WAS THE COLLAPSE OF BRITISH INDUSTRY AFTER THE WORLD WAR INEVITABLE? STRUCTURAL AND MACRO-ECONOMIC EXPLANATIONS OF INTERWAR UNEMPLOYMENT

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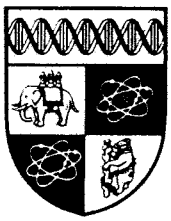

DEPARTMENT OF ECONOMICS

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ABSTRACT

In this paper we examine the importance of supply and demand shocks after the First World War at both the macroeconomic level and also in the key staple industries of pig iron and cotton textiles. As well as reconciling macroeconomic and structural explanations of interwar unemployment, this provides a much needed focus on the years immediately after the First World War, which despite Dowie's (1975) plea, have remained almost completely neglected.

I. INTRODUCTION

These are two very different strands in the economic history of interwar Britain. One strand stresses the importance of structural aspects of interwar dislocation, while the other stresses the importance of macroeconomic factors.

Advocates of the 'structural' explanation of post-First World War industrial collapse see it as the inevitable result of a structural problem, variously defined. The most coherent 'structural' explanation is that of Sandberg (1974) and McClokey (1981) who argue that Britain lost her comparative advantage in the traditional industries. This really amounts to a 'product cycle' argument. During the First World War other countries began or accelerated production of these products using cheap labour, so that Britain's comparative advantage was lost. The industrial boom of 1919-20 is thus seen as a speculative abberation before the inevitable foundering of Britain's traditional industries in the wake of foreign competition.

By contrast, most advocates of the macroeconomic explanation of industrial collapse see it as the result of destabilising monetary policy and therefore avoidable. Hawtrey (1938) argues that cheap credit during 1919-20 led to an excessive boom, while the subsequent rise in Bank Rate caused a massive destocking and exaggerated the slump of 1920-21. Howson (1975) is critical of Hawtrey for his emphasis on the role of inventories, and prefers to stress the impact of interest rates on fixed investment. Thus Howson shifts the emphasis from monetary policy as the initiating to the sustaining force behind the slump. Following Moggridge (1972), Howson assumes

that the pound was overvalued from 1925, and recognises the link of this to restrictive monetary policy.

These two views are clearly at odds with each other. However, more recently researchers in the macroeconomic tradition have begun to stress factors on the supply side.[1/] Unemployment is seen not just as the result of policy failures on the demand side, but also due to supply side factors such as high wages and unemployment benefits.

This suggests a possible reconciliation between the structural and macroeconomic views of interwar history. Adverse supply factors rendered British industry uncompetitive after the First World War. This naturally hit the export oriented old staple industries hardest. The difficulties of these industries in the face of rising unit labour costs were further exacerbated by deflationary policies in support of the return to gold at the prewar parity.

The fact that the macroeconomic supply and demand shocks were important explains the slowness of the emergence of the new industries as well as the dramatic speed of collapse of the old industries. The structural agreement about the inevitability of collapse, in the product cycle sense, therefore needs to be modified. But so, too, does the optimistic macroeconomic view that the high unemployment of the interwar period could have been avoided by simply changing monetary policy.

In this paper we examine the importance of supply and demand shocks after the First World War at both the macroeconomic level and also in the key staple industries of pig iron and cotton. As well as

marrying together the macroeconomic and structural arguments, this provides a much needed focus on the years immediately after the First World War, which despite Dowie's (1975) plea, have been curiously neglected.

II. THE STRUCTURAL VIEW

1. The Product Cycle Argument

Many strands of British economic history point to the emergence of a structural problem in interwar Britain. Richardson's 'overcommittment' thesis suggests that Britain's dependence on the four key export industries of cotton, iron and steel, coal and shipbuilding before 1914 was a fragile position. Although McCloskey (1981) is critical of Richardson's suggestion that this concentration on a few industries represents entrepreneurial failure in an 'ex ante' sense, he accepts that it created problems for the interwar economy, once demand conditions had changed.[2/]

The question, then, is what happened during the First World War to make Britain's industrial structure a problem? The usual answer given is that with the interruption of supplies, overseas countries began to produce their own goods to substitute for imports from Britain, and then competed with British exports in third markets, on the basis of cheaper labour. It is also usually argued that the war just exaggerated a trend that was already visible before 1914.

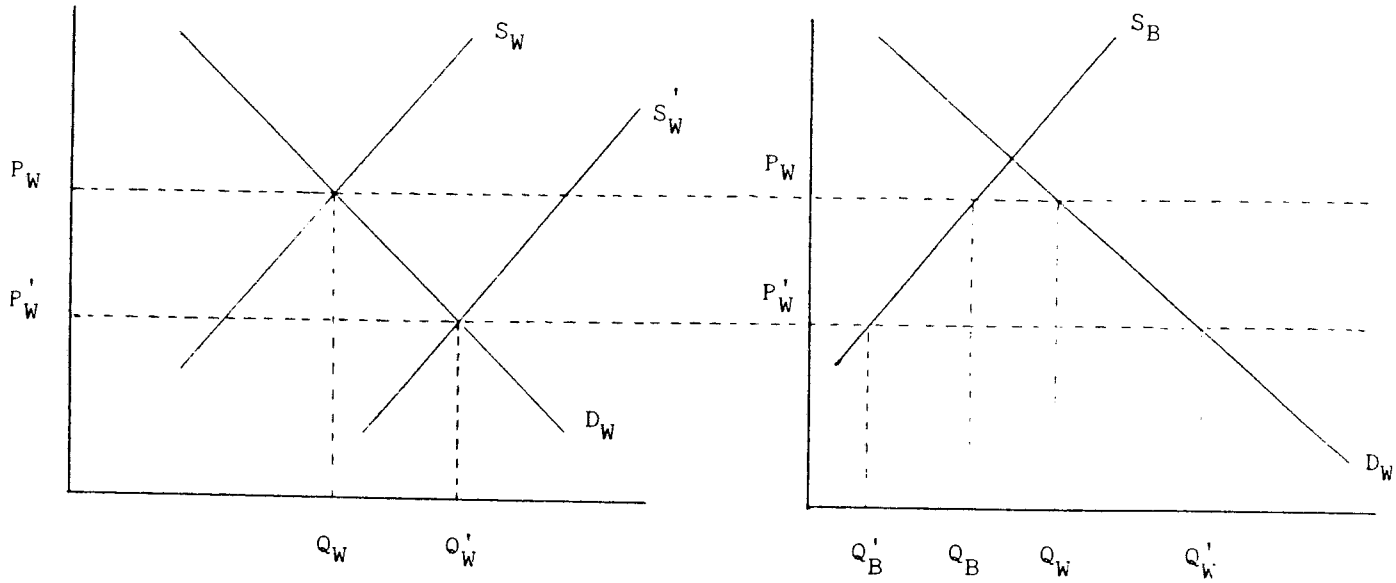
This is essentially a 'product cycle' argument, and is perhaps most forcefully stated by Sandberg (1974) for the case of cotton textiles. Britain is seen as having obtained a comparative

advantage through innovation during the early nineteenth century However, in the later stages of the product cycle, imitation and further technical progress made possible the use of cheap unskilled labour abroad, so that Britain lost her comparative advantage. The destruction of the British cotton industry, then, was inevitable, and there was no failure of entrepreneurship as Lancashire went into decline.

The argument is illustrated in Figure 1. Before World War I, in the left-hand diagram world supply and demand are given by Sw and Dw respectively. This yields a world price Pw and a quantity Qw. In the right-hand diagram, we still have world demand Dw, but British supply S_B. Given the world price Pw, Britain supplied Q_B of the world quantity Qw. Returning to the left-hand diagram, during the war we assume an increase in world supply to Sw' as overseas competitors begin production. This leads to a fall in the world price to Pw' and an increase in the world quantity to Qw'. In the right-hand diagram, with the lower world price Pw', Britain supplies a smaller amount Q_B' of the increased quantity Qw'.

Although Sandberg makes the argument originally with respect to cotton textiles, it is clear that McCloskey regards this as applicable to the old staples in general. Thus McCloskey (1981) finds no evidence of entrepreneurial failure in iron and steel or coal before 1914, while Harley (1971) exonerates British ship owners and, by implication, British ship builders[3/]. After the war, though, McCloskey (1981) argues that with hindsight, the concentration of resources in these industries appears unfortunate because of the changed conditions of the world between the wars.

FIGURE 1 : The Emergence of Cheap Overseas Competition



World Supply and Demand

British Supply and World Demand

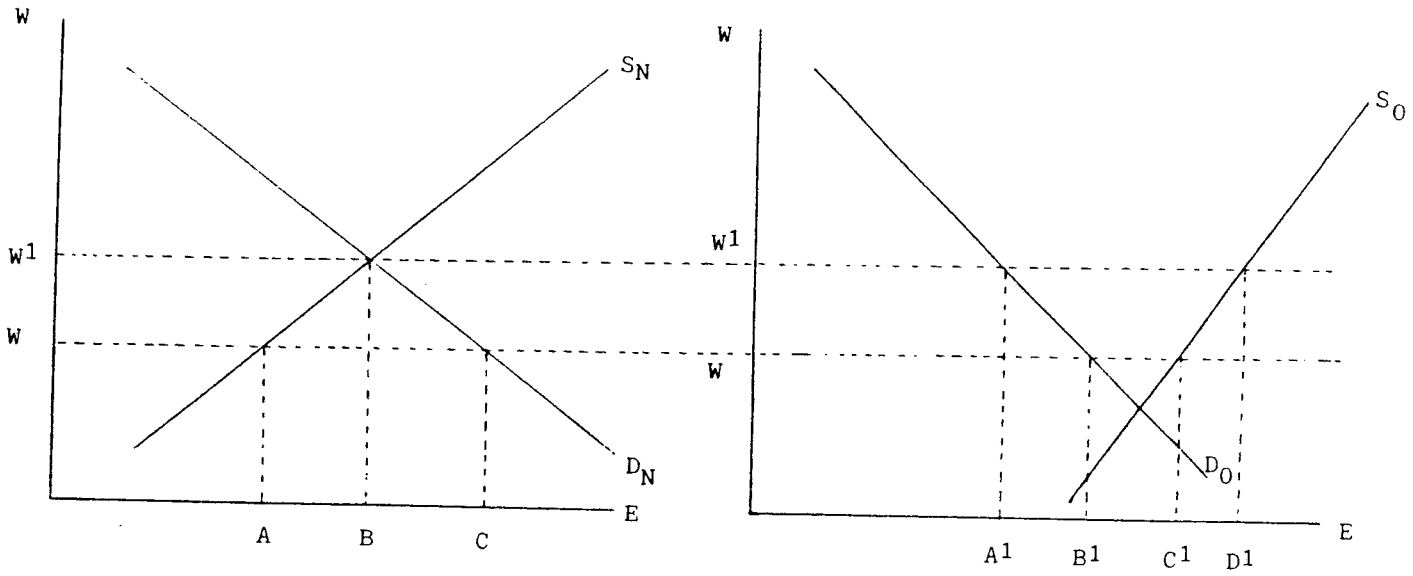
2. Structural Unemployment

Why should the contraction of the staple industries after the war have resulted in mass unemployment? Two contradictory answers have been given here. Firstly, Aldcroft (1967) argues that this led to a regeneration of British industry, with a fast structural shift of resources into the new industries, which were less labour intensive. However, as Broadberry (1986) shows, this view is simply wrong. Structural change between the wars was not unusually fast, and the new industries were not less labour intensive than the old staples.[4/] The second answer relies on a slow rate of structural change. Casson (1983) presents the clearest statement of this view, which harks back to the work of what Keynes (1936) derisively labelled the classical economists, such as Pigou, Robertson and Cannan.

Referring to Figure 2, which shows supply and demand for labour in the new and old industries, suppose there is initially unemployment $B'C'$ in the old industry with vacancies AC in the new industry. We have assumed for simplicity that the wage rate w is equal in the two industries, although this is not necessary. All we need to assume is that there is a union trying to maintain a wage differential established before the decline of the old industry. Casson notes that in the new industry we may expect the wage rate to rise to w' to eliminate the excess demand for labour. This would do nothing to eliminate the excess supply of labour in the old industry, however. Furthermore, if the union in the old industry is successful in maintaining the existing wage differential, the wage rate in the old industry will rise to w' and unemployment will rise to $A'D'$.

There has been a limited amount of econometric work to try

FIGURE 2 : Structural Unemployment



New Industry

Old Industry

to pin down the quantitative impact of structural factors. However, compared with recent econometric practice, the equations are very parsimonious and lacking in dynamics. Archibald, Kemmis and Perkins (1974) obtain implausibly high estimates of the equilibrium rate of unemployment ranging from 16.6 to 43.6%. Furthermore, the reported equilibrium rate is higher during the 1930s than the 1920s, which would cast doubt on the structural interpretation. Thomas and Stoney (1972) attempt to find a wage leadership role for London and the South East in a Phillips curve, but have identification problems because the low inflation and high unemployment of the period imply observations on the flat part of the Phillips curve. In the light of this, it is difficult to give much credibility to the quantitative estimates in the above work.

III. THE MACROECONOMIC VIEW

1. Monetary Factors

Most advocates of the macroeconomic view see the post war boom and slump as the result of monetary policy. Hawtrey (1938) is critical of the government for operating a lax monetary policy during the industrial boom of 1919, and argues that the raising of Bank Rate during 1920 was the major factor behind the slump. The basic transmission mechanism in Hawtrey's view was through the effect of interest rates on inventories. Throughout his book, Hawtrey emphasises the importances of business psychology, to explain how small changes in Bank Rate can have such dramatic consequences.

Clearly, since Hawtrey has no real theory of expectations, he can use this as a means to explain away any awkward facts.

However, even if we ignore the problem of expectations, as Howson (1975) notes, it is hard not to believe that the dramatic changes in the price level at this time would have swamped any effects of interest rate changes on inventories.[5/] If the price of stocks will fall by 10% in a year, this will dominate the effects of a 1 or 2% rise in interest rates.

Howson argues that monetary policy was more important in sustaining the slump rather than initiating it, through the effects of interest rates on investments.[6/] However, as Broadberry (1986) notes, the evidence on the interest elasticity of investment in interwar Britain is not very supportive of Howson's thesis.

Howson limits herself to a consideration of domestic monetary management, and defers to Moggridge (1972) on the question of the exchange rate. Howson accepts Moggridge's assumption of a 10% overvaluation of sterling with the return to gold in 1925, and argues that domestic monetary policy was subjugated to the exchange rate target.[7/] Thus for the period 1924-29 Howson sees deflationary monetary policy operating through the exchange rate as well as through investment. Surprisingly, however, Howson ignores the role of the real exchange rate during the slump of 1920-21. But as Broadberry (1986) argues, the real exchange rate rose by more at this time than during the period around 1925.[8/] It was also at a higher level than after 1925.

2. Aggregate Supply

Broadberry (1986) provides a summary of the recent macroeconomic work on interwar unemployment, which invariably stresses

aggregate supply rather than aggregates demand. Benjamin and Kochin (1979) began a very large literature on the role of unemployment benefits, while Beenstock et al (1984) have stimulated a related debate on the importance of real wages.

Whether unemployment is seen as the result of high wages or generous unemployment benefits, it remains true that such 'supply-side' unemployment could not have been cured simply by the use of monetary and fiscal policy. This brings the recent macroeconomic research on the interwar economy more in line with the 'structural' view, which also sees the high unemployment of the 1920s and 1930s as impervious to demand management.

IV. A PORTRAIT OF THE SLUMP

1. Introduction

Before we examine the macroeconomic evidence on the role of labour costs and the exchange rate in Britain's competitiveness, it will be instructive to make a brief quantitative survey of the British economy at this time. The picture painted at this time by Pigou (1947) and Morgan (1952) can now be made more precise with the data produced by subsequent scholarship, particularly by Feinstein (1972). A detailed discussion of data definitions and sources is given in an appendix.

2. GDP and Industrial Production

Perhaps the first surprise comes in Graph 1, with the comparison of industrial production and Gross Domestic Product

GRAPH 1 : GDP & Industrial Production

measured on the expenditure side. The boom in industrial production which Pigou and Morgan regarded as a speculative bubble, does not appear in Feinstein's GDP series. The reason is apparent from Graph 2, which illustrates a curiously under-emphasised feature of the postwar economy, the sharp fall in government expenditure. Clearly, any increase in aggregate demand from consumption, investment, stockbuilding and net exports during 1918-20 was more than offset by the fall in government spending.

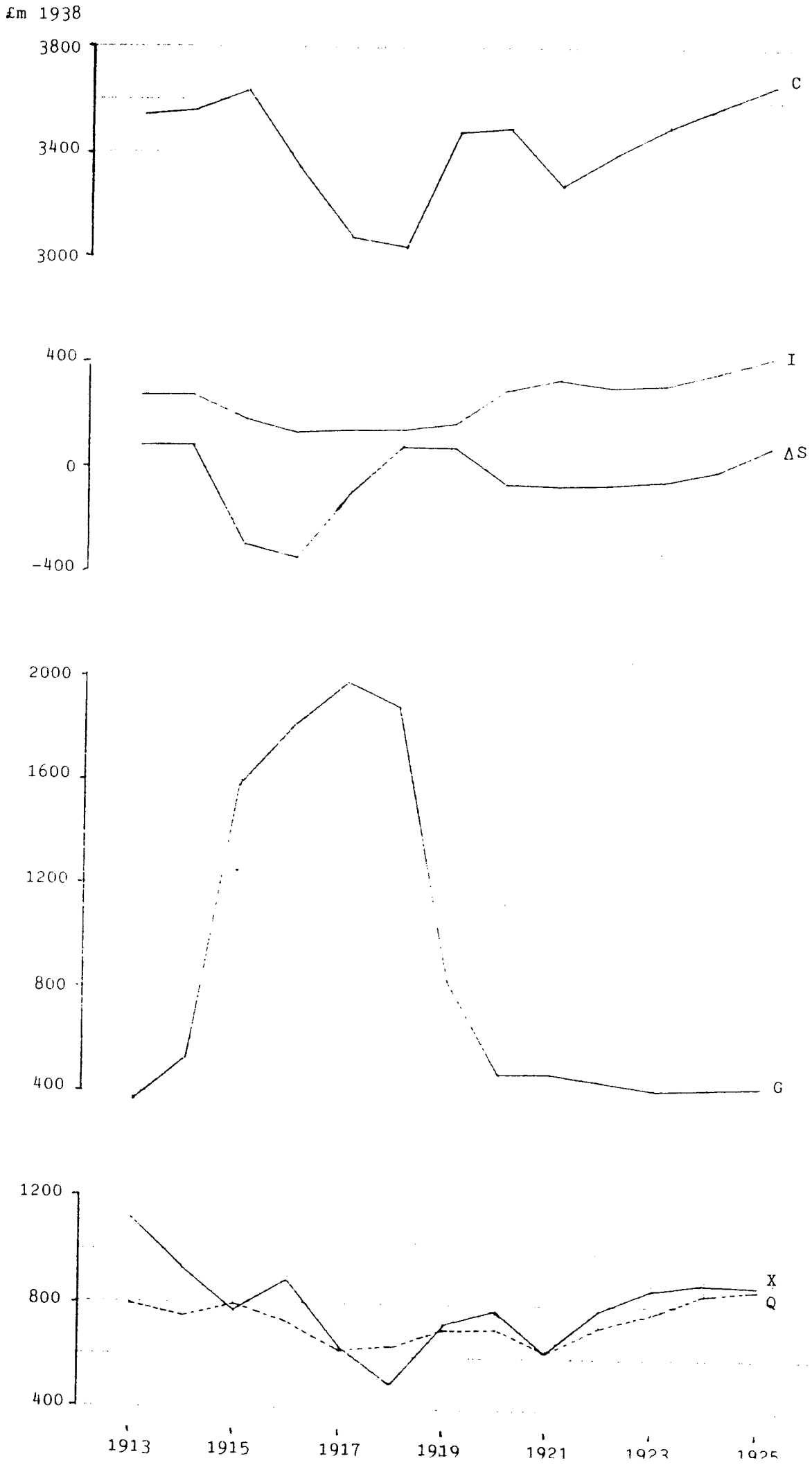
3. Categories of Expenditure

Despite the vastness of the fall in government spending after the war, Pigou (1947) and Morgan (1952) insist on emphasising the destocking and the fall in consumption as the sources of lower demand. Another interesting feature of Graph 2 is that fixed investment continued to rise during 1920-21.

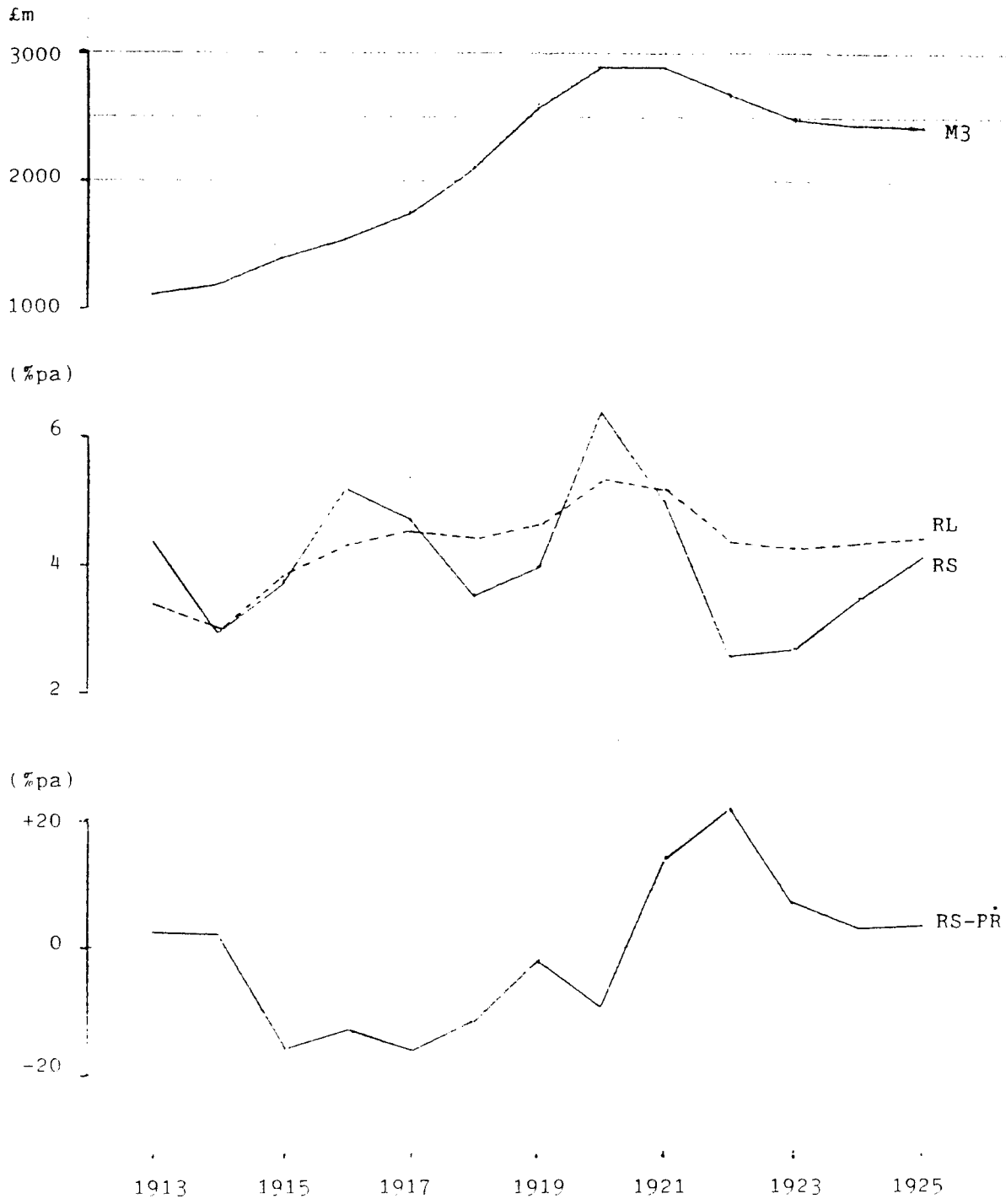
4. Monetary Variables

In Graph 3 we see the need to consider real rather than nominal interest rates with such large fluctuations in the price level. During 1919-20, when Hawtrey blames the start of the recession on rising Bank Rate, note that although nominal interest rates rise, the real rate falls sharply to nearly -10%. We only plot the ex post real short term rate, since the long rate is barely distinguishable on this scale. For real interest rates at this time were completely dominated by movements in the price level.

GRAPH 2 : Expenditure



GRAPH 3 : The Money Market



5. The Labour Market

Turning to the labour market in Graph 4, we plot civilian employment (E_C) and employment in the armed forces (E_F). As Pigou (1947) notes, the demobilisation was achieved quickly and smoothly, with a rise in civilian employment to offset the fall in the armed forces. However, the collapse of employment from the recession of 1920-21 is also clearly visible, and results in a massive rise in the unemployment rate, which remained high throughout the interwar period.

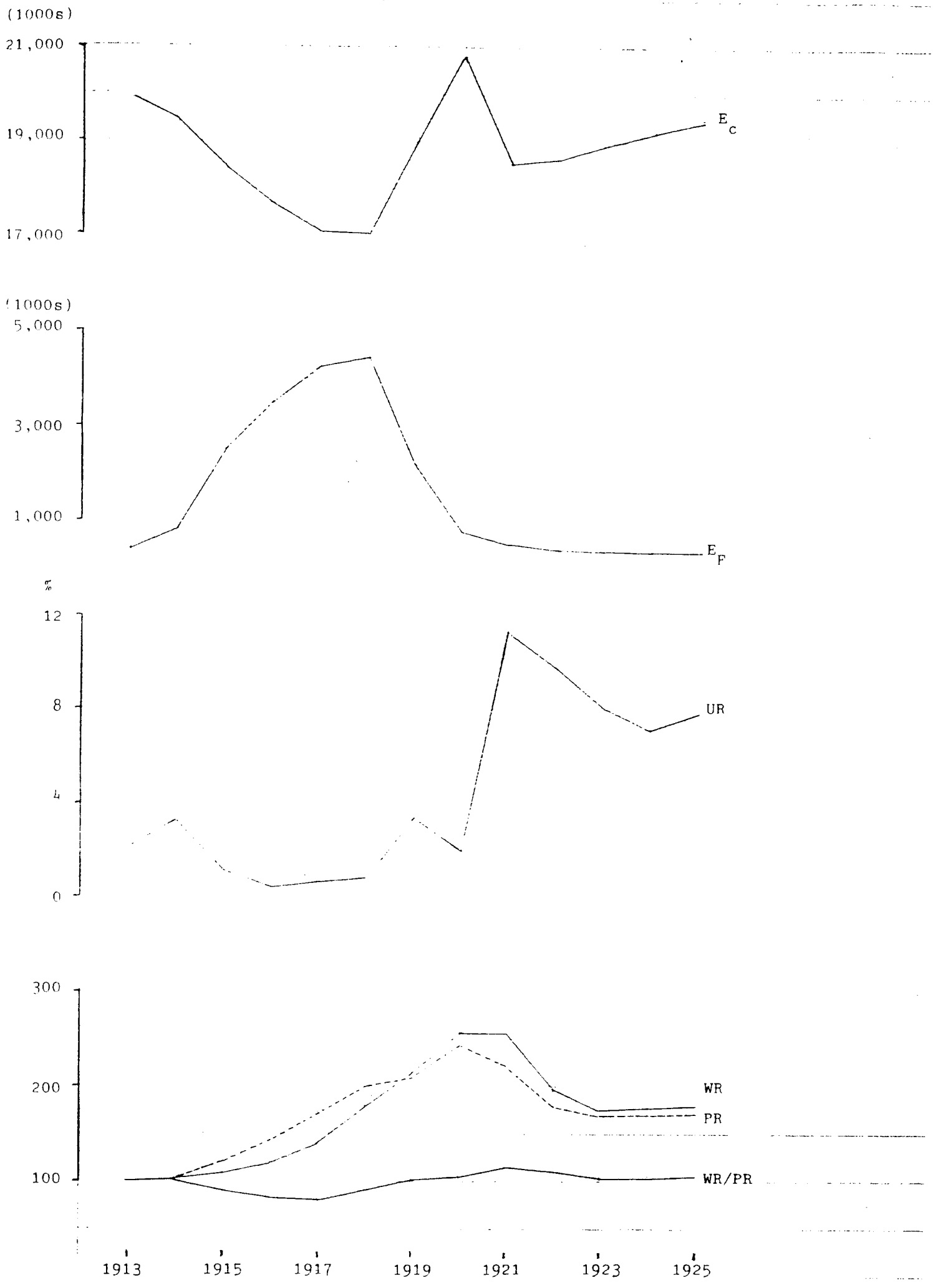
Nominal and real wage rates are also shown in this graph. During the war, nominal wages lagged behind rising retail prices, producing a fall in the consumption real wage. However, in the aftermath of war, nominal wages surged ahead of prices and then refused to fall as fast as prices from the peak of 1920.

V. MACROECONOMIC ASPECTS OF COMPETITIVENESS

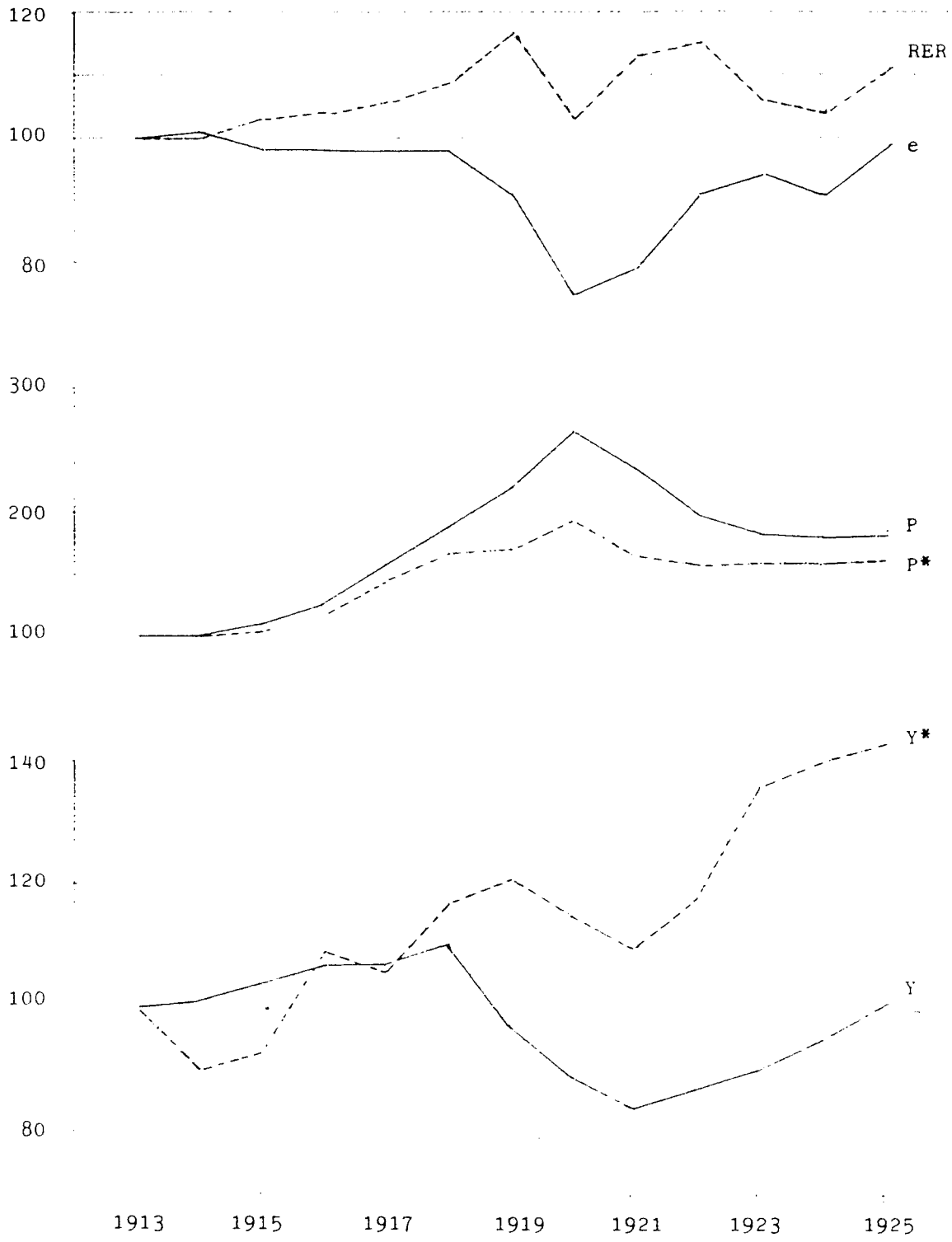
1. The Real Exchange Rate

In Graph 5 we compare Britain with the USA, the major gainer from World War I and Britain's major competitor.[9] The nominal exchange rate (e) fell after the abandonment of official support in 1919. From 1920, however, the pound appreciated back towards the official target of a return to gold at the prewar parity, finally achieved in 1925. Since price behaviour in the two countries was somewhat different, the real exchange rate also behaved differently. Since the higher inflation in Britain was accompanied by a return to the prewar exchange rate, there was a real exchange rate appreciation over the period as a whole, i.e. Britain's competitive position

GRAPH 4 : The Labour Market



GRAPH 5 : The External Sector



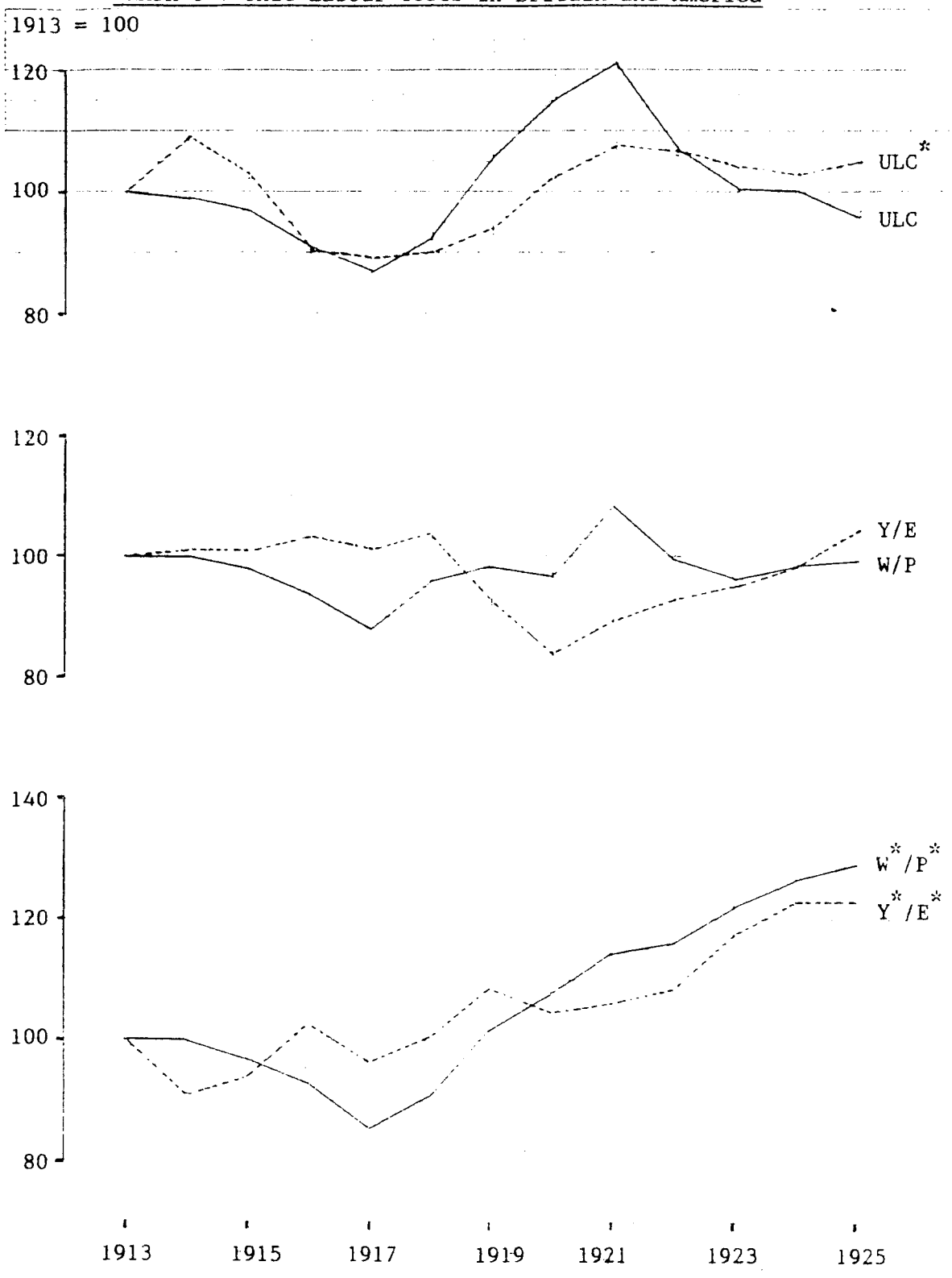
worsened. Broadberry (1987) notes that the literature has concentrated on establishing the extent of the overvaluation in 1925, and has thus ignored the impact of the high real exchange rate during the slump of 1920-21. This is particularly unfortunate, since the level of the real exchange rate (RER) is a matter of intense disagreement. Clearly there is room for big disagreements on the level of the RER, depending on the base year chosen and the price indices used. However, there is little controversy over the direction of changes in the RER, and it can surely be agreed that a rise in the RER adversely affects competitiveness, irrespective of whether or not the exchange rate is overvalued with respect to some ideal level. Thus we suggest that the rise in the real exchange rate during 1920-21 was a critical aspect of the slump which has been almost completely neglected.[10/]

2. Unit Labour Costs

In Graph 6, we present indices of unit labour costs (ULC) in Britain and America, together with their component parts, the real product wage and labour productivity. In the first panel we see that Britain's ULC rose particularly fast during the immediate postwar period. In the second panel we see that the reason for this was a fall in output per head (Y/E) accompanied by a rise in the real product wage (W/P).

As Broadberry (1986b) notes, this divergence between the real wage and productivity in Britain occurred as a result of a large decline in hours worked. In Broadberry (1987) it is argued that this preference for leisure resulted from a build-up of unspent purchasing

GRAPH 6 : Unit Labour Costs in Britain and America



power during the war. Rather than press for higher wages, workers pressed for shorter hours. However, this resulted in a rise in ULC because the government began a restrictive monetary policy to reduce prices and enable a return to the gold standard at the pre-war parity. The falling prices meant that real wages rose even without an increase in nominal wages, just as output per man fell with the shorter working week.

The contrast with the position in America, shown in the third panel of Graph 6 is striking. In America we see a strong growth of the real wage and labour productivity, with no period of sustained divergence. The stagnation in Britain over the period as a whole, with no growth trend in the real wage or labour productivity, demonstrates the importance of the trans-First World War period for Britain's relative standing in terms of per capita income. This issue is discussed further in Broadberry (1988).

2. Some Counterfactual Experiments

In this section we present an overall measure of competitiveness for Britain against America, and demonstrate the importance of the exchange rate and hours worked. The overall measure of competitiveness is given by Z_1, which measures relative unit labour costs, evaluated at the real exchange rate:

$$Z_1 = (ep/p^*) \frac{(W/P)/(Y/E)}{(W^*/P^*)/(Y^*/E^*)} = (ep/p^*) \frac{ULC}{ULC^*} \qquad (1)$$

Unit labour costs (ULC) are given by the ratio of the real product wage (W/P) and labour productivity (Y/E). Starred variables refer

to America, and unstarred variables to Britain. Relative unit labour costs are given by the ratio of ULC and ULC^*. However, we need to take account of exchange rate fluctuations, which affect competitiveness to the extent that they differ from relative price movements between the two countries. Thus we evaluate relative unit labour costs at the real exchange rate (ep/p^*), where e is the nominal exchange rate. In Graph 7 we see that overall competitiveness worsened substantially over the period 1918-23. The boom of 1920 was accompanied by an improvement in competitiveness (Z_1 fell) while the slump of 1921 was accompanied by a deterioration in competitiveness (Z_1 rose).

We now perform some counterfactual experiments to assess the importance of exchange rate fluctuations and the fall in hours worked for Britain's competitive position. We can assess the importance of real exchange rate fluctuations for competitiveness by considering the counterfactual situation where the exchange rate moves in line with relative prices, so that $(ep/p^*) = 1$. Thus we have our second measure of competitivness:

$$Z_2 = \frac{ULC}{ULC^*} \qquad (2)$$

In Graph 7, we see that Z_2 shows less of a deterioration in competitiveness after the First World War, since the damaging maintenance of the exchange rate (e) above the rate justified by relative prices (p/p^*) has been eliminated.

Finally, we can assess the impact of the fall in hours worked on Britain's competitiveness. Here we consider two

counterfactuals. Firstly, we consider in Z_3 the counterfactual position of unchanged American unit labour costs (ULC^*), but British unit labour costs calculated on the basis of an unchanged working week $(\hat{ULC})$. This is done by assuming that British unit labour costs would have fallen in proportion to the increased hours. This is simply the same assumption as that of Dowie (1975) who assume that unit labour costs were increased in proportion to the reduction in hours:

$$Z_3 = \frac{\hat{ULC}}{ULC^*} \tag{3}$$

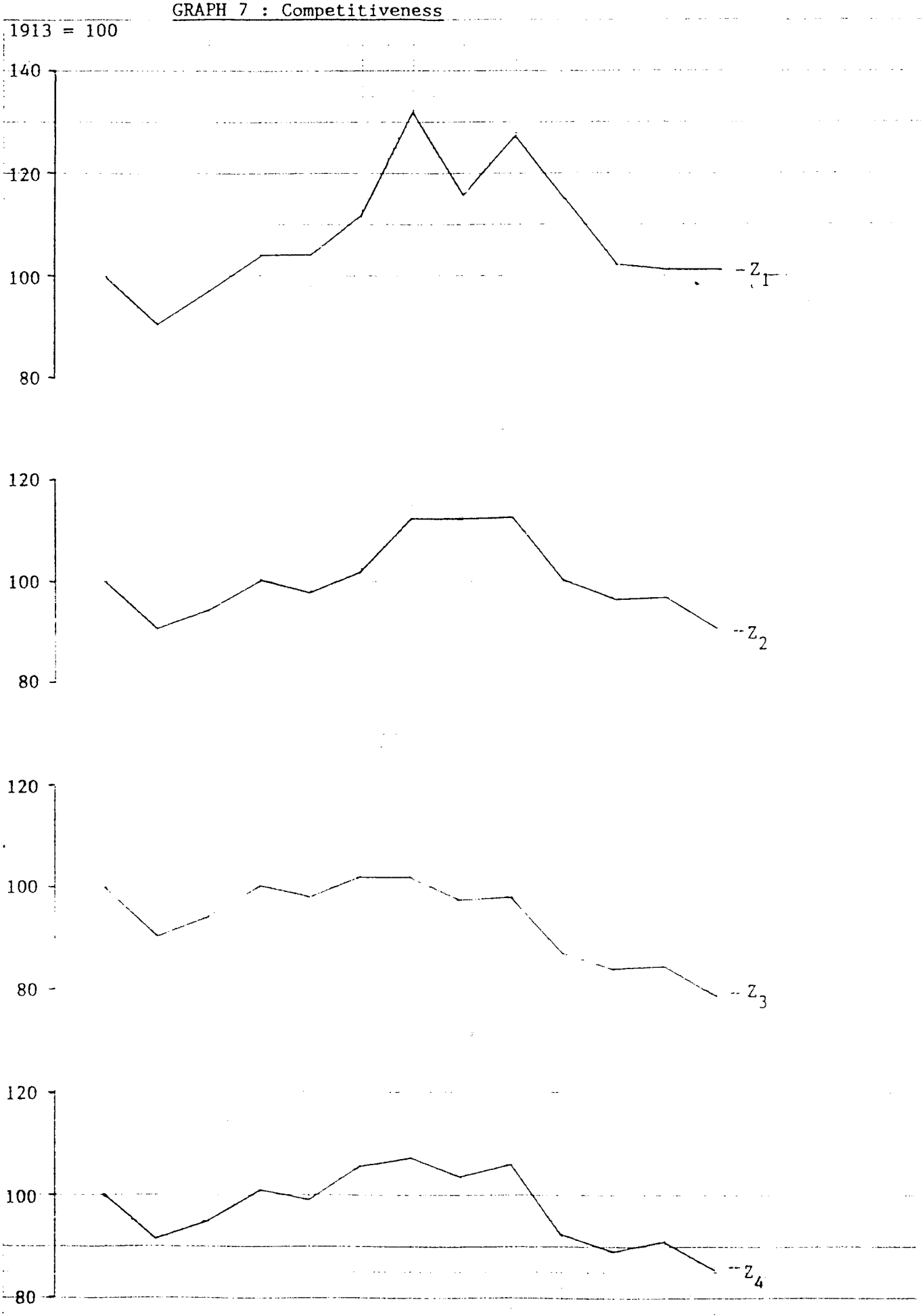
Comparing Z_3 and Z_2, we see that the rise in relative unit labour costs after the war is all but eliminated by holding hours worked constant.

Our second counterfactual adjustment to the working week treats Britain and America symmetrically, holding the standard working week constant in both countries. Thus we have:

$$Z_4 = \frac{\hat{ULC}}{\hat{ULC}^*} \tag{4}$$

where $(\hat{ULC}^*)$ is American unit labour costs calculated on the assumption of a constant working week. Although Z_3 is directly relevant for the counterfactual of an unchanged working week in Britain, Z_4 is included to bring home the fact that the sharp reduction in the working week after the war was a uniquely British phenomenon. Thus adjusting for constant hours in both countries in Z_4 still substantially reduces the hump in relative unit labour costs during the immediate postwar years.

GRAPH 7 : Competitiveness



At the macroeconomic level, then, the exchange rate and labour costs played an important role in the postwar slump. We now move on to consider the microeconomic evidence.

VI. COSTS IN BRITISH AND AMERICAN INDUSTRY

1. Introdution

So far our study has concentrated on trends at the macroeconomic level. In this section we make use of a quantitative study by Jones (1933) to examine costs in some of the key industries of the period.

In a truly pioneering study, Jones anticipanted the concept of total factor productivity (TFP). In fact, his index of 'real cost' is essentially the inverse of TFP:

$$TFP = \frac{WC}{SP} = \frac{\alpha_1 C_1 + \alpha_2 C_2 + \alpha_3 C_3}{SP} \qquad (5)$$

Here the weighted cost (WC) of producing a unit of output with selling price SP is calculated using indices of the price of inputs (C_1, C_2, C_3) and their weights in the production process ($\alpha_1 + \alpha_2 + \alpha_3 = 1$).

However, to take changes in real costs as increasing changes in efficiency requires the assumption of a constant mark-up of selling price over costs, as Allen (1979) notes. The point can be

made most simply assuming only one input, labour. Profit (Π) is given by the difference between revenue (P.Y) and costs (W.E)

$$\Pi = P.Y - W.E \tag{6}$$

If there is zero profit, under perfectly competitive conditions, say, then we have:

$$P.Y - W.E = 0 \tag{7}$$

hence:

$$\frac{Y}{E} = \frac{W}{P} \tag{8}$$

Real costs (W/P) can be taken as equivalent to productivity (Y/E). However, suppose there is a mark-up (M) of the selling price over costs, such that:

$$P.Y = M.W.E \tag{9}$$

then we have

$$\frac{Y}{E} = M.\ \frac{W}{P} \tag{10}$$

We can only take changes in real costs $\frac{W}{P}$ as indicative of changes in productivity (Y/E) if there is a constant mark-up (M).

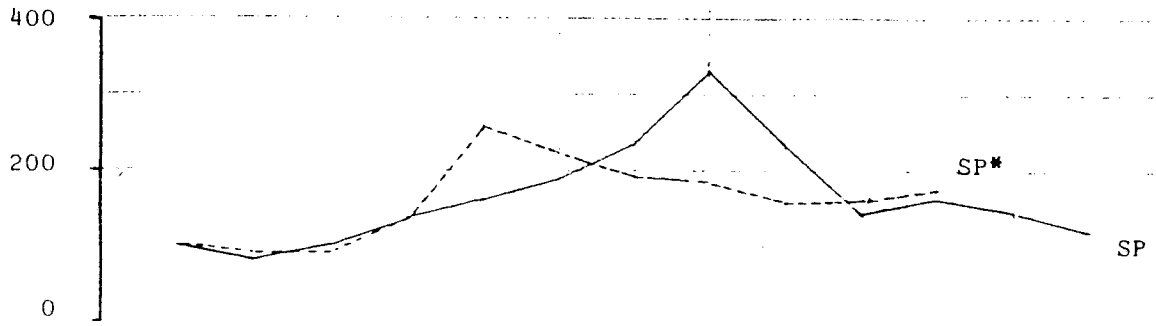
2. Pig Iron Production in Britain and America

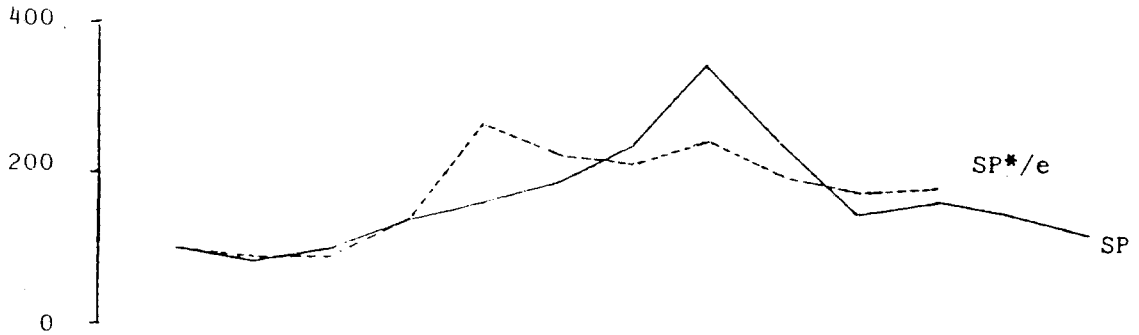
In this Section we consider the cost data of Jones (1933) on pig iron production in Cleveland and the USA. For Cleveland, Jones constructs indices in the selling price (SP) and four input costs, the price of ore (C_1), the price of coal (C_2), hourly wages of labour (C_3) and other costs (C_4). The weights (α_i) are based on the relative importance of these costs in 1910. For the USA, again Jones constructs indices of the selling price (SP^*), and the four input costs, the price of ore (C_1^*), the price of coke (C_2^*), hourly wages of labour (C_3^*) and other costs (C_4^*). Some interpolation was necessary for wages. The weights are based on 1913 shares.

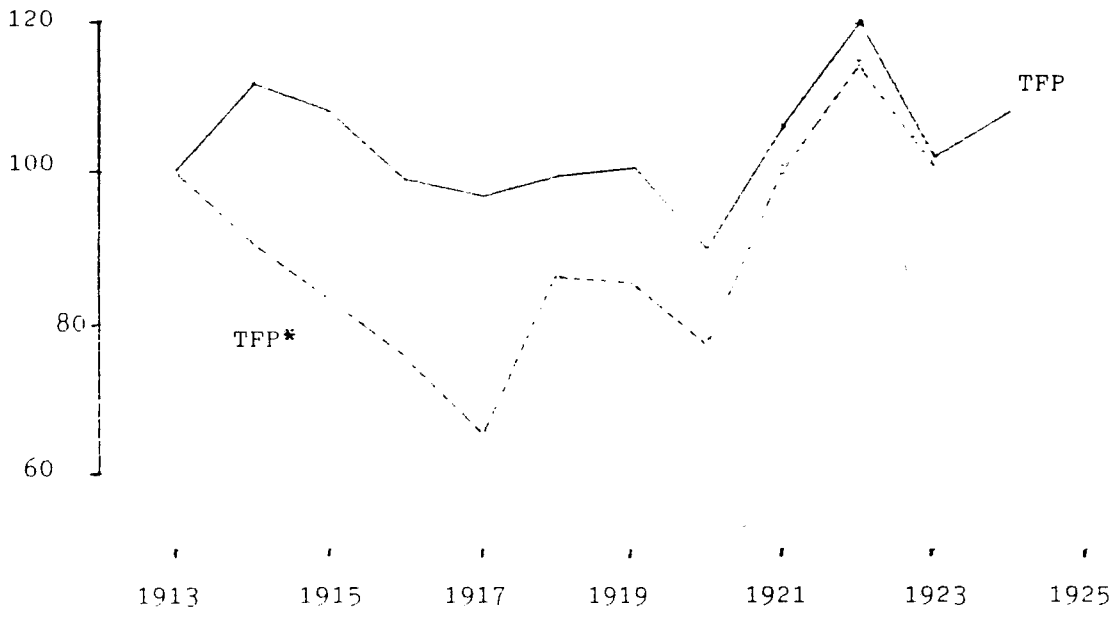
In Graph 8, we see a comparison of the selling prices in Britain (SP) and America (SP^*), measured in their own currencies and in a common currency. Thus SP^*/e gives an index of the American selling price measured in sterling. The difference between the first and second panels of Graph 8 illustrates the importance of the exchange rate in determining the size of the gap between the British and American selling prices. The depreciation of sterling during 1919-20 narrowed the gap (SP^*/e rose while SP^* fell) while the appreciation during 1920-21 widened it (SP^*/e fell by more than SP^*).

In the third panel of Graph 8 we plot the total factor productivity indices for Britain (TFP) and America (TFP^*). As we noted in the last section, however, we should not simply take these indices as measures of efficiency since profitability was surely not constant over this period. We see that during the war, costs as a

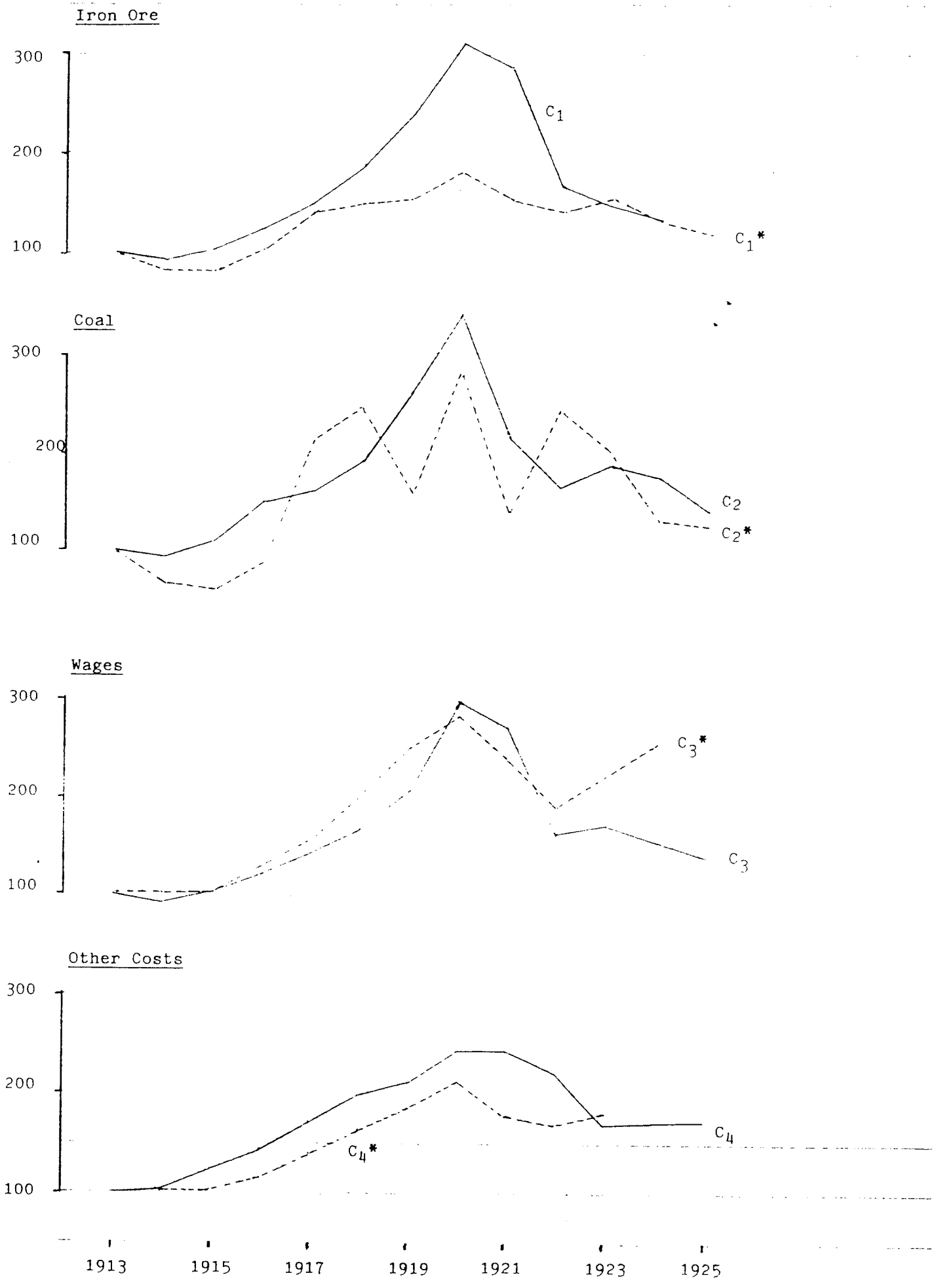
GRAPH 8 : The Pig-Iron Industry







GRAPH 9 : Costs in The Pig-Iron Industry (1913=100)



proportion of selling price fell, indicating profiteering, while the share of costs rose after the war with the return of competition. The fact that the ratio of the index of costs to the selling price was higher in Britain should be taken as an indicator of British weakness, as Allen (1979) argues for the period before 1914. British firms could compete only by accepting a lower mark-up. This is particularly true of the slump, with weighted costs rising by over 20% more than the selling price.

In Graph 9 we examine the various components of costs in the British and American industries. It is clear that a divergence of ore prices (C_1 and C_1^*) was a very important element in Britain's loss of competitiveness. In addition, wage costs in Britain (C_3) rose above those in America (C_3^*) just at the start of the slump in 1920-21.

Thus we see that for the iron industry, during the slump 1920-21, as the exchange rate appeciated, British prices could not be lowered enough to compete with American prices, since mark-ups were already very low. Costs were high partly due to labour costs, but also due to high ore prices.

3. The Cotton Industry in Britain and America

Again we take as a starting point the data of Jones (1933) on the cotton industries of Lancashire and Massachusetts. For Lancashire, Jones constructs indices for the selling price of cotton cloth (SP), and three input costs, the price of raw cotton (C_1), weekly wages (C_2) and other costs (C_3). The wage data were adjusted to an hourly basis (C_{2A}) by making allowance for the

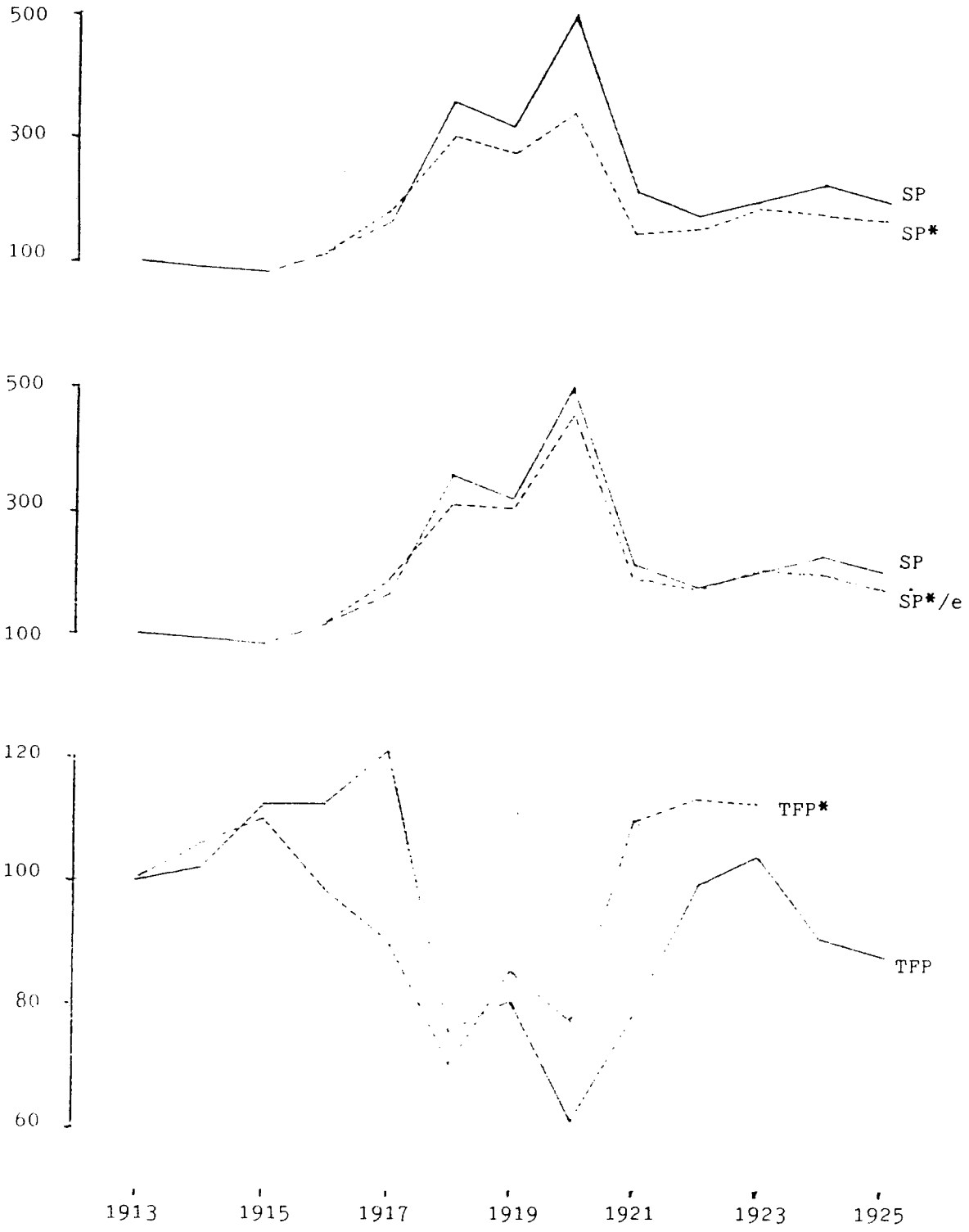
reduction in the working week during 1919 from 55½ to 48 hours. The weights (α_i) are based on the relative importance of these costs in 1910. Since Jones' data for Massachusetts stop in 1920, we have used data constructed by O'Mahony (1987) for the US cotton industry as a whole. The selling price of cotton cloth (SP^*) continues Jones' series, while the raw cotton price (C_1^*) is taken from the US Bureau of the Census (1960). Wage data (C_2^*) are taken from the US Bureau of Labour Statistics Bulletin. Since wages were only available biennially, linear interpolation was necessary. For other costs (C_3^*), the general price level from Jones was used.

In Graph 10 we compare the selling prices in Britain (SP) and America (SP^*) measured in their own currencies and in a common currency. Thus SP^*/e gives an index of the American selling price measured in sterling. Comparing the first two panels of Graph 10, we see the importance of the exchange rate in determining the selling price. Measured in a common currency, the two series move more or less in line.

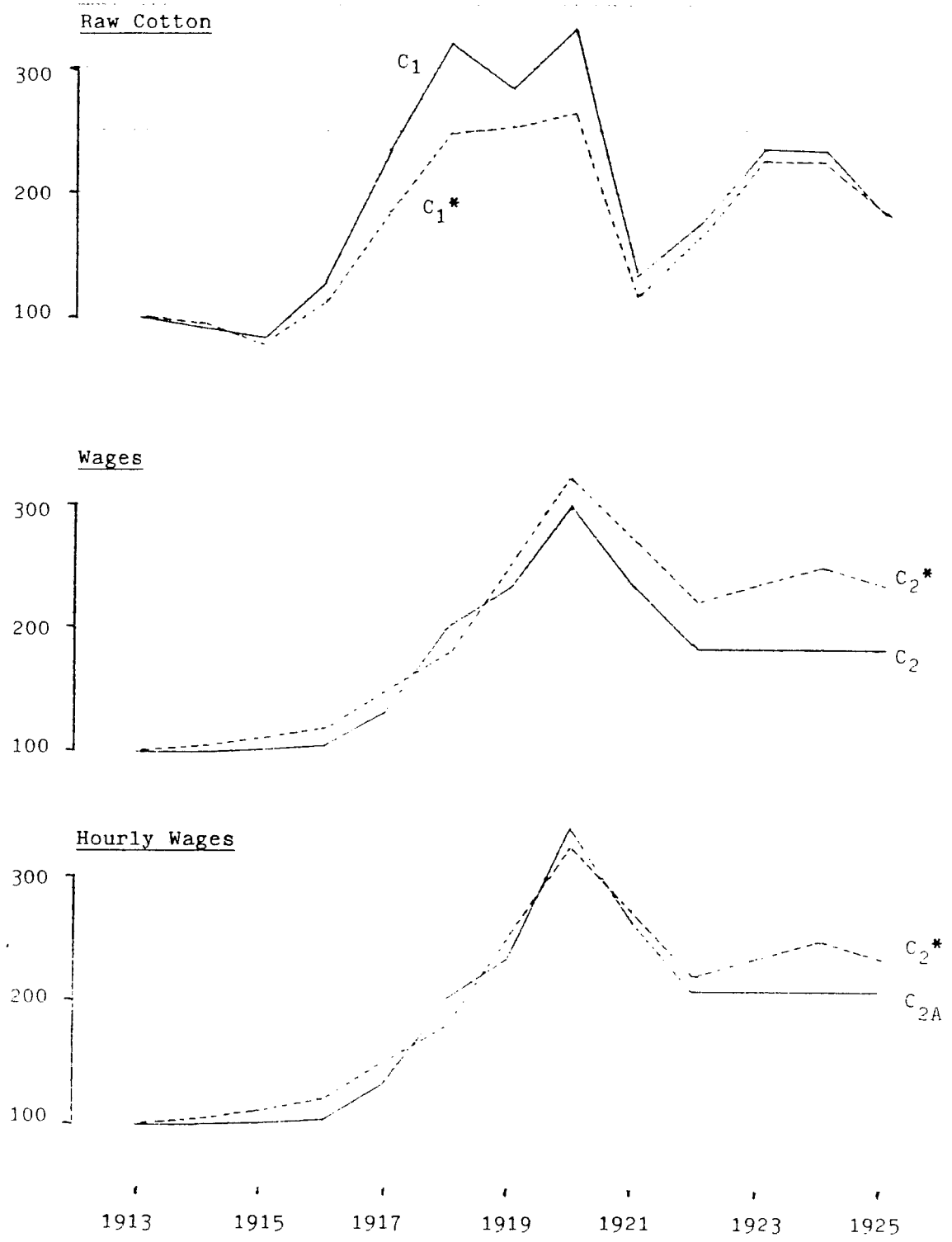
The third panel of Graph 10 also indicates similar movements in TFP for the two countries. As with the case of the iron industry, we regard the sharp movements in the ratio of the index of weighted costs to the index of the selling price as indicative of movements in the mark-up, not just efficiency. Clearly there is evidence of profiteering during the war and also during the postwar boom, with weighted costs falling by nearly 40% more than the selling price in Britain in 1920. By 1922, however, costs and the selling price had moved by roughly proportionate amounts.

In Graph 11 we plot the cost of raw cotton in Britain (C_1)

GRAPH 10 : The Cotton Industry



GRAPH 11 : Costs in the Cotton Industry



and America (C_1^*) and labour costs in the two countries. In the second panel we plot weekly wages in Britain (C_2) and hourly wages in America (C_2^*), while in the third panel we allow for the change in hours by plotting hourly wages in Britain (C_{2A}) as well as in America (C_2^*). Adjustment for hours worked makes the difference between an increase in relative wages in Britain (using the hourly series) and an increase in relative wages in America (using the weekly series) for 1920.

However, the overall impression from the cost data is of co-movement in Britain and America. For at this time, the American cotton industry was also in decline, as Wright (1981) notes. In fact, Wright is clear that a major problem in the American cotton industry at this time was a large rise in the real wage, particularly in the South, which was taking over from Massachusetts as the centre of the American cotton industry. Japan was the major gainer from this self-imposed competitive deterioration in Britain and America. Thus our study of the cotton industry does indeed serve to underline the importance of labour costs, and provides further evidence that the collapse of British (and in this case American) industry was not inevitable.

Thus we see that for the cotton industry, during the slump of 1920-21, as the exchange rate appreciated, competition forced British prices to adjust downwards to compete with American prices. Labour costs were similar in Britain and America, but both countries lost out to Japan.

4. Competitiveness and Loss of World Market Share by Commodity

If the product cycle view of Britain's loss of competitiveness is true, then loss of world market share should be confined to a few products. On the other hand, if the macroeconomic view is correct, then loss of world market share should be broadly spread across many commodities.

We can check this by examining data on world trade shares from Tyszinski (1951). His data are conveniently summarised for the period 1913-29 by Aldcroft (1970). Reproducing his calculations here, in Table 1, we see that Britain lost market share in most manufactured commodities, whether world trade in those commodities was expanding, stable or declining.

Clearly, the loss of market share in textiles and iron and steel was severe, but the biggest proportionate loss was in agricultural equipment, while there were also substantial losses in motor vehicles and aircraft and industrial equipment.

Maizels (1965) performs some counterfactual experiments to assess the relative importance of factors underlying the change in British exports during 1913-29, as well as during a number of other periods. Using shift-share analysis, he breaks down the change in the constant price value of manufactured exports into three parts attributable to the size of the world market, the area/commodity pattern of trade and the competitive share of individual markets. For 1913-29, the size of the world market acted to increase Britain's exports, while the area/commodity patterns had a negligible effect, and the share of individual markets acted to reduce Britain's exports.

The loss of competitive share outweighted the expansion of the world market so that the overall constant price value of manufactured exports fell. The insignificance of the area/commodity pattern of trade, and the importance of the competitive share in each market are consistent with the macroeconomic rather than the structural view.

TABLE 1 : World Trade Shares Gained or Lost by UK 1913-29

	(%)
Expanding Groups	
Motor Vehicle and Aircraft	-5.4
Industrial Equipment	-7.2
Iron and Steel	-10.6
Electrical Goods	-1.9
Stable Groups	
Agricultural Equipment	-14.4
Chemicals	-3.1
Non-ferrous Metals	+3.5
Non-metalliferous Materials	-0.3
Miscellaneous Materials	-0.2
Other Metal Manufacturers	-7.1
Books, Films etc.	+6.5
Declining Groups	
Textiles	-8.8
Drink and Tobacco	+7.9
Railway, Ships	-2.3
Apparel	-5.5
Miscellanous Manufactures	+1.5
Total (all groups)	-6.3

Source: Aldcroft (1970), Table 31, p.249.

VII. CONCLUSION

In this paper we examine the importance of supply and demand shocks after the First World War at both the macroeconomic level and also in the key staple industries of pig iron and cotton textiles. As well as reconciling macroeconomic and structural explanations of

interwar unemployment, this provides a much needed focus on the years immediately after the First World War, which despite Dowie's (1975) plea have remained almost completely neglected.

APPENDIX : DATA DEFINITION AND SOURCES

Graph 1 : GDP and Industrial Production

GDP = Gross Domestic Product, based on expenditure at market prices in £m 1938. Plotted in index number form (1913 = 100). Source: Feinstein (1972) Table 5. Adjusted to include Southern Ireland throughout the period.

IP = Industrial Production, total All Industries (1913 = 100). Source: Lomax (1959) Table 1.

Graph 2 : Categories of Expenditure

C = Consumers' Expenditure.
I = Gross Domestic Fixed Capital Formation.
ΔS = Change in Stocks.
G = Government Expenditure on Goods and Services.
X = Exports of Goods and Services.
Q = Imports of Goods and Services.

All series based on expenditure at market prices in £m 1938. Source: Feinstein (1972) Table 5. All series adjusted to include Southern Ireland throughout the period.

Graph 3 : The Money Market

M3 = Broad money (£m). Source: Capie and Webber (1985) Table 1.(3).
RS = Three-month bank bill rate (rate on prime bills) (% per annum). Source: Capie and Webber (1985) Table III.(10).
RL = Yield on Consols (% per annum). Source: Capie and Webber (1985) Table III.(10).
PR = Retail price index (1913 = 100). Source: Feinstein (1972) Table 65.

RS-PR = Real rate of interest. Nominal interest rate minus the rate of inflation.

Graph 4 : The Labour Market

E_C = Civilian Employment (1000s). Source: Feinstein (1972) Table 57.
E_F = Employment in the Armed Forces (1000s). Source: Feinstein 1972) Table 57.
UR = Unemployment Rate (= unemployed as a percentage of the civilian working population, (%). Source: Feinstein (1972) Table 57.
WR = Average weekly wage rates (1913 = 100). Source: Feinstein (1972) Table 65.
PR = Retail Price Index (1913 = 100). Source: Feinstein (1972) Table 65.
WR/PR = Real consumption wage.

Graph 5 : The External Sector

e = Nominal exchange rate ($US per £ expressed in index number form) (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.9.

P = Implicit NNP Deflator for the UK (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.9.

P^* = Implicit NNP Deflator for the USA (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.8.

RER = Real Exchange Rate for the UK (1913 = 100). Calculated as $ER.(P/P^*)$.

Y = Real Net National Product (NNP) for the UK (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.9.

Y^* = Real NNP for the USA (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.8.

Graph 6 : Unit Labour Costs in Britain and America

W = Average weekly wage rate in the UK (1913 = 100). Source: Feinstein (1972) Table 65.

P = Implicit NNP Deflator for the UK (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.9.

W/P = Real Product Wage in the UK (1913 = 100).

Y = Real NNP for the UK (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.9.

E = Employment (civilian and armed forces) for the UK (1913 =100). Source: Feinstein (1972) Table 57.

Y/E = Index of labour productivity in the UK (1913 = 100).

ULC = Unit labour costs in the UK (1913 = 100). Calculated as $(W/P)/(Y/E)$.

W^* = Average weekly wage rate in the USA, all industries (1913 = 100). Source: Douglas (1966) Table 76.

P^* = Implicit NNP Deflator for the USA (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.8.

W^*/P^* = Real NNP for the USA (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.8.

Y^* = Real NNP for the USA (1913 = 100). Source: Friedman and Schwartz (1982) Table 4.8.

E^* = Employment (civilian and military) for the USA (1913 = 100). Source: Kendrick (1961) Table A-VI.

Y^*/E^* = Index of labour productivity in the UK (1913 = 100).

ULC^* = Unit labour costs in the USA (1913 = 100). Calculated as $(W^*/P^*)/(Y^*/E^*)$.

Graph 7 : Competitiveness

Z_1, Z_2, Z_3, Z_4 calculated as described in the text.

ULC = α ULC where α is an adjustment factor obtained as the reciprocal of the index of hours worked from Dowie (1975) Table 4 and 6.

ULC^* = β ULC^* where β is an adjustment factor obtained as the reciprocal of the index of hours worked from Douglas (1966) Table 75.

Graph 8 : The Pig-Iron Industry

SP = Selling price of pig-iron in Cleveland (1913 = 100). Source: Jones (1933), Appendix IIIA, Table 1.

SP^* = Selling price of pig-iron in the USA (1913 = 100). Source: Jones (1933), Appendix V, Table 1.

e = Sterling-dollar exchange rate index ($US per £ in index number form) (1913 = 100). Source: Friedman and Schwartz (1982), Table 4.9.

SP^*/e = Index of selling price of American pig-iron expressed in pounds sterling (1913 = 100).
TFP = Total Factor Productivity in Cleveland pig-iron industry (1913 = 100). Calculated from cost data in Graph 9, using method described in the text.
TFP^* = Total Factor Productivity in American pig-iron industry (1913 = 100). Calculated from cost data in Graph 9.

Graph 9 : Costs in the Pig-Iron Industry

C_1 = Cost of Iron Ore in Cleveland (1913 = 100).
C_2 = Cost of Coal in Cleveland (1913 = 100).
C_3 = Hourly wage rate in Cleveland pig-iron industry . (1913 = 100).
C_4 = Other costs, measured by the general price level (1913 = 100).

All the above costs in the Cleveland pig-iron industry taken from Jones (1933), Appendix IIIA, Table II.

$C_{1\star}^*$ = Cost of Iron Ore in USA (1913 = 100).
$C_{2\star}^*$ = Cost of Coke in USA (1913 = 100).
$C_{3\star}^*$ = Hourly wage rate of US blast furnace men (1913 = 100).
C_4^* = General price level (1913 = 100).

All the above costs in the American pig-iron industry from Jones (1933), Appendix V, Table 1.

Graph 10 : The Cotton Industry

SP = Selling Price of Cotton Cloth in Lancashire (1913 = 100). Source: Jones (1933), Appendix II, Table 1.
SP^* = Selling Price Cotton Cloth in the USA (1913 = 100). Source: O'Mahony (1987).
TFP = Total factor productivity in Lancashire cotton industry (1913 = 100).
TFP^* = Total factor productivity in US cotton industry. (1913 = 100).

TFP and TFP^* calculated from cost data in Graph 11.

Graph 11 : Costs in the Cotton Industry

C_1 = Cost of raw cotton in Lancashire.
C_2 = Weekly wages in the Lancashire cotton industry.
C_{2A} = Hourly wages in the Lancashire cotton industry.
C_3 = Other costs in the Lancashire cotton industry.

All the above series from Jones (1933), Appendix II, Table 1, all based on 1913 = 100. C_{2A} was adjusted to allow for the reduction in the working week in 1919.

$C_{1\star}^*$ = Cost of raw cotton in USA.
$C_{2\star}^*$ = Hourly wage rate in US cotton industry.
C_3^* = Other costs in the US cotton industry.

All the above costs in the US cotton industry from O'Mahony (1987).

NOTES

1/ Broadberry (1986a) provides a convenient survey.

2/ This is particularly clear in the counterfactual dialogue with William Kennedy in Chapter 6 of McClosky (1981).

3/ Since British shipowners bough largely from British shipbuilders.

4/ Evidence on structural change is given by Matthews et al (1982) while evidence on labour intensity is given by Von Tunzelmann (1982).

5/ Howson (1975) p.24.

6/ Howson (1975) p.47-54.

7/ Howson (1975) Chapter 3.

8/ Broadberry (1986b) p.120-121. The importance of a rising real exchange rate during this period was first stressed by Andrews (1982).

9/ Maizels (1965) gives UK and US shares of world trade in manufactures as 30.2 and 13.0% respectively in 1913. These shares had changed to 23.0 and 21.0% respectively by 1929.

10/ With the exception of Andrews (1982).

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