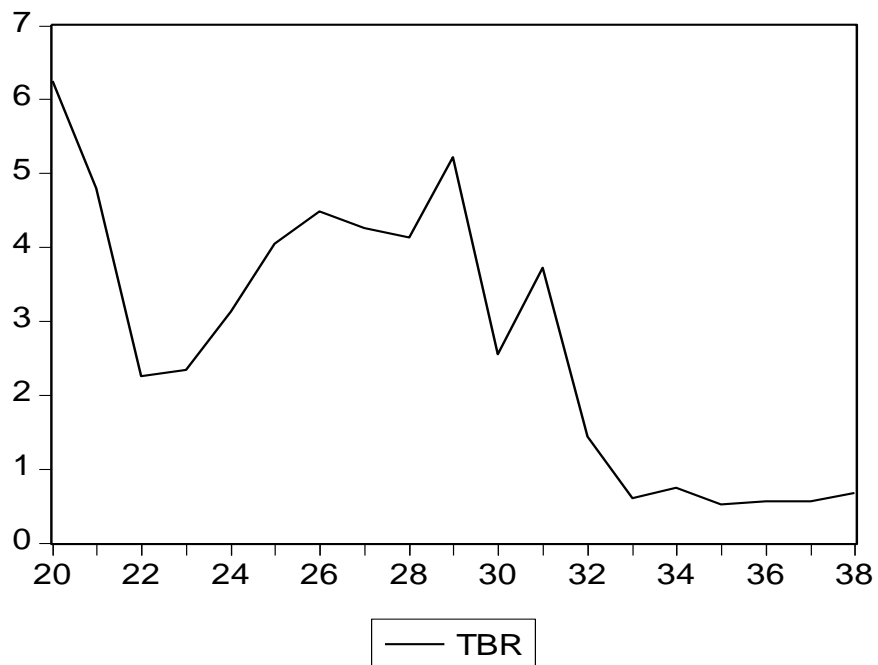Chart 5: Private Sector Investment in Housing (HINV) and Treasury Bill Rate (TBR %)
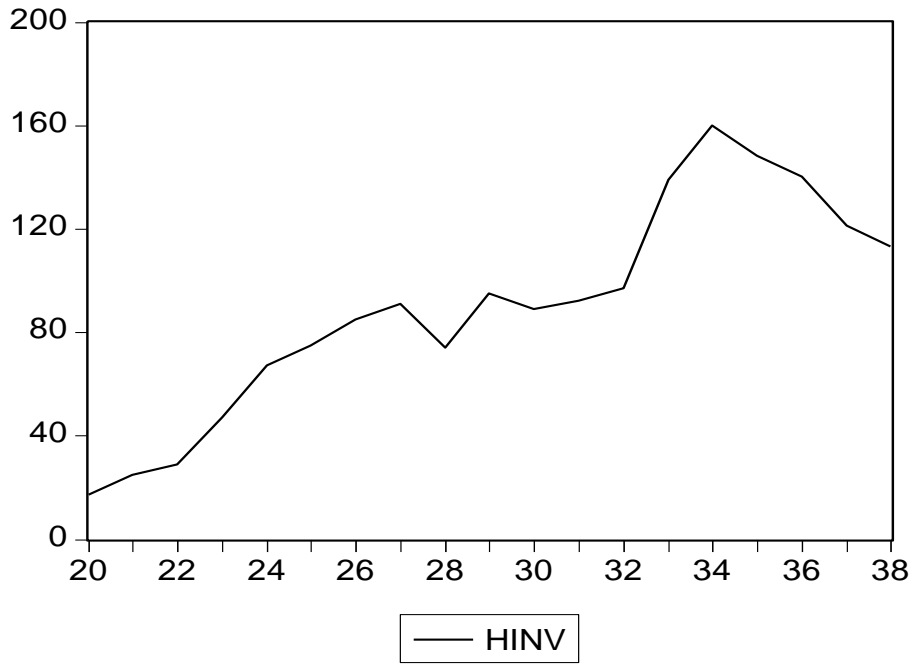
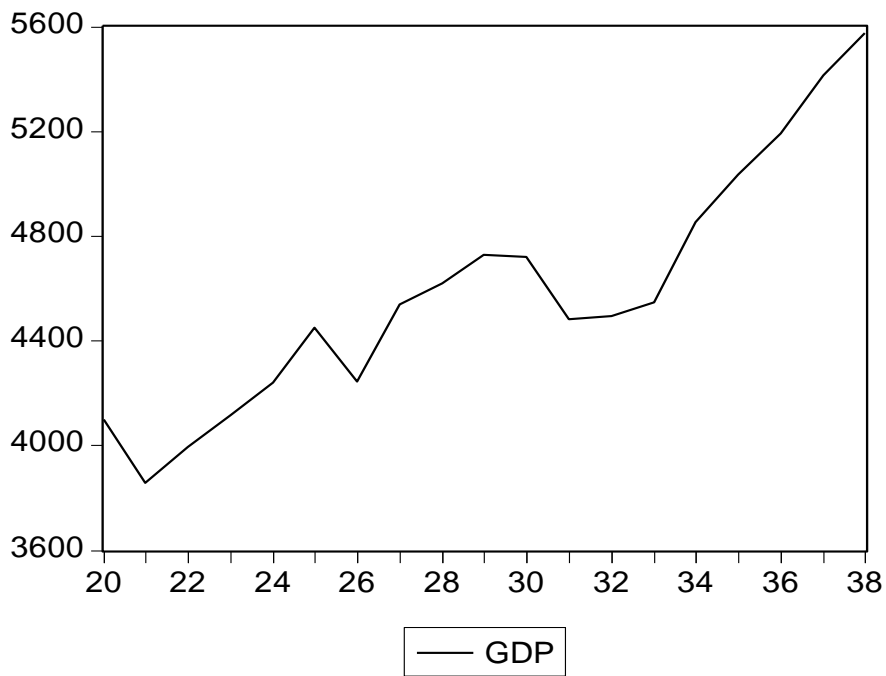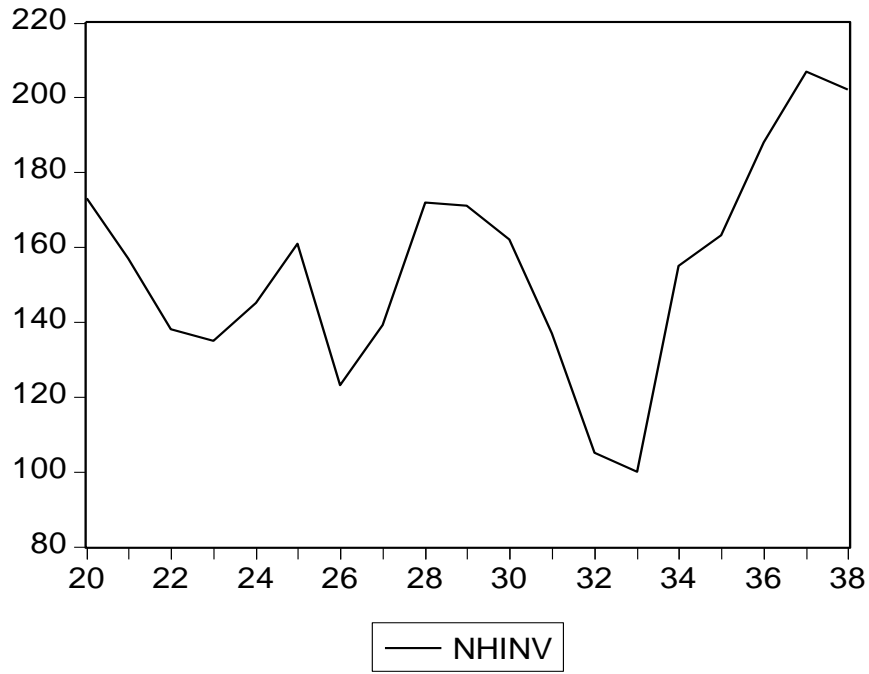Chart 6: Private Sector Non Housing Investment (NHINV) and GDP
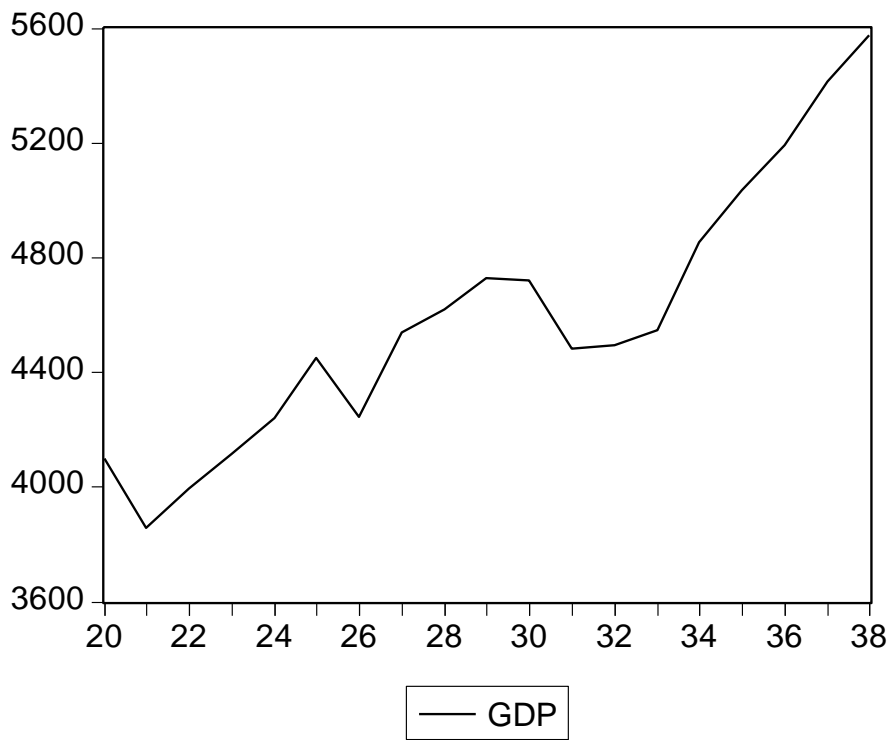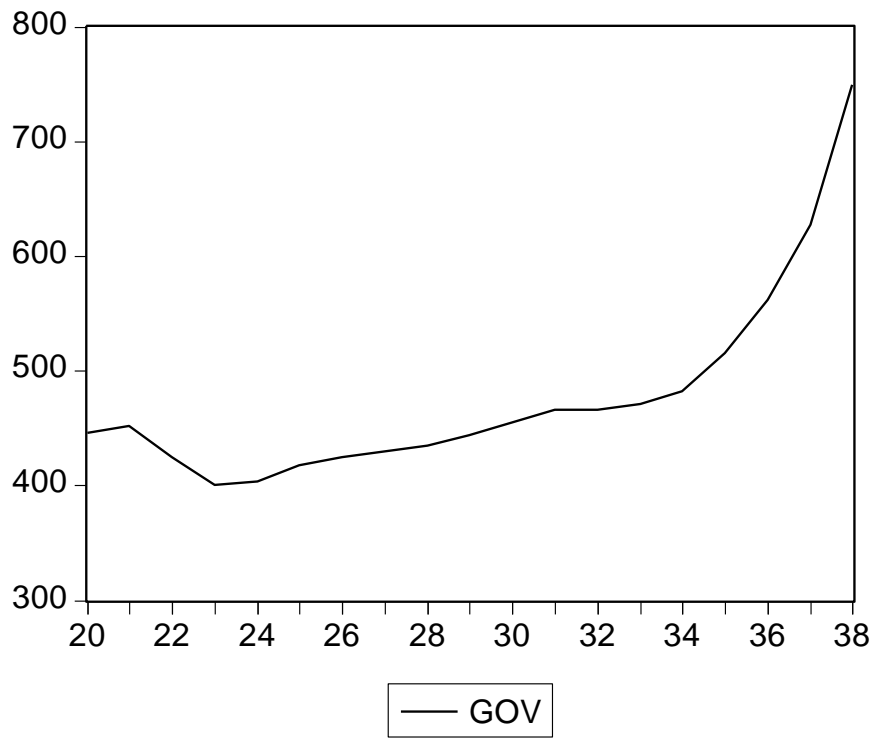
Chart 7: Government Spending on Goods and Services and GDP
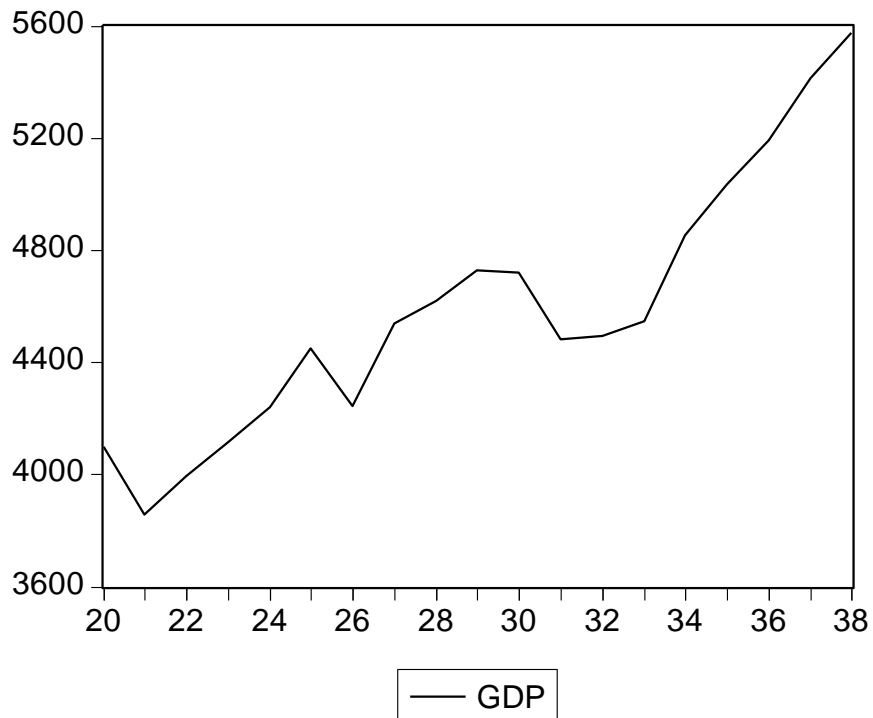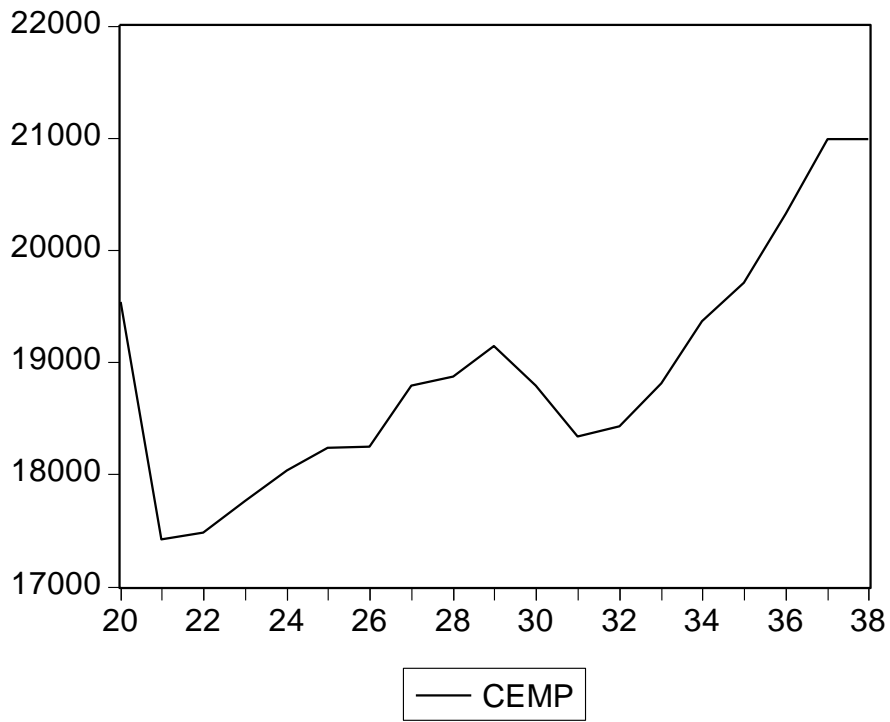
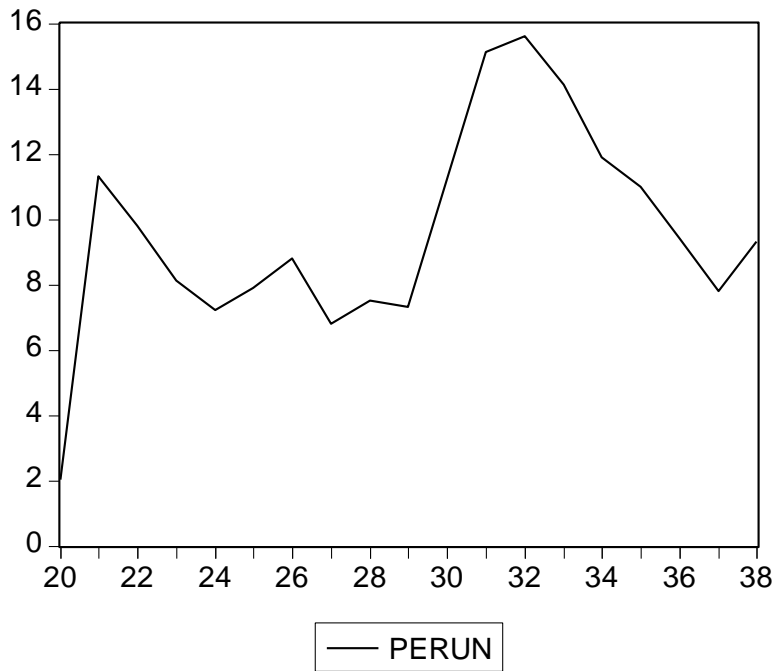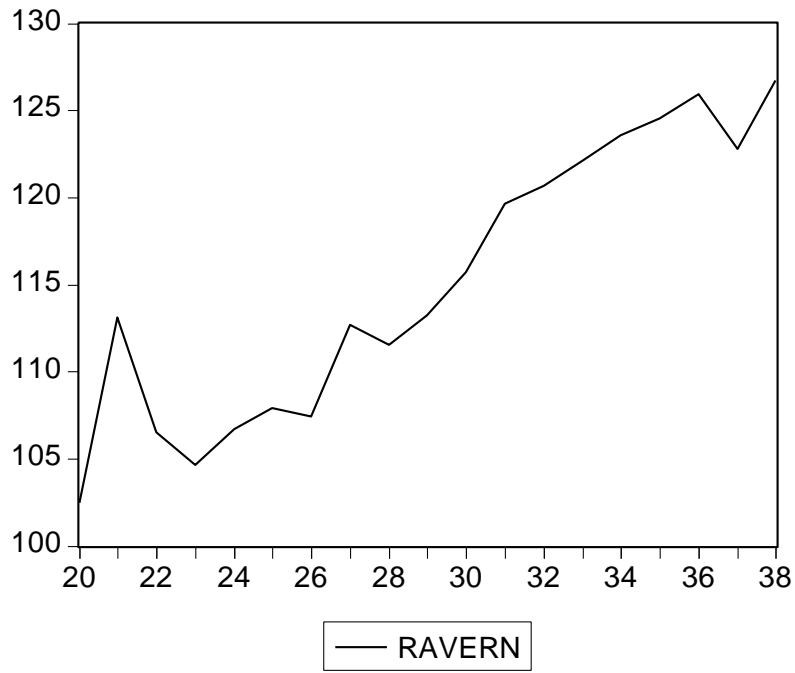Chart 8: Civil Employment (CEMP) and GDP

Chart 9 Real Earnings (Nominal Earnings/Output Price) and Unemployment %

RAVERN

PERUN

Interwar Simulations

List of Variables:

CE   Consumers' Expenditure

HINV   Private Sector Housing Investment

NHINV Private Non-Housing Investment

EXP   Exports

Cemp   Civil Employment

TBR   Treasury Bill Rate

Simulation 1: Exchange Rate held at 1929 Level and TBR at 3.59% (1931 level).

Deviation % from Base Run

Years	CE	HINV	NHINV	EXP	GDP	CEMP
1930	-0.01	-0.05	-0.25	-0.25	-0.07	-0.02
1931	-0.17	-0.65	-3.55	-4.09	-1.03	-0.26
1932	-0.95	-5.70	-16.86	-16.80	-5.05	-1.40
1933	-2.03	-25.88	-23.92	-20.68	-6.87	-2.47
1934	-2.52	-26.35	-16.97	-13.12	-5.71	-3.18
1935	-2.47	-20.78	-2.87	-8.21	-3.37	-2.83
1936	-1.58	-15.62	10.24	-2.59	-0.96	-1.46

Simulation 2: World Trade held at 1929 Level

Years	CE	HINV	NHINV	EXP	GDP	CEMP
1930	0.68	2.93	15.84	14.82	4.40	1.09
1931	1.87	3.84	36.42	27.90	8.35	2.52
1932	3.63	7.23	48.13	40.17	11.78	4.61
1933	5.16	7.88	41.89	39.63	12.17	5.86
1934	5.18	6.13	7.64	14.16	6.12	4.87
1935	3.89	6.41	-17.15	2.76	1.40	2.66
1936	1.87	4.56	-25.61	-6.27	-1.68	0.00

Simulation 3: Effect of Interest Rates on Activity

Holding TBR at 1929 level of 5.26%

Years	CE	HINV	NHINV		GDP	
1930	-0.17	-4.50	-3.68		-1.09	
1931	-0.36	-30.04	-3.29		-0.704	
1932	-0.09	-22.91	-4.09		-1.45	
1933	-0.16	-34.57	-3.25		-1.11	
1934	0.25	-38.90	-0.96		-0.87	
1935	0.80	-32.17	1.74		-0.22	
1936	1.32	-26.69	4.92		0.56	

Simulation 4: World Trade and Economic Recovery

World Trade Variables held at 1932 level

Years	CE	HINV	NHINV	EXP	GDP	CEMP
1933	-0.23	-0.98	-5.13	-6.50	1.53	-0.37
1934	-0.64	-1.31	-10.34	-9.29	-2.77	-0.85
1935	-1.25	-2.55	-13.57	-13.22	-4.07	-1.59
1936	-2.01	-3.71	-16.99	-18.90	-5.67	-2.38
1937	-2.88	-5.38	-21.60	-25.52	-7.78	-3.24
1938	-3.36	-5.23	-15.57	-20.22	-6.40	-3.37

Simulation 5: Expenditure on Defence and Recovery

Defence Spending held at 1935 level

Years	CE	HINV	NHINV	EXP	GDP	CEMP
1936	-0.08	-0.35	-1.88	0.01	-0.55	-0.13
1937	-0.36	-1.02	-6.67	0.06	-1.87	-0.51
1938	-0.75	-1.42	-9.27	0.15	-2.55	-0.94

Simulation 6: Government Expenditure and Recovery

Government Spending held at 1932 level

Years	CE	HINV	NHINV		GDP	CEMP
1933	-0.02	-0.10	-0.55		-0.16	-0.04
1934	-0.11	-0.30	-1.99		-0.55	-0.15
1935	-0.35	-0.96	-5.70		-1.63	-0.49
1936	-0.81	-1.80	-11.02		-3.20	-1.05
1937	-1.54	-3.21	-16.79		-5.20	-1.91
1938	-2.78	-5.96	-25.86		-8.72	-3.38

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Appendix

Structure of the model

1. Consumption function $\qquad$ $C = f_1(RPDY, \Delta Pc, Rl)$

2 Non-housing investment $\qquad$ $NHI = f_2(Y, Rl)$

3. Private housing investment $\qquad$ $IHP = f_3(RPDY, Pgdp, Rl)$

4. Stockbuilding $\qquad$ $\Delta St = f_4(Y, Rl)$

5. Export function $\qquad$ $X = f_5(WT_m, WT_{nm}, Pukm/Pwm)$

6 Import function $\qquad$ $IMP = f_6(Y, Pimp/Pgdp, \Delta St)$

7. Term structure of interest rates $\qquad$ $Rl = f_7(Rs)$

8. Employment function: output constrained Cost minimisation

$$N = f_8(Y, PROD, W/Pgdp, Pimp/Pgdp)$$

9. Price equation $\qquad$ $Ptfe/W = f_9(PROD, \Delta W, Pimp/Ptfe)$

10. Wage equation $\qquad$ $W/Ptfe = f_{10}(PROD, Pimp/Ptfe, U, TUD, RR, \Delta Ptfe)$

11. Other income $\qquad$ $OY = f_{11}(PDY)$

12. Direct tax function $\qquad$ $TAX = f_{12}(PERSY, SRT)$

13. Indirect tax function $\qquad$ $INTAX = f_{13}(TFE)$

14. Consumer expenditure deflator $\qquad$ $Pc = f_{14}(Ptfe)$

15. GDP deflator $\qquad$ $Pgdp = f_{15}(Ptfe, Pimp)$

16. UK export unit value index $\qquad$ $Pukm = f_{16}(Ptfe, Pwm, Pimp)$

17.' Short-term interest rate $\qquad$ $Rs = f_{17}(VEL, Y, DEBTR)$

Identities

1. Income-expenditure identity $\qquad$ $Y \equiv C + G + I + X - M - INTAX$

2. Personal disposable income $\qquad$ $PDY \equiv OY + (W \cdot N) - TAX$

3. Personal income $\qquad$ $PERSY \equiv PDY + TAX$

4. Unemployment $\qquad$ $UNEMP \equiv LS - N$

The definition of variables is conventional and should be clear from the title of each equation except that *WTm* and *WTnm,*. are world trade in manufactures and non-manufactures respectively. *TUD* is trade union density, *SRT is* the standard rate of income tax. and *DEBTR* is the ratio of short-term to total debt. There are also identities for the current balance, the budget surplus and the unemployment rate (u).