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### **The Business Cycle in Nineteenth Century Britain**

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## **The Business Cycle in Nineteenth Century Britain**

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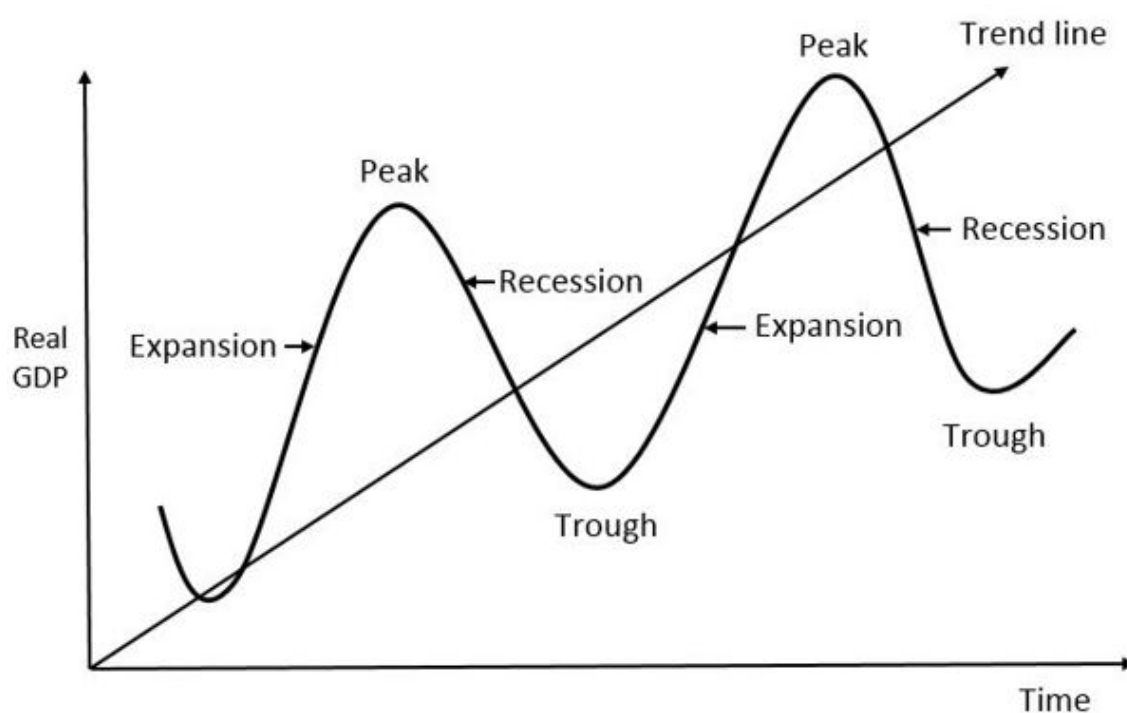
### **Abstract**

This paper explores the concept of the Business Cycle and investigates its operation within the context of the nineteenth century British economy. It begins by outlining several leading theories of the Business Cycle, in particular explanations for the existence of economic cycles in terms of the behaviour of money and bank credit; Austrian capital theory; technical change; psychological perspectives; and Multiplier-Accelerator theory. Surveying data for key economic variables in the nineteenth century leads to the conclusion that there was a Business Cycle operating during this period, with minor cycles averaging nearly six years from peak to peak and major cycles averaging nine years – corresponding to the periodicity of the Juglar Cycle. These cycles are attributed to fluctuations in aggregate demand, and the contribution of variations in export demand, investment spending, and the state of harvests is assessed. This raises the question of what caused fluctuations in these variables? The role of monetary policy and interest rates is considered, it being concluded that monetary variables were more dependent than autonomous, and that the link between interest rates and investment spending was weak. It is argued that the actual Business Cycles of the nineteenth century were due to the interaction of three factors: first, variations in British exports, especially to the Americas, which meant that as the century proceeded the British Business Cycle was more and more a product of a global Business Cycle; second fluctuations in investment spending – though this was generally a dependent factor, responding to wider growth in demand within the economy and in export demand in particular (as predicted by Accelerator theory); third, monetary and interest rate policy, which, while not initiating the cycle did exacerbate it, with rising interest rates at the peak of the boom helping to precipitate the downturn, and cheap money at the trough of the cycle helping to facilitate recovery. In short, the British

Business Cycle of the nineteenth century is held to be largely a direct product of fluctuations in export demand, the effect of which was then amplified by resulting variations in investment spending, with some further effects traceable to the operation of Bank of England monetary policy in support of the Gold Standard.

## What is the Business Cycle?

The concept of the business cycle arises from the fact that economic growth does not occur at a steady rate, but rather fluctuates around a trend, with periods of fast growth tending to be followed by slower growth or even absolute regression, before a new phase of faster growth begins. Technically, we can say that a Business Cycle refers to a fluctuation of output relative to productive potential. In a boom actual output rises towards potential output. A cyclical depression is when output is low relative to potential – i.e. a year when there is a more than average amount of idle or underutilised productive resources.



**Figure One. The Business Cycle in the context of a growing economy**

In the above graph, real GDP rises towards a peak and then falls back to a trough, before rising again. However, a recession does not necessarily involve an absolute fall in output.

Since the economy will generally have a long-term growth trend, then a cyclical upswing can be characterised as a period in which the year on year rate of growth is above the trend, and a downswing is when growth is below trend. Matthews, Feinstein and Odling-Smee define a cyclical upswing (downswing) as consisting of those years in which the year on year rate of growth of GDP was above (below) trend. A cyclical peak (trough) is the last year of the upswing (downswing).<sup>1</sup>

The phases of business cycles have important ramifications for the entire economy. As [Arthur F. Burns](#) and [Wesley C. Mitchell](#) summarized in their 1946 book *Measuring Business Cycles*:

Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; in duration, business cycles vary from more than one year to ten or twelve years.<sup>2</sup>

Ever since modern economic growth began, the path of economic growth has been punctuated by fluctuations in income and employment. What causes us to designate these fluctuations a *cycle* is the fact that they recur according to a regular pattern, that they exhibit recurring features, and that there is a strong supposition that such regularity must have some persistent underlying cause.<sup>3</sup> Several different types of Business Cycle have been identified. Following Schumpeter's analysis, these are typically designated as:

1. Kondratieff cycles – long waves of about 40 years
2. Juglar cycles – of between 7 and 11 years
3. Kitchin (Inventory) cycles – of 3-4 years<sup>4</sup>

Here we focus on the standard Juglar cycle, first formally identified by the French economist Clement Juglar in 1860. Three questions are considered:

1. Why are there such cycles?
2. What cycles characterised the British economy 1815-1914?
3. What does the British experience tell us about the causes of cycles as such?

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<sup>1</sup> R.C.O. Matthews, C.H. Feinstein, and J.C. Odling-Smee, *British Economic Growth 1856-1973* (1982), p. 294.

<sup>2</sup> A. Burns and W. Mitchell, *Measuring Business Cycles* (1946), p. 3.

<sup>3</sup> C.f. W. Beveridge, *Full Employment in a Free Society* (1944), pp. 285-86.

<sup>4</sup> J.A. Schumpeter, *Business Cycles* (1939), Vol. I., p. 169.

## Why are there Economic Cycles?

‘There is’, says R.C.O. Matthews, ‘general agreement that cyclical fluctuations in national income are caused by changes in the level of aggregate demand.’<sup>1</sup> The movement in prices and output reflects what we would expect from fluctuations in demand. If it were fluctuations in supply driving the cycle then we would expect price and output to move in opposite directions – i.e. a boom driven by increasing supply would see increasing output and falling prices, whereas we actually see both rising. This suggests that the cycle is driven by fluctuations in ‘the total *demand* for all products expressed in terms of money’.<sup>2</sup>

The question is: what causes these fluctuations in demand? There is fairly wide agreement that demand fluctuations are primarily due to investment fluctuations. But this is not always so: consumer demand can fluctuate, as, of course, can export demand.

There are numerous theories. Here we sketch just a few of the leading ones.

1. Monetary theories.
2. Austrian capital theory
3. Technical change theory
4. Psychological theory
5. Multiplier-Accelerator theory

### Monetary and Credit Theories

Monetary theories of the business cycle differ significantly in detail, but all concur that fluctuations in economic activity as a whole tend to be, not endogenous to the economy as such, but rather a result of actions of the monetary authorities with respect to the quantity of money in the economy. It is fluctuations in the supply of money that account for booms or slumps – the implication being that, if the supply of money could be stabilised or kept ‘neutral’ *vis-à-vis* the real economy, then business cycles as such would not happen. Here we briefly consider three well-known variants of the monetary theory of cycles: those of Hawtrey, Fisher, and Friedman

#### *Hawtrey’s Credit Expansion Theory*

R.G. Hawtrey was a pioneer in the study of the Business Cycle, his first book on the subject, *Good and Bad Trade*, appearing in 1913. According to Hawtrey, the trade cycle is a ‘purely monetary phenomenon’ in sense that changes in the flow of money are the sole and sufficient causes of changes in economic activity. When money demand for goods grows, trade is brisk and prices rise. When demand slackens, production shrinks and prices sag. The cycle, then, is caused by the regular rise and fall of consumer outlay. By consumer outlay he means (somewhat confusingly) not only consumer spending on goods and services, but consumer outlay on saving – which he assumed would lead to investment

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<sup>1</sup> R.C.O. Matthews, *The Trade Cycle* (1959), p. 3.

<sup>2</sup> R.G. Hawtrey, *Trade and Credit* (1928), p. 83.

spending by firms. Changes in consumer outlays are principally due to changes in the quantity of credit money. If the quantity of money diminishes demand falls, firms have unsold stocks, production will fall, unemployment rises, and wages and other incomes fall. A rise in the quantity of money will have the opposite effect. By money supply Hawtrey basically meant bank credit – that is, the loans advanced by banks to firms. Legal tender money is only a small part of this total money supply. It is the banking system that creates and regulates credit. The means of regulation are the discount rate (interest rate on lending) and the open market purchases and sales of securities.

According to Hawtrey, the upswing is caused by expansion of credit and continues as long as expansion of credit continues.<sup>1</sup> The expansion in credit occurs when banks ease the terms upon which they will lend money – above all, by a lowering of the rate of interest. How does a fall in the rate of interest (which is often quite small) lead to an increase in credit? The key link in the chain is provided by the merchant or trader. While a small change in interest rates will have little effect upon producers, merchants, who fund their purchases through borrowing, will be significantly more sensitive to variations in interest rates. Hence, if interest rates fall merchants increase their stocks, leading to increased demand from producers. Producers expand output and employment, raising consumer incomes. Consumers buy more and merchant stocks decline, causing a further increase in demand to firms and so further expansion. An expansionary cycle is set up fuelled by expansion of credit.<sup>2</sup>

At first increasing output will be in real terms, but as industries start to approach full capacity prices start to increase. The rise in prices raises the value of stocks, further encouraging traders to borrow and banks to lend to traders and firms. Inflation causes real interest rates to fall, further encouraging traders and firms to borrow, while the velocity of circulation of money increases as firms and merchants run down money balances inherited from last recession. Money demand increases again. Thus, expansion is a cumulative process and once started continues on its own momentum as long as credit grows to fuel it. However, the central bank (Bank of England) in the nineteenth century could not allow this to happen. This was because of Britain's attachment to the gold standard. As trade and lending grow and prices rise, gold will start to flow out of the economy through a developing balance of payments deficit and out of banks as customers draw down money balances. If this were to carry on, Britain would not be able to remain on the gold standard as it would lack the gold reserves to sustain the system. Hence, the Bank of England was forced to stop the credit expansion by raising interest rates. A rise in interest rates pushes the economy into recession. With margins narrowing due to increased borrowing costs, merchants cut back their demand for new output to replenish stocks. Firms experience a fall in demand and cut back production. Consumer incomes fall and so does demand. Stocks rise again, causing merchants to cut orders. Firms, merchants, and consumers increase their holdings of cash, causing the velocity of circulation to fall. Prices decline,

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<sup>1</sup> G. Haberler, *Prosperity and Depression* (1946), p. 17.

<sup>2</sup> *Ibid.*, p. 19.



further cutting the profits on trade, leading to additional falls in orders from firms. The amount of credit in the economy contracts as borrowing declines. The result is a depression.

During a depression cash returns to banks. Reserve ratios are restored. Interest rates are low. This will usually cause some firms to borrow again and recommence expansion. However, if business pessimism means that no one is willing to borrow, the Bank can begin purchasing securities in the open market. This pushes cash into the banks, raising their liquidity. At first banks may just allow the cash to rise as loans are paid off – but eventually the cash in the economy will begin to spark increased spending and borrowing.<sup>1</sup>

So, for Hawtrey, the basic cause of the cycle is the over-expansion and then over-contraction of credit. This follows a rhythmic pattern since a recovery takes time to develop into an inflationary boom. At first the growth of credit accompanies the real growth of the economy. Prices are stable and the balance of payments will not notably deteriorate. It is only as the economy approaches full capacity and inflation begins that gold begins to drain from the banking system and the central bank has to intervene to curb the inflationary spiral by stopping the growth of credit. Thus, the business cycle is a result of the combination of the expansionary tendency of credit and the need to uphold the gold standard. Hence, summarises Macfie, ‘The trade cycle is due to the fact that the central banks do not impose checks on lending in time. If they did, the cycle would disappear.’<sup>2</sup>

#### *Fisher’s Real Interest and Debt Deflation Theory*

An active proponent of the Quantity Theory of Money, according to which  $MV=PT$ , Irving Fisher believed that in the **long-run** changes in the supply of money (M) only affect the price level (P). However, he argued that in the **short-run** changes in the money supply could have wider effects on the economy. For example, if the money supply rises and prices start to rise, then real interest rates will probably fall if the rates of interest charged on loans do not immediately adjust to the higher inflation rate. This is because of the existence of **Money Illusion**. While the nominal interest rate charged on a loan (i) may be 6%, if the rate of inflation ( $\pi$ ) is 3%, then the real rate of interest charged on the loan is  $i-\pi = r$ , or  $6\%-3\%=3\%$ . In which case, firms will want to borrow more for investment projects and economic activity will increase, which might in turn lead to a rise in the Velocity of Circulation of money (V) and the level of real output (T). Hence, an increase in M might lead to increases in P, V, and T in the short-run. But these effects will not continue in the long run. This is because with the demand for loans exceeding the supply of loans at the artificially lowered rate of interest, interest rates will rise until they are restored to their original equilibrium level in real terms. This will in turn cause firms to cut back on investment and the economy will contract in real terms to its previous full employment equilibrium. With V and T returning to their initial levels, the change in M

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<sup>1</sup> *Ibid.*, p. 22.

<sup>2</sup> A.L. Macfie, *Theories of the Trade Cycle* (1934), p. 35.

has led only to a change in  $P$ . *The transitory effects on output of changes in the money supply led Fisher to see this process as the cause of the trade cycle.* Periods of growing money supply led to booms in which the economy overheated with excess demand and price rises, which in turn lowered the real rate of interest, leading to excessive borrowing. Once these booms broke then monetary demand would fall leading to unemployment, falling prices, rising real interest rates and a rise in the real value of debts. This, he contended in a 1933 essay 'Debt-Deflation Theory of Great Depressions', was the cause of the Great Depression of 1929.

### *Friedman's Monetary Theory*

In support of his re-statement of the Quantity Theory of Money, Milton Friedman surveyed the monetary history of the United States (and later Britain). Like Fisher, Friedman believed that business cycles were a product of fluctuations in the money supply. An economy would naturally tend to full employment equilibrium, with any observable unemployment then existing being labelled the Natural Rate of Unemployment. However, an increase in the rate of monetary growth beyond the growth rate of the real economy could generate a short-term boom. With the growth in the supply of money people would be holding greater money balances than they anticipated. They respond by purchasing a range of assets, from stocks and shares to consumer goods. Hence money demand in the economy rises, and with it prices. At first wages don't rise as the inflation is unanticipated and with falling real wages firms expand output and employment and the economy grows in real terms. This is the boom process and unemployment falls below the Natural Rate. But this is a short-term effect due to money illusion. With the labour market tightening and workers realising that their real wages have fallen due to inflation, money wages start to rise relative to prices, and so real wages increase. The result now is a recession, as firms cut back employment and output and the economy returns to the initial equilibrium position and unemployment rises back to the level of the Natural Rate. Similarly, if the money supply initially contracts then demand and prices will fall. With money wages initially sticky, real wages rise and firms will cut back output and employment. There is a recession and unemployment rises above the Natural Rate. Yet again this is only temporary: as money wages begin to fall, so do real wages and employment and output will increase until the economy returns to its underlying full-employment equilibrium. Thus, it is fluctuations in the money supply of money overseen by the monetary authorities that lead to short-term fluctuations in the level of real output – and this is the cause of the business cycle. Most famously, Friedman attributed the Great Depression of 1929-33 to a fall in the money supply of the United States which began in 1928 and led, by 1933, to a one-third fall in the money supply. Business cycles were thus a monetary phenomenon.

### **Austrian Capital Theory**



Like Hawtrey's credit theory of business cycles, the Austrian theory highlights the importance of bank lending. However the mechanism posited for generating the cycle is different: according to the Austrian school, credit expansion leads to falling interest rates which in turn induce an unsustainable growth in investment, and it is the collapse of this investment that brings about the depression.

The most complete Austrian account of the Business Cycle was provided by Hayek in his 1931 *Prices and Production*. According to Hayek, the key factor explaining the cycle is the relationship between the Real and the Money Rate of interest. The **Real Rate of Interest** is determined by the saving and investment decisions of individuals and it acts to bring savings and investment into equilibrium. If firms want to borrow more funds from savers to finance investment then demand will exceed supply and the interest rate will rise, encouraging more saving and choking back some investment until the demand and supply of loanable funds are brought back into equality. The **Money Rate** is the interest rate at which firms can borrow money from the bank. If the money rate is below the real rate then it will be worth firms borrowing money to invest as the real rate of return (rate of profit) on their investment will exceed the money cost of the loan used to finance it. The business cycle is precipitated by such a situation as it means that excessive investment will occur and this leads to the subsequent crisis. Two things can cause the real rate of interest to be above the money rate:

1. A lowering of money rates by banks, monetary authorities etc.
2. An increase in the real rate of interest due to improvements in business profits – e.g. due to technical change, falling input prices, good harvests etc.

The first set of reasons are exogenous (i.e. they are due to behaviour determined outside the system), but *the second are inevitable under capitalism and mean that capitalist economies will tend towards business cycles*.

Let us see how this works. Imagine that there are two sectors in the economy: a **capital or producer goods sector** which makes machines, factory buildings, processed raw materials, tools etc., and a **consumer goods sector** that makes finished products for immediate consumption. At first the two are in equilibrium: both sectors sell the amount of output they want to make and the amount people want to save equals the amount people want to invest. Now imagine that the opening up of a new export market raises firms expected profits. The expected real rate of return on investment will increase, and hence so will the real rate of interest, since interest rates will have to rise to bring saving and investment into line at the new higher level of investment. *However, this does not immediately happen as at first firms go to the banks to borrow more money at the existing lower money rate of interest.* These banks will supply these firms with credit because they will see a way to increase their profits and they will fear that if they charge higher money rates of interest borrowers will simply switch demand to other banks. The flexible credit system means that the demand for investment funds can be accommodated. Note that the bankers' role is a passive one: they merely respond to the increased demand for loans from producers.

Thus, entrepreneurs with more optimistic profit expectations seek to borrow money from banks to fund their expansion, and the result is an expansion of investment in the making of producer goods as these firms order machines, tools, buildings and so forth. However, this expansion in producer goods manufacture will not be sustainable. This is because Hayek assumes that the economy starts from a position of full employment. *This means the growth in the capital goods sector can only occur if resources are shifted away from the making of consumer goods.* Flush with bank credits, the makers of capital goods are at first able to outbid makers of consumer goods to obtain resources by paying higher prices for them. But while this might happen in the short term, it will not happen in the long term. The reason is that saving and consumption decisions have not changed. The people who receive income from the manufacture of producer and consumer goods have not decided to save more and consume less. Hence in their spending they will try to devote the same share of income to consumption as before. Firms making consumer goods will experience an increase in demand (there is more money demand in the system), while the output of consumer goods will have been squeezed as resources like labour are drawn into making producer goods. ‘A scarcity of consumers’ goods will make itself felt and the prices of those goods will rise.’ As the prices of consumer goods rise, consumer goods makers will now be able to bid resources back to the consumer goods sector, leaving the producer goods sector over expanded. Some non-specific resources like unskilled labour, energy, empty factory buildings can be easily transferred from the producer to the consumer goods sector, but specific factors of production like machines, tools, and certain types of skilled labour cannot simply be transferred to the consumer goods sector and will be left high and dry when the producer boom recedes. Hayek expressed the situation as follows:

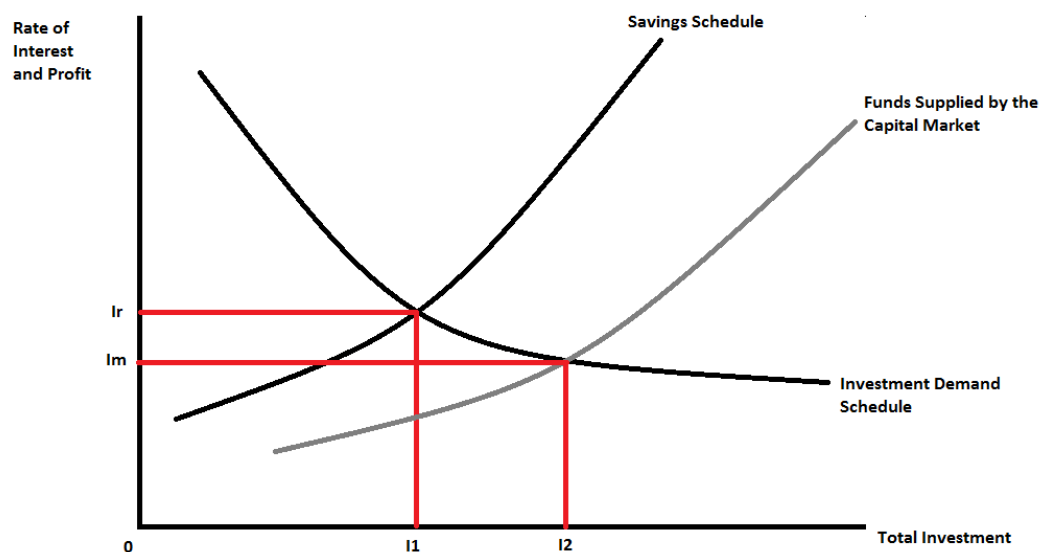
The situation would be similar to that of a people of an isolated island, if, after having partially constructed an enormous machine which was to provide them all with necessities, they found out that they had exhausted all their savings and available free capital before the new machine could turn out its product. They would then have no choice but to abandon temporarily the work on the new process and to devote all their labour to producing their daily food without any capital.<sup>1</sup>

This shift back from producer to consumer goods will only be avoided if there is ‘a further proportional injection of bank money by new bank loans granted to producers’, the effect of which will be to again push money rates of interest below the real rate – as shown in the below diagram.<sup>2</sup>

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<sup>1</sup> F.A. Hayek, *Prices and Production* (1935 edn.), p. 94.

<sup>2</sup> E.C. Bratt, *Business Cycles and Forecasting* (1961), p. 160.



**Figure Two. Austrian Capital Theory**

In Figure Two, the equilibrium real rate of interest is  $I_r$ , where the supply of savings equals the demand for Investment,  $I_1$ . However, by expanding money credit the banking sector lowers the money rate of interest to  $I_m$ , and firms respond to increasing investment to  $I_2$ . But  $I_2$  investment cannot be sustained as rising incomes cause consumption demand to increase and resources will be bid-back to the consumption goods sector and interest rates return to the real equilibrium level  $I_r$ . But if the expansion of credit is repeated again to push interest rates down the whole process will be repeated – but now with a bigger over-expansion still in the relative size of the producer goods sector. It would also lead to a growth in the overall rate of inflation as the money supply grows, and ‘this continuous rise of prices would, after a while, make it necessary to stop this process of inflation.’ When this happens, non-specific factors of production will shift back to the consumer goods sector, but specific producer goods and resources will not be able to so move and they will be rendered unprofitable. As a result there will be ‘a fairly sudden stoppage of work in at least all the earlier stages of the longer processes.’ By this means a recession in the capital goods sector will have been generated, leaving unemployed workers, machines, and buildings, while firms will be driven out of business. This depression is necessary to cut back the over-expansion of the capital goods sector and restore the initial equilibrium between the capital and consumers goods sectors of the economy. The business cycle is inevitable under capitalism as entrepreneurs will periodically calculate expected rates of return to be higher than the money rate of interest. However, central bankers can exacerbate or initiate a cycle by expanding credit and pushing money interest rates below the natural rate. So, while a business cycle of some kind is inevitable under capitalism as

businesses will periodically see the chance to increase profits by borrowing and investing, it will only become pronounced if the monetary authorities supply the credit to sustain it. Thus, in reality, the cause of booms and recessions is over-extension of investment due to excessive supply of credit pushing interest rates below the level balancing investment and saving in real terms. The boom is characterised by disproportionality between capital and consumer goods sectors and this is unsustainable.

### Technical Progress

In his *Business Cycles* (1939) Joseph Schumpeter argued that what underlay the cyclical pattern of growth under capitalism was the tendency for innovations to occur in clusters or ‘swarms’.<sup>1</sup> Invention, the process of developing new techniques, occurs continually. But inventions are not automatically introduced into the production process. At first firms are reluctant to depart from existing yet remunerative methods, not wishing to disturb the *status quo*, so the stock of unexploited inventions accumulates. Then one entrepreneur with drive and imagination grasps the potential of a new technique and innovates, introducing it to the production process. Being the first to do so he will make a **Super Normal Profit** as his costs fall or he opens up some new attractive product. Other firms now see the profitable potential of the new technique and follow suit. There is a surge of innovation as a result, with the backlog of new inventions now being utilised for the first time. Investment and employment increase, and bank lending will rise as entrepreneurs borrow to fund the innovation process, further stimulating the economy. A boom results – but it will not last. While the stock of unused inventions depletes, more and more firms are using the new techniques and products, with the result that output increases and prices fall. The Super Normal Profits dry up and firms stop investing in new plant and products. Growth stalls, and as firms are no longer expanding they stop borrowing and even pay back their loans. The supply of credit contracts and firms across the economy experience falling demand, causing them to cut back output. A recession is now underway and will only be replaced with renewed growth when some new entrepreneurs are responsible for another cluster of profitable innovations. A distinctive feature of this theory is that it is based on real features of the economy – inventions, innovations, products, entrepreneurs – and not, as in most trade cycle theories, the role of money. Fluctuations in bank lending play a part in the theory – but a secondary one, being dependent on variations in innovative behaviour.

### Psychological Theory

Psychological theories of the cycle emphasise, not so much current prices, costs, and money demand, but *expectations* regarding the future value of these variables. And of course, as Haberler observes, with ‘the introduction of the element of expectation, uncertainty enters the field. Future events cannot be forecast with absolute precision; and the farther they are distant in the future, the greater the uncertainty, and the greater the

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<sup>1</sup> Schumpeter, *Business Cycles*, Vol. I., Chs III and IV.

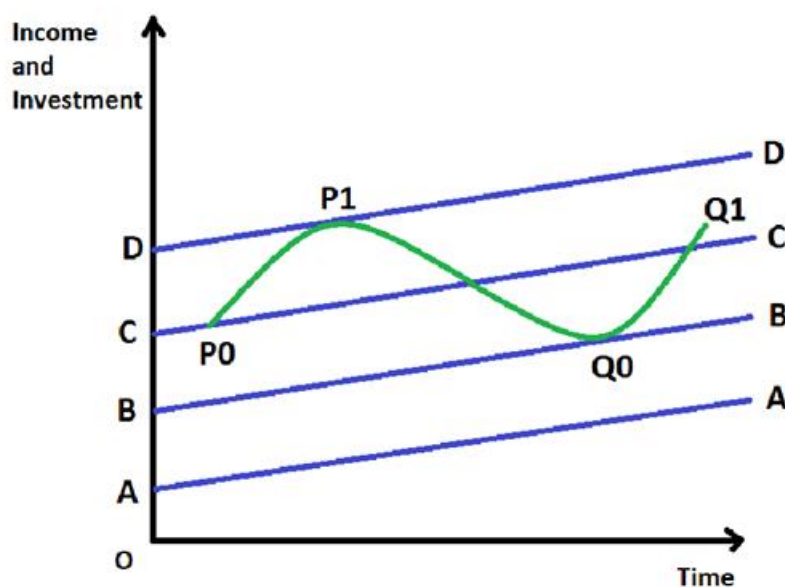
possibility of unforeseen and unforeseeable disturbances.’ In this situation, decision takers must predict – and the future predicted will be shaped, not only by extrapolating from observable trends, but by matters of psychological disposition: what Keynes called ‘animal spirits’. If businessmen are optimistic about future profitable opportunities then they will invest more; if they are pessimistic then they will invest less. And these decisions will help to bring about the very thing that is predicted. For if businessmen expect growing future prosperity they may invest more in capital plant, further boosting the economy and helping to vindicate optimism. If they invest less then the economy may contract, again vindicating the initial expectation. The point here is that psychological attitudes reinforce one another and are able to either generate or exacerbate cyclical tendencies. For example, if business prospects in some sectors decline (e.g. due to a harvest failure) then this deterioration in conditions can lead to firms in other sectors taking more pessimistic views as to future trading conditions – leading them to cut back investment plans – and thus the downturn is generalised, leading to a further downward revision of expected profits and a still more intense slump. The opposite may occur if there are signs of a business revival. What is happening here is that the psychology of investors causes them to make decisions to expand or contract spending beyond what a simple survey of the business data would justify. Hence Pigou spoke of ‘variations in the tone of mind of persons whose action controls industry, emerging in errors of undue optimism or undue pessimism in their business forecasts.’<sup>1</sup> The classic manifestation of this is the stock market boom, where assets are purchased on the assumption of future rises in value – with the result that they become overpriced in relation to future yields, and when the bull market breaks the collapse in stock values brings capital losses, a reduction in spending, and a shift to pessimism that can carry an economy into depression.

### **Multiplier-Accelerator Theory**

The Keynesian Revolution of the 1930s led to the development of new insights into the business cycle. The basic thrust of Keynes’s work was to emphasise how variations in expenditure generate exaggerated variations in output through the multiplier process, and to this Samuelson added the concept of the Accelerator, whereby a change in income in turn can generate exaggerated variations in investment. In 1950 John Hicks combined these two concepts in his *A Contribution to the Theory of the Trade Cycle*, according to which the driver of the trade cycle was fluctuations in investment, and what converted these fluctuations into a regular cycle was ‘the effect of changes in output (or income) on investment.’ Hicks began with an economy growing at a constant rate, with the total maximum output of the economy growing also. This steady growth in actual output is represented by the CC line in **Figure Three**.

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<sup>1</sup> A.C. Pigou, *Industrial Fluctuations* (1927), p. 66.



**Figure Three. Hicks's Trade Cycle Model**

However, the economy is not actually operating at its maximum output, but at some output less than that. The growth in total capacity is shown by the line DD. There are two types of Investment:

1. **Autonomous Investment.** This is investment that is not determined by changes in output – it includes government investment and investment in some new technology. Hicks assumes that Autonomous Investment, represented by the line AA, increases by a steady amount each year. He assumes this because he is seeking to model the business cycle in the context of a growing economy.
2. **Induced Investment.** This is brought forth by *changes* in output.

Now suppose, at point P0, Autonomous Investment increases to BB – say because there is some new technology that is profitable to deploy. As in the Keynesian analysis, a rise in Investment causes national income to rise *via* the **Multiplier**. The rate of economic growth increases and the economy begins to move towards its maximum ceiling. In itself, this fluctuation would soon die down as Autonomous Investment falls back and the Multiplier would begin to diminish in its effect. However, the rise in output triggers a surge in **Induced Investment** as firms invest in extra fixed capital to meet the new higher level of demand. This is the **Accelerator Effect**. The Accelerator Theory states that the level of Induced Investment depends on the rate of change of National Income (Y). In other words,  $I_i = \alpha \Delta Y$ , where  $I_i$  is the level of induced Investment,  $\alpha$  is the Accelerator Coefficient, and  $\Delta Y$  is the change in National Income. To increase output by a certain amount, an investment in fixed capital greater than this will be required. For example, to increase output by £1m in the next year firms might need to invest in machinery costing £10m – so the **Accelerator Coefficient** ( $\alpha$ ) is  $\text{£}10\text{m}/\text{£}1\text{m} = 10$ . The economy now grows



rapidly, and as demand grows, further increases in Induced Investment are triggered. This continues until the economy begins to approach full employment at P1. With no surplus resources the economy can, at best, grow along its initial equilibrium growth path. But this it cannot do. For once the expansionary boom in output ends, output growth slows considerably – and this means that Induced Investment will fall even more rapidly due to the Accelerator. With falling induced investment, output begins to contract and the economy tends towards a recession. Output continues to fall until it reaches its lowest point in the slump, at Q0. This decline will not continue for ever – for two reasons:

1. Falls in income do not generate a multiplied fall in investment in the same way that rises in income generate an accelerated increase in induced investment. Once output is falling, Induced Investment falls and becomes negative. It does not, however, become negative to the degree one might expect given the Accelerator Coefficient. This is because firms do not liquidate large amounts of fixed capital – rather they let their existing capital stock depreciate and go more slowly out of operation. So, while Induced Investment is now negative, it is so only to a limited and fixed degree.
2. Autonomous Investment, which is unrelated to income, continues at its previous long-term rate of growth. As Autonomous Investment continues, so does it have a multiplied impact on total income due to the Multiplier – and as output increases so will the Accelerator impact on Induced Investment kick off again and the economy will enter a recovery phase that will again take it towards full employment and so on.

Thus, the economy will swing between booms and slumps over a regular cycle, but with a steady upward trend in Autonomous Investment and with the effects of the expansion of Induced Investment in the upswing not being counterbalanced by contractions in the capital stock in the down swing, the total capital stock rises over time and the economy grows in the long run.

## British Business Cycles 1815-1914

So much for the contrasting theories of business cycles. Let us now look at the experience of cycles in the nineteenth century British economy.

While historians disagree as to the causes of cycles, there is a broad consensus regarding the dating of cyclical movements over the nineteenth century. The following table outlines the cycle turning points as identified by a revised index for industrial production generated by Crafts, Leybourne, and Mills in 1987.<sup>1</sup>

Peak	Trough	Peak to Peak	Peak	Trough	Peak to Peak
1815	1816		1860	1861	3
1818	1819	3	1866	1869	6
1825	1826	7	1874	1879	8
1828	1829	3	1883	1886	9
1831	1832	3	1891	1893	8
1836	1837	5	1899	1904	8
1839	1842	3	1907	1908	8
1845	1847	6	1913		6
1854	1855	9			
1857	1858	3			

**Table I. Cyclical Turning Points in Industrial Production 1815-1913**

Taking all the observed cycles together, the average duration from peak to peak was 5.7 years. However, Rostow notes that if the major cycles are considered separately, the average duration is 9 years – which conforms very closely to the periodicity of the Juglar cycle.<sup>2</sup> For Rostow, a major cycle is one characterised by, first, an approach to full employment at its peak, and second, a tendency for persons and institutions to engage in significant long-term investment at home or abroad. William Beveridge, in his 1944 survey of the trade cycle in Britain, found there to be 15 major cycles between 1792 and 1913, with an average length from peak to peak of just over eight years.<sup>3</sup> The below diagram, showing the fluctuations in UK unemployment between 1870 and 1912, exemplifies the main pattern of the Juglar business cycle.

<sup>1</sup> N.F.R. Crafts, S.J. Leybourne, and T.C. Mills, 'Trends and Cycles in British Industrial Production, 1700-1913', *Journal of the Royal Statistical Society. Series A.*, Vol. 152 No. 1 (1989), p. 58.

<sup>2</sup> W.W. Rostow, *British Economy of the Nineteenth Century* (1948), p. 38.

<sup>3</sup> W.H. Beveridge, *Full Employment in a Free Society* (1944), p. 281.



**Figure Four. UK Unemployment Rate 1870-1913<sup>1</sup>**

It is striking how the fluctuations in unemployment rates correspond with the dating of the Juglar peaks of the period as identified by Lewis: ‘the dates of the Juglar peaks are roughly: 1872/3, 1882/4, 1889/92, 1899, 1906/7 and 1912/13.’<sup>2</sup> This Juglar pattern was a basic characteristic of the British economy through the nineteenth century. To quote D.H. Aldcroft and P. Fearon:

A major cycle of 7-8 years duration can be traced back to the late eighteenth century. During the first part of the nineteenth century the major cycle was punctuated or interrupted by shorter ones of about 3-4 years duration, but these gradually fade away by the middle of the century as the standard business cycle becomes dominant. If we discount the minor interruptions in the 1920s the Juglar pattern continues without check through to 1937.<sup>3</sup>

This raises the question: what caused these periodic and regular variations in the overall level of economic activity?

As noted, the determining factor almost certainly was variations in aggregate demand. But what caused this? Most models of the business cycle would highlight the role of

<sup>1</sup> Source: <http://socialdemocracy21stcentury.blogspot.co.uk/2014/12/sauls-myth-of-great-depression-18731896.html>

<sup>2</sup> W.A. Lewis, *Growth and Fluctuations 1870-1913* (1978), p. 20.

<sup>3</sup> D.H. Aldcroft and P. Fearon, *British Economic Fluctuations 1790-1939* (1972), p. 13.

investment, and for a closed economy this makes sense in terms of the greater volatility of investment spending, its dependence upon business confidence and the impact of fluctuations in monetary policy and therefore interest rates. The other main component of spending – consumption spending – being viewed typically as a dependent variable. But the British economy was an open one, with exports accounting for around 15-20% of national income, which points to export demand being another potential cause of fluctuations in total spending and output.<sup>1</sup> Thus, Gayer, Rostow and Schwartz, in their *The Growth and Fluctuation of the British Economy 1790-1850* (1953), noted that their history of business fluctuations during the period was ‘organized on the assumption that two factors, above all others, could usefully be said to have had causal significance in British business cycles during this period: the volume of exports and the volume of domestic investment.’<sup>2</sup> According to Aldcroft and Fearon, between 1836 and 1907, around 58% of fluctuations in GNP were due to fluctuations in consumption spending. However, this reflects the fact that consumption spending accounted for 85% of all spending. The driving force in terms of fluctuations came much more, they conclude, from export demand and fixed capital investment. Although exports accounted for less than 20% of national income, they contributed 38% to income fluctuations, while investment, at 10% of national income, contributed 33%. Thus ‘exports and investment were the major elements of instability in the economic system.’<sup>3</sup> This suggests two questions: which was more important, export or investment demand? And, what was the cause of these fluctuations?

## Accounting for the Nineteenth Century Cycle

### The Role of Export Demand

Fluctuations in demand for UK exports are the most commonly cited reason for the business cycle of the nineteenth century. A host of writers have highlighted the role of export demand in initiating cycles, including Gayer, Rostow and Schwartz; W.A. Lewis; William Beveridge; A.G. Ford; R.S. Sayers; and Aldcroft and Fearon. For example, Gayer, Rostow, and Schwartz, in their exceptionally thorough account of the trade cycle between 1790 and 1850, see fluctuations in business activity as being *initiated* by variations in exports. ‘The volume of domestic goods’ exports’, they write, ‘showed a high positive correlation with general business-cycle movements. In only two years of increasing general prosperity did the series exhibit absolute decline – 1823 and 1825.’<sup>4</sup> They further note that exports increased in *every* first year of business recovery, though the rate of increase of exports generally declined as the recovery proceeded, causing them to conclude

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<sup>1</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 26.

<sup>2</sup> A.D. Gayer, W.W. Rostow and A. Schwartz, *The Growth and Fluctuation of the British Economy 1790-1850* (1953), II., p. 532.

<sup>3</sup> Aldcroft and Fearon, *British Economic Fluctuations*, pp. 30-32.

<sup>4</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II., pp. 532-33.

for the period 1790-1850 that 'increased exports were an essential initiating factor in revival...'<sup>1</sup> Indeed, given the preponderance of textile exports in British exports, (as late as the 1840s textile exports accounted for 63% of British goods' exports in value), these export cycles were in large measure the result of fluctuations in demand for British textiles. These are the 'minor cycles' that become 'major' cycles when variations in investment develop out of them. The most trenchant advocate of the export-theory of the cycle is A.G. Ford, who argued for the primacy of export demand in his 1963 'Notes on the Role of Exports in British Economic Fluctuations, 1870-1914', and reiterated this theme in his 1969 'British Economic Fluctuations, 1870-1914' and again in his 1981 'The Trade Cycle in Britain 1860-1914'.<sup>2</sup> In the former, Ford wrote that:

a survey of British exports, net home investment, net national income, and trade union unemployment, 'makes it abundantly clear that the *proximate* cause of fluctuations in British money incomes was fluctuations in merchandise export values, aided or impeded by fluctuations in home investment.'<sup>3</sup>

In his 1969 study Ford similarly contended that: 'This study has placed prime emphasis for the proximate causes in UK money incomes on fluctuations in export values, aided (or at times impeded) by fluctuations in home investment as a junior partner.'<sup>4</sup>

What evidence supports this proposition?

1. The British economy of the nineteenth century was a strikingly open one: export demand accounted for around 20% of national income. Variations in export demand were therefore likely to have a significant effect on the level of domestic economic activity.

2. Export demand was a notably variable quantity. Ford calculates that between 1870 and 1914, the absolute fluctuations in export values were consistently 2 to 2.5 times as great as that of home investment.<sup>5</sup> With reference to the years 1864-1913, Aldcroft and Richardson estimate that the average percentage variation in the volume of exports, from trough to peak over the business cycle, was 35%, whereas the average percentage variation in real national income was 21%.<sup>6</sup>

3. Beveridge, surveying the entire period 1785 to 1913, found that the variation in output of the textile trades was in every period greater than the variation in output of all industries together. When capital goods are removed from the industry series the divergence becomes still more marked. Since textiles are a consumer good, and consumer good output tended to fluctuate less markedly than that of capital goods, 'the

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<sup>1</sup> *Ibid.*

<sup>2</sup> A.G. Ford, 'Notes on the Role of Exports in British Economic Fluctuations, 1870-1914', *Economic History Review*, Vol. 16, No. 2 (1963), pp. 328-337; A.G. Ford, 'British Economic Fluctuations 1870-1914', in Aldcroft and Fearon, *British Economic Fluctuations 1870-1939* (1972); A.G. Ford, 'The Trade Cycle in Britain 1860-1914', in R. Floud and D. McCloskey, *The Economic History of Britain Since 1700* (1981), II. pp. 27-49.

<sup>3</sup> Ford, 'Notes on the Role of Exports', p. 331.

<sup>4</sup> Ford, 'British Economic Fluctuations', p. 143.

<sup>5</sup> Ford, 'Notes on the Role of Exports', p. 332.

<sup>6</sup> D.H. Aldcroft and H.W. Richardson, *The British Economy 1870-1913* (1969), pp. 25, 30.

greater range of fluctuation in textiles up to the First World War can hardly be due to anything but their dependence on overseas demand.’<sup>1</sup>

4. If the fluctuations in exports are weighted according to the share of export demand in GNP, then Aldcroft and Fearon estimate that export fluctuations accounted for 38% of GNP fluctuations on average between 1836-1907. This made exports the chief source of income variation, since fluctuations in Fixed Capital Formation accounted for 33%.<sup>2</sup>

5. The timing of export fluctuations are closely correlated with fluctuations in national income, with export fluctuations either preceding or moving with variations in national income. To quote Aldcroft and Fearon:

As far as the synchronisation of turning points is concerned it is significant that the peaks and troughs in exports either coincided with or preceded those of income. This was true in practically every case through to 1937, the major exceptions being the income peaks of 1859 and 1865 when exports lagged by one year or less.<sup>3</sup>

For the years 1836-1909 Aldcroft and Fearon calculate that exports and GNP moved in the same direction for 54 years, and against each other for 19, yielding a similar phasing ratio of 74%. Estimates of the correlation coefficient between variations in income and export values suggest a figure of around 0.5. This was the correlation coefficient found by Beveridge when relating movements in the value of merchandise exports to variations in industrial output between 1815 and 1859, while when correlating export values with the employment rate as a measure of economic activity between 1867 and 1913 Beveridge arrived at a figure of 0.74. As he concludes: ‘In the earlier period (1815-59), as in the later period (1867-1913), there is now revealed a significant positive correlation between industrial activity and declared export values of United Kingdom produce taken simultaneously.’ ‘Reversal of an upward swing of the cycle, that is to say, the beginning of a decline, is normally, if not invariably, heralded by a drop in the volume of British exports; reversal of a downswing, that is to say, the beginning of a recovery, is heralded normally, if not invariably, by a rise in these exports.’<sup>4</sup> In his *Full Employment in a Free Society* Beveridge identified, as a key feature of the British cycle, ‘the leadership in time, into and out of depression, of those industries in Britain which are dependent largely upon exports.’<sup>5</sup> These results were corroborated by Gayer *et. al.* for the period before 1850 when, as we have seen, they found that ‘all business cycles were marked by increases in the volume of exports.’<sup>6</sup>

However, two caveats need to be entered at this stage.

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<sup>1</sup> Beveridge, *Full Employment*, p. 293.

<sup>2</sup> Aldcroft and Richardson, *British Economy*, pp. 28-29.

<sup>3</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 29.

<sup>4</sup> W. Beveridge, ‘The Trade Cycle in Britain before 1850: A Postscript’, *Oxford Economic Papers*, No 4. (1940), pp. 72, 74.

<sup>5</sup> Beveridge, *Full Employment*, p. 294.

<sup>6</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II. p. 534.



1. Exports did not generate cycles alone. Fluctuations in investment also played an important part in observed cycles, and Aldcroft and Fearon found that when real output was correlated against variations in exports and investment together the degree of correlation was notably higher, at 0.73 between 1836 and 1909 and 0.66 for the period 1870-1909. In other words, a combination of exports and investment are a better explanation of observed variations in income than either taken alone.

2. Attributing output fluctuation to export variation leaves the question: what caused the export variation to begin with? If, as is generally assumed, exports were determined exogenously by conditions in export markets, then the implication is that either the British cycle was a sub-set of a European or global cycle, or that the British cycle was not a cycle at all, but was essentially accidental. But was export demand exogenous? There are reasons to qualify this and we shall consider these below.

## Investment Demand

Most theoretical models of the business cycle prioritise investment as the causal factor. This is true of Keynesian accelerator models, Austrian theories, psychological theories and Schumpeterian explanations. Investment, especially investment in fixed capital formation, is regarded as an autonomous form of spending which determines overall business activity and a form of spending which not only fluctuates significantly, but does so in response to key economic variables such as profit expectations and interest rates. Hence variations in investment spending have also been referred to in explaining the nineteenth century cycle. Arguments in favour of this proposition include:

1. Investment spending, which accounted for up to 10% of GDP, was notably volatile, and more so than income or exports. The relative variations of gross home investment were greater than those of exports – i.e. the variation of investment from its trough to peak over the cycle (although the absolute variations of exports were larger).<sup>1</sup> Between 1857 and 1908 the average percentage fluctuation in gross domestic fixed capital formation from peak to trough over the investment cycles was 64%.<sup>2</sup> ‘The figures of fixed capital investment’, observed Alec Cairncross in 1953, ‘reveal cyclical fluctuations of considerable amplitude and are at least not inconsistent with the theory that it was investment that dominated industrial fluctuations.’<sup>3</sup>

2. There is a fairly close correlation between gross fixed capital formation and total output through the period. Between 1836 and 1909, Aldcroft and Fearon found that total fixed capital investment and GNP moved in the same direction 54 times, and in opposite directions 19 times, giving a percentage of similar phasing figure of 74% - identical of that

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<sup>1</sup> Ford, ‘Trade Cycle in Britain’, p. 35.

<sup>2</sup> Calculated from C.H. Feinstein, ‘The Compilation of Gross Fixed Capital Formation Statistics, 1856-1913’, in J.P. Higgins and S. Pollard (eds), *Aspects of Capital Investment in Great Britain 1750-1850* (1971), p. 45.

<sup>3</sup> A. K. Cairncross, *Home and Foreign Investment 1870-1913* (1953), p. 10.

between GNP and exports.<sup>1</sup> Indeed, the correlation between GNP and gross capital formation was 0.64 over the years 1836-1909, nearly twice the figure for exports.<sup>2</sup>

3. Gayer, Swartz and Rostow argue for the period 1790 to 1850 that, while variations in exports initiated the cycle, it was variations in investment that carried a short-term cycle into a Juglar 7-10 year cycle. Rapid increases in fixed capital construction, they write, 'tended to be concentrated in the latter stages of certain general business expansions.'<sup>3</sup> Indeed, Rostow defined a major cycle as one characterised, at its peak, by both relatively full employment and a willingness by persons and institutions 'to enter into long-term investment commitments, at home and/or abroad, on a large scale.'<sup>4</sup>

So, investment fluctuations were certainly a part of the story of the nineteenth century cycle – as theory would predict. Investment, together with export demand, were the two forms of autonomous spending with both the character and the behaviour to explain fluctuations in economic activity. Ford calculates that 64% of the variation in GNP between 1870 and 1914 can be attributed to variations in export and investment spending.<sup>5</sup> Aldcroft and Fearon arrive at the same figure for the 1870-1909 period, but a slightly higher one – 73% - for the years 1836-1909.<sup>6</sup> Gayer *et. al.* concluded that it was exports and investment that together explained the economic upswing, with exports increasing first and then inducing an expansion in investment.

The generalized picture of expansion which emerges [for the years 1790-1850] is of recovery begun by an increase in exports and, after a period, supplemented by large-scale domestic investment. It is probable, further, that these two sources of new orders to industry were related. The primary and secondary (multiplier) effects on total income, due to the increase in exports in the early stages of revival, helped to induce and to finance the later construction of capital equipment.<sup>7</sup>

Even so, it needs to be understood that fixed capital was not so large an element in the economy as one is inclined to imagine. In 1875, for example, the railways of Britain accounted for more fixed capital in value than all of manufacturing industry. Working capital (stocks and work in progress) was a much more important component of total capital than was machinery and plant.<sup>8</sup> Second, this still leave the question of what *caused* the fluctuations in exports and investment.

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<sup>1</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 30.

<sup>2</sup> *Ibid.*, p. 31.

<sup>3</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II. p. 534.

<sup>4</sup> Rostow, *British Economy of the Nineteenth Century*, p. 36.

<sup>5</sup> Ford, 'Trade Cycle in Britain', p. 33.

<sup>6</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 31.

<sup>7</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II. p. 534.

<sup>8</sup> Cairncross, *Home and Foreign Investment*, pp. 9-10.

## Harvests

The state of the UK harvest exerted a significant impact on overall levels of economic activity until the middle years of the nineteenth century. Rostow believed that 'For the period to 1850, clearly, and probably to the seventies, the domestic harvests played a significant part in British trade fluctuations.'<sup>1</sup> Aldcroft and Fearon similarly write that, although declining in importance in the economy during the first half of the nineteenth century, agriculture was still large enough to ensure that the state of the harvest had 'a considerable influence on the business cycle generally'.<sup>2</sup> There were two main transmission mechanisms between a good harvest and overall economic activity:

1. A good harvest raised real wages of workers by reducing the price of food. Since demand for food was inelastic, this led to an increase in demand for non-food items, boosting the wider economy.
2. A good harvest reduced the need for food imports from abroad. This reduced pressure on the balance of payments, easing monetary conditions and reducing the outflow of spending on imports, having a net stimulating effect on GNP. Similarly a bad harvest reduced real incomes and increased the flow of money abroad.

There was, indeed, a positive relationship between the state of the harvest and the overall cycle. 'Good harvests', write Aldcroft and Fearon, 'usually occurred during the main upswings while bad harvests tended to predominate around peaks or just after. Either way they contributed to the particular phase of the cycle ...'<sup>3</sup> Rostow and Aldcroft and Fearon (both deriving their assessments from the work of Gayer, Rostow, and Swartz) agree that the good harvests of 1820-3, 1832-5, 1843-4, and 1850-2 helped foster major cycle expansions, while the high wheat prices of 1817-18, 1824-5, 1836-7, and 1846-7 exerted a deflationary effect upon the economy. The below diagram illustrates the unstable nature of wheat prices through the eighteenth and into the nineteenth centuries.<sup>4</sup>

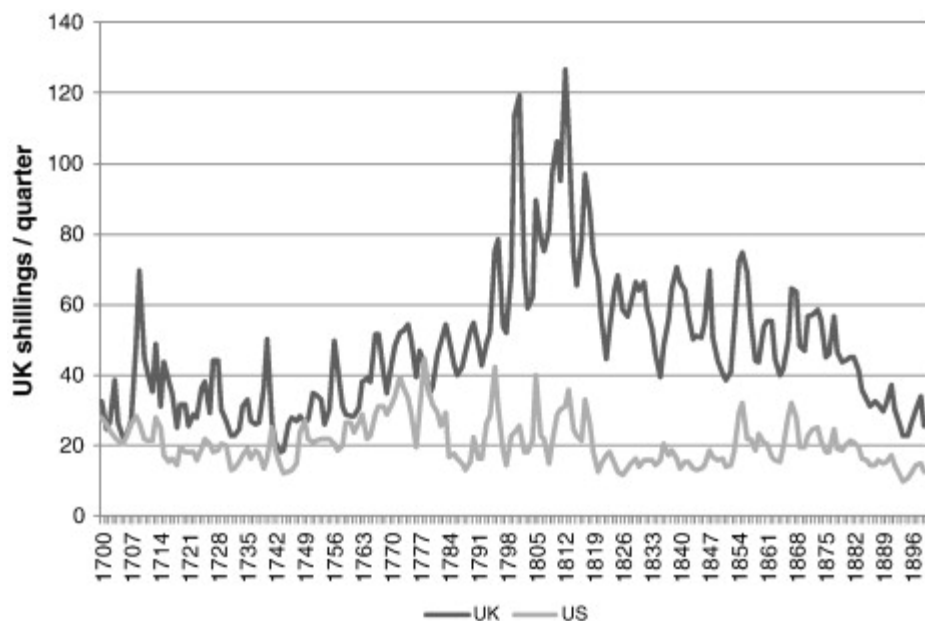
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<sup>1</sup> Rostow, *British Economy of the Nineteenth Century*, p. 50.

<sup>2</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 38.

<sup>3</sup> *Ibid*, p. 43.

<sup>4</sup> Source: <http://www.sciencedirect.com/science/article/pii/S0014498312000472>



**Figure Five. Wheat Prices in the UK and US 1700-1900**

However, by the second half of the nineteenth century the influence of harvests on the wider level of economic activity is generally believed to have become trivial. Two main reasons are given for this. First, agriculture's share of total economic activity had greatly declined. From a share of national income approaching 50% in the eighteenth century, by 1881 agriculture accounted for just 10% of national income, with the figure falling still further by 1900 to 6.4%. Second, from the 1870s Britain began to buy an ever-larger share of its foodstuffs on the global market, which meant that prices were set more globally than nationally. With increasing access to a global market for food, the amplitude of British food prices due to harvest variation declined. Thus Aldcroft and Fearon, citing Beveridge's finding that there was no correlation between industrial activity and wheat prices in the period 1856-1913, conclude that: 'harvest fluctuations become of negligible importance to the study of the business cycle in the latter half of the nineteenth century.'<sup>1</sup>

## Monetary Policy and Interest Rates

Thus far we have found that fluctuations in UK business activity over the nineteenth century were caused by variations in aggregate demand, and that the main factors affecting aggregate demand were variations in exports, investment, and harvests (affecting consumer spending and imports). Little has been said about what causes these variations in spending. In the case of harvests, the weather was clearly the relevant factor. But what of exports and investment? Here there was one influence that was linked to both exports and investment, and which had a special capacity to impact on the latter, and which by

<sup>1</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 43.

the prevalence of its effects has long had a fair claim to be an originating cause of the nineteenth century cycle as such: monetary policy and the interest rate. Monetary factors, as we have observed, play a central role in several theories of the cycle, such as those of Hayek, Hawtrey, Fisher, and Friedman. Is there any evidence for the proposition, advanced by Hawtrey, that the business cycle was a 'purely monetary phenomenon'?

The basic relationship between interest rates and the cycle was this. At the bottom of the cycle, the Bank of England Bank Rate would generally be falling, as would market rates for short term borrowing more generally. This fall in interest rates was, clearly, one factor that might help to initiate the process of economic recovery. For whatever reason, a recovery begins and total output grows. As the economy grows so did the money supply as banks lent more money on credit. Also, as business activity and incomes increased, firms and individuals would require more gold and paper cash, and Bank of England gold and paper currency balances would decline as they released more cash into the economy. A happy growth path would seem to be established, with the economy growing in real terms and the Banking system providing the credit and cash to accommodate the expansion. At this point, however, monetary factors generally took a turn for the worse in such a way that it is possible to see monetary forces as the ones bringing about an end to the boom and the beginning of the recession. This is because as the boom proceeded the Bank of England would begin to raise Bank Rate and it is this rise in interest rates that, it has been contended, brought the boom itself to an end. Why did the Bank raise interest rates in the boom? The reason was due to the Bank's responsibility to uphold the Gold Standard. The operation of the Gold Standard required that paper claims on the Bank be redeemable as gold. If this pledge to honour gold claims were to be sustained the Bank of England clearly had to carry enough gold to meet its obligations. This meant keeping a ratio between the Bank's gold reserves and its liabilities in terms of paper money. Basically, as the boom proceeded this reserve ratio came under pressure for two reasons:

1. Domestic economic activity generated increasing demands for gold and there would be a drain of gold from the Bank into the economy. This was of limited importance.
2. More important: as the economy grew, the balance of payments tended to move into deficit on current account with a net outflow of gold. British imports from abroad would be rising and foreign producers would therefore have claims on British gold. Second, during booms British institutions and individuals tended to invest more money abroad, and investing money abroad similarly led to a flow of gold out of Britain to pay for foreign currency. As a result, Britain's balance of payments went into deficit over the boom, even if that boom itself was often initially stirred by an increase in exports. Any harvest failures during the boom period would similarly increase pressure on the balance of payments and hence the Bank of England's reserves.

Thus, with total credit money supply increasing on the one side, and the Bank's gold reserves contract in the other, the Bank of England was forced to take action to restore its gold ratios by raising its interest rate (Bank Rate). Raising Bank rate tempted external gold to flow into the London markets. It also discouraged merchants from discounting bills on



the Bank of England, for which they would now get a lower price. Unable to get cash at favourable rates by discounting the bills they held, merchants would be forced to sell stocks at low prices and scale back their purchases. And with fewer bills being brought to the Bank for conversion into cash, the issue of paper currency would be curbed. Credit conditions in the economy tightened and this, it is argued, led to purchases of stocks and investment being scaled back, with the result that a recession began. Initially, as the economy declined, Bank Rate remained high, pushing the economy further down and closing the deficit on the balance of payments. Only later as monetary pressures eased would the Bank begin to lower the interest rates at which it discounted bills – and it was this lowering process that would, in time, induce greater investment and economic recovery.

Thus, Bank of England conduct impacted on the performance of the economy as a whole. Arthur Lewis writes that as soon as the Bank of England's gold reserves fell to danger level, which in the 1870s was considered to be around £10 million, the Bank would raise Bank Rate and use other means to get commercial banks to restrict their lending. Given that total gold reserves in the early 1870s were only around £12.8 million, the Bank of England was justifiably nervous. Whenever there was a Juglar upswing the Bank began to lose gold and it was, accordingly, always 'ready to cut short the Juglar upswing, in the interest of its gold reserve, whether or not there was unused industrial capacity or domestic financial hazard.'<sup>1</sup>

What were the transmission mechanism between the Bank Rate and the real economy?

1. An increase in interest rates would have raised the cost of loans, making prospective investment less profitable and leading to a fall in investment, which would have in turn precipitated a negative multiplier effect.
2. According to Hawtrey, increased interest rates by making it less remunerative to discount bills would have caused merchants to run down stocks to restore their liquidity, which in turn would have cut demand for finished products.
3. A rise in interest rates might have had a psychological effect, causing investors to make less optimistic predictions regarding the future, so downgrading the estimated marginal efficiency of capital, again leading to a reduction in investment.

What evidence is there that monetary conditions were the leading explanatory variable in the business cycle?

1. It is true that Bank Rate and market rates of interest did move in ways that promoted the operation of a cycle. Rostow observes that, in early stages of revival, there was usually easy money, with falling rates of interest. Within the Bank of England bullion increased, bills and notes discounted fell, and Bank Rate fell or remained steady. In later stages of expansion there was gradual tightening of money market. The market rate of interest and then the bank rate rose. After the peak, interest rates continued to rise, but credit advances outside the bank fall off. The Bank's discounts rose, often rapidly, as it fulfilled its role as

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<sup>1</sup> Lewis, *Growth and Fluctuations*, p. 35.



lender of last resort. The great financial crises of the era occur, nearly always, after the downturn of the cycle.<sup>1</sup>

2. While Ford is correct to notice that Bank Rate generally moved with the cycle, rising in booms and falling in recessions, suggesting it was more of a dependent than an independent variable (since rising interest rates cannot be held to be a cause of recovery), it is the timing of the changes that are crucial and the capacity for the two series to move against each other at critical junctures – i.e. for interest rates to rise as the economy as a whole faltered, or for interest rates to fall while the economy was in recession. It was this that gave interest rates their potentially destabilising effect. For example, in the 1840s and 1850s expansions were, says Aldcroft and Richardson, helped by monetary developments. In 1840s the boom was encouraged by easy credit and cheap money by the Bank of England. Bank Rate from 1844 to 1846 varied between 2.5 and 3.5%. This encouraged speculative excesses. Then the peak of 1847 saw interest rates rise to 8%, being then slow to fall, only reaching 4% in January 1848 when recession was far advanced. In the 1850s an influx of gold encouraged growth of credit which culminated in crisis of 1857, when Bank Rate hit 10% in November 1857, helping to precipitate a panic. Cheap money encouraged the upswings of 1862-5 (Bank Rate averaging 2.5% through 1862), 1873-4 (Bank Rate averaging a little over 3% for most of 1873), and 1887-9 (Bank Rate being around 3% for most of the years 1885-1888).<sup>2</sup> Therefore, monetary policy tended to worsen downturns, as the rise in interest rates occurred at the peak and the slow fall in interest rates meant that the recession worsened. Aldcroft and Fearon conclude that:

In general, Bank Rate tended to move with the cycle though the timing of changes was not always the most propitious from a domestic point of view, and on occasions there was often open conflict. ... monetary forces were a significant influence during upswings and at the upper turning-points and they frequently operated in a destabilising manner.<sup>3</sup>

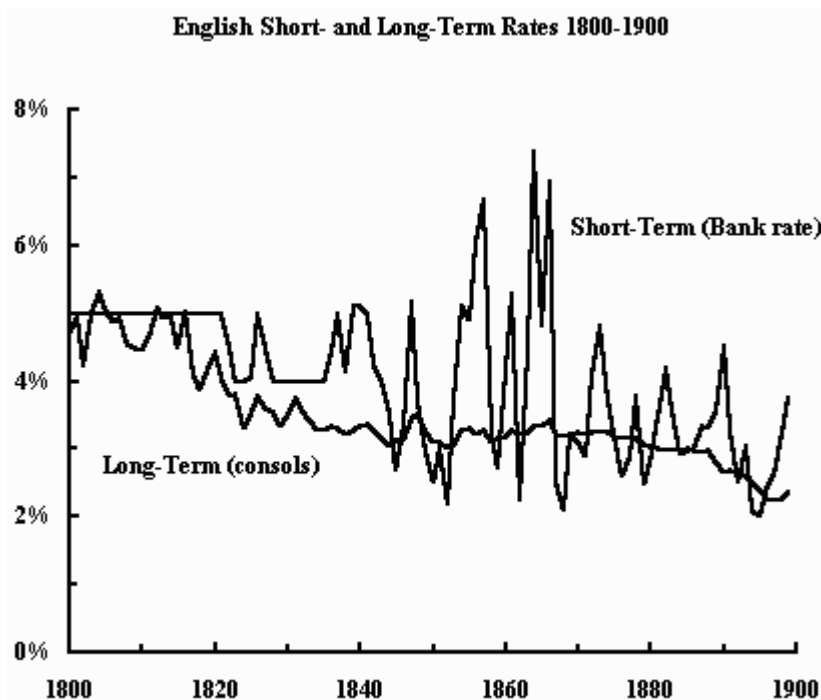
3. As the below diagram shows, short-term interest rates did fluctuate markedly from the 1830s onwards and did so in a broadly cyclical fashion, with peaks giving way to troughs, and troughs to peaks.

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<sup>1</sup> Rostow, *British Economy of the Nineteenth Century*, p. 56.

<sup>2</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 54.

<sup>3</sup> *Ibid.*, pp. 55-6.



**Figure Six. Short and Long-Term Interest Rates in England 1800-1900**

The impact of Bank of England policy on the money market became more pronounced from the 1840s. In the first half of the century the banking system was varied and unorganised. There were a large number of different country banks and London banks. The Bank of England exerted limited control and Bank Rate tended to follow the movements in the market rate of interest. The result, say Aldcroft and Fearon, was an elastic supply of credit, which adjusted to business conditions.<sup>1</sup> From the 1850s banking became more organised: there was a decline in country and private banks, a growth of joint stock banks, and a stronger position for the bank of England. In consequence the supply of credit became less elastic and Bank of England control became stronger and quicker to take effect.<sup>2</sup> It is therefore from the 1840s that the Bank of England began to exert a more instrumental role in the business cycle.

4. Lewis notes that Jacob Viner argued, in a 1945 article, that the Bank of England was trying to run its policies with too small a gold reserve. Its lack of gold meant that economic recoveries, which soon led to pressure on the foreign exchanges, then led the bank to restrictive measures, cutting off the growth process. If the Bank had had larger reserves it could have ignored cyclical fluctuations. It was argued at the time that the Bank preferred to hold interest-bearing securities rather than sterile gold. It should also have held more foreign currency (which it could have cashed in for gold) or it could have held more deposits from British banks.

<sup>1</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 49.

<sup>2</sup> *Ibid.*

What needs to be emphasised is that, so far as Bank of England policy *did* play a part in generating the nineteenth century business cycle, it did so as an unintended consequence of operating the gold standard. It was the rules governing the convertibility of paper money into gold that ensured that the Bank had to maintain a reserve ratio of gold, and this necessitated the Bank taking measures to either dampen or stimulate the growth of credit as a means to that end. The Bank wasn't seeking to implement a modern monetary policy to control, say, inflation or employment. It was seeking merely to maintain the gold standard and its Bank Rate policy was an off-shoot of that.

However, the idea that monetary forces governed the cycle, though advocated forcibly by Hawtrey, has been generally rejected by historians. Several reasons are advanced for this scepticism:

1. Aldcroft and Fearon point out that, over the cycle as a whole, Bank Rate tended to move with the cycle – i.e. Bank Rate rose during the boom as gold reserves declined, and fell during the slump as gold reserves rose. Thus, Bank Rate moved counter-cyclically, dampening booms and off-setting slumps, and was therefore potentially stabilising.<sup>1</sup> Ford agrees. There were, he says, 30 similar turning points between Bank Rate and income between 1870 and 1909 and 9 opposite ones. In this sense monetary policy was stabilising.<sup>2</sup>

2. It is generally argued that there is little evidence that monetary factors were causal ones in the growth process. Rather, it is believed that the money supply adjusted to the demands of trade and accommodated itself to business conditions. Scarcity of money, writes Rostow, was less than scarcity of other factors in the peak of the boom: 'In no cycle, over this period, does inelasticity in the supply of money appear to have been the decisive factor in determining the moment of the downturn.' The Bank of England played an essentially passive role, meeting the demands of trade, whether in the upswing or the down.<sup>3</sup> Ford's more detailed analysis found that the stock of money (bank deposits and advances) adjusted to demands for accommodation and was thus a passive factor. The figures for bank advances and discounts move in line with net national income 78% of the time between 1870 and 1910, suggesting fluctuations in money stock were indeed a dependent variable.<sup>4</sup> Sayers believed the increase in interest rates usually occurred when the boom was already breaking and thus worsened the downturn.

3. The link between interest rates and investment is considered to be weak. In the nineteenth century most business investment was funded out of profits or local business connections. Little was raised on the London financial markets, which specialised in lending to governments and overseas issues. Further, it is contended that short term variations in interest rates – which often varied several times in one year – were unlikely to impact on long-term investment projects. 'Putting Bank Rate up from 2 to 4 percent for

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<sup>1</sup> *Ibid.*, p. 50.

<sup>2</sup> Ford, 'British Economic Fluctuations', p. 138.

<sup>3</sup> Rostow, *British Economy of the Nineteenth Century*, p. 57.

<sup>4</sup> Ford, 'British Economic Fluctuations', p. 145.

six months', writes Lewis, 'had little effect on the cost of manufacturing or mining, and can hardly have affected decisions on how much to invest in the iron industry ...'<sup>1</sup>

## What Caused the British Business Cycle of the Nineteenth Century?

The British business cycle thus appears to be a product of the interaction of three variables:

Export demand

Investment spending

Interest rates and credit

### Exports

Most commentators attach primary importance to export demand. What, then, accounts for the cyclical behaviour of exports? Gayer *et. al.*, with respect to the period 1790 to 1850, note, first, that export cycles were on average four years in length – i.e. a given peak in exports was succeeded by the next peak about four years later. Second, they emphasise the importance of textile exports within total British exports. In essence, the question becomes: why did British textile exports fluctuate in the period before 1850? Four factors are relevant here:

1. The real incomes of foreign consumers of British products. This would fluctuate with the state of trade in these importing countries. Given the importance of agriculture in British export markets the main factor driving income fluctuations overseas was surely the state of the harvest, which is known to fluctuate rhythmically.
2. Time lags in the order and supply chain. British exports were handled by wholesale merchants. It was they who responded to increased orders abroad, who ran down stocks and made orders, and delivered the finished products. When demand rose abroad and prices rose, merchants would at first run down their stocks before submitting orders to producers. It took time for output to increase and the supply (mainly of textiles) to become available. As supply on overseas markets increased significantly the market would be saturated, pushing down prices and profits. Merchants would respond by cutting back orders and output would fall. This continued until foreign market prices recovered and the process was initiated again. There was thus, says Rostow, 'a tendency for British foreign trade to fluctuate cyclically, in what we might call an inventory cycle.'<sup>2</sup>
3. Credit conditions. Export trade was largely done on credit – goods were sold on credit and merchants funded purchases on credit. Hence tight monetary conditions might cause a fall in exports even if foreign demand was unaffected: merchants struggling to discount bills would cut back their orders, reducing demand to British firms, or they would be less

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<sup>1</sup> Lewis, *Growth and Fluctuations*, p. 57.

<sup>2</sup> Rostow, *British Economy of the Nineteenth Century*, pp. 39-40.

willing to extend credit to overseas buyers. This, of course, was the point made by Hawtrey.

4. British overseas investment. A key source of demand for British goods arose from British investment in the purchasing country. When British investment increased to a country that country had more money for purchasing goods, and this included a large share of British goods. Thus, export demand was partly a function of British investment and thus reflected the state of the British economy and credit conditions there.

Gayer *et al.* believe that the second and fourth factors were most important, attributing the main export driver of the British business cycle to fluctuating demand for British goods in North America. While Europe took a greater share of British exports, the European demand was more stable and tended to decline as a share of exports in the recovery phase. Exports to North America fluctuated for four interconnected reasons. First, the secular growth of American demand for British goods meant that in normal times US demand for British exports would be rising. Second, economic crises in Britain with associated credit stringency had the effect of depressing (*via* the activities of merchants) American demand in slump phases of the cycle. As the British crisis passed and credit flows revived exports to North America resumed their natural upward course. Third, these effects were exacerbated by flows of British capital to America, which increased in boom periods, fuelling still further the rise in exports to North America (and South America also). Fourth, there was the impact of the autonomous American cycle. On balance they conclude that the export cycle was largely endogenously generated within the British economy:

After financial panic had ended and prices and interest rates had fallen, there were ready markets for British manufactured goods. Financial stringency in Britain was capable of reducing the flow of goods abroad to a subnormal level ... the immediate and substantial revivals in exports in years following financial panics are largely explained as a kind of reaction to depleted inventories ... the institutional framework within which British foreign trade operated decreed an underlying and persistent tendency for secular expansion in British exports to take the form of recurrent inventory cycles of relatively short duration.<sup>1</sup>

Rostow repeated these basic conclusions in his 1948 *British Economy in the Nineteenth Century*. However, unlike Gayer *et al.*, he took his analysis into the second half of the nineteenth century and argued that in this period the inventory minor export cycle was eclipsed by the growth in importance of an investment cycle as British exports became more based on a wider array of industrial products like metals and engineering. For example, in 1841 cotton textile and woollen goods exports were five times as large in value as exports of iron and steel, machinery, and non-ferrous metal goods. By 1891 cotton and wool exports were only twice as high in value.<sup>2</sup> As a result 'the long-term investment cycle became increasingly dominant'. One symptom of this is that cycles became of longer

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<sup>1</sup> Gayer *et al.*, *Growth and Fluctuation of the British Economy*, II. pp. 545-6, 550.

<sup>2</sup> B.R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (1962), pp. 303-304.

duration as the four-year inventory cycle (what is often referred to as a Kitchin cycle) was merged into a longer nine-year cycle and disappears from the UK cycle.

Thus, the statistical conclusion that the average duration of trade cycles increased after 1860 is to be understood in general as the shifting from a secondary to a primary position in the rhythm of long-term investment; and a reduction in the relative status within the world economy of the shorter rhythm which, for Britain, took the form notably of textile exports.<sup>1</sup>

So what caused the export cycle? In the pre-1850 period, as we have seen, Gayer *et. al.* attribute it to the combined effect of a secular growth trend for British exports and the periodic effects of the domestic cycle linked primarily to credit conditions. What about in the decades after 1850, when the textile inventory cycle faded and the longer Juglar pattern became more pronounced? It is still possible that there was a link between domestic economic conditions and exports, the link now being through fluctuations in overseas lending. This is discussed below. However, the evidence suggests this was not sufficient to render exports an endogenously determined variable. What seems more likely is that British exports fluctuated in response to a European or even world business cycle. While some historians question whether the world economy was sufficiently integrated by the later nineteenth century for it to be possible to talk of a global business cycle, an increasing proportion of British exports were to Europe and here it has been observed that there was a strong correlation between the business cycles of Britain, Germany and France (which were in phase for 83% of all months between 1879 and 1914), suggesting that the British cycle was a sub-set of a bigger European cycle. Beveridge went further, arguing that the British trade cycle broadly followed the corresponding cycles in Europe *and* the United States and labelling the British cycle itself the ‘international trade cycle.’<sup>2</sup> The existence, he believed, of an international trade cycle from the early nineteenth century was established ‘empirically and beyond question’. R.S. Sayers agrees, writing in 1967 that the ‘clearest impression of all is that the British cycle of good and bad trade practically always turned on what was happening in the outside world.’ However he goes on to highlight, specifically, the role of the United States: ‘Mostly – but not in every instance – the first indication of a turn in the tide was a turn upwards or downwards in the flow of orders for exports to the USA ... it was again and again this market that brought the turn of the tide. The British cycle followed the American cycle ...’<sup>3</sup> Coppock similarly focuses upon the role of the Americas, contending that the British export cycle was driven primarily by the American building cycle in the second half of the nineteenth century. Exports to the Americas (North and South) accounted for around 20 per cent of British exports between 1870 and 1913. More importantly, they fluctuated much more than exports to Europe or Asia. ‘Thus’, he writes, ‘the U.S. factor was the major contributor

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<sup>1</sup> Rostow, *British Economy of the Nineteenth Century*, pp. 42-3.

<sup>2</sup> Ford, ‘The Trade cycle in Britain’, p. 38; Beveridge, *Full employment*, pp. 281-84.

<sup>3</sup> R.S. Sayers, *A History of Economic Change in England 1880-1913* (1967), p. 43.



to the secular swings in U.K. exports being responsible for 50 per cent of the change from 1878 to 1882 and 1889 to 1893 and 40 per cent of the change from 1901 to 1907.’<sup>1</sup> On this reading, therefore, the British business cycle was a reflection of an American transport-building cycle driven by immigration and railroad construction.

## **Determinants of Investment Fluctuations**

Gayer *et. al.* see investment fluctuations as central to defining the major cycles of the British economy, which occurred across an average duration of nine years. They date major cycle peaks to the years 1802, 1810, 1818, 1825, 1836, and 1845. These major cycles reflected the combined impact of export increases and increases in new capital construction. What, then, explained ‘the rhythm of domestic investment’?<sup>2</sup> They begin by noting that capital investment tended to increase only towards the end of the cyclical expansion. Why did it increase then? First, only after the recovery had been underway for some time did existing factories begin to approach the kind of full-capacity that would motivate a search for additional plant and buildings. Second, economic prosperity encouraged entrepreneurs to raise their expectations of future growth and profits – raising, in effect, the expected Marginal Efficiency of Investment. Third, given that most capital investment (Cairncross estimates at least half) was funded out of retained profits, it was in the latter stages of recovery that the funds would be sufficient to fund capital outlays.<sup>3</sup> *There would thus be a lagged relationship between economic conditions and investment projects.* Of course, with most firms responding to the same business environment, the decision to invest would tend to coincide. There would then be a further lag as investment plans were actually put into practice. Once the new plant came into production and use output would increase beyond expectations as the expansion decisions of a number of firms came to fruition at the same time. With output surging, supply increased, pushing down prices and profits and leading firms into losses, causing firms then to reign back capital investment in the trough and thus, by necessity, wait until a renewed period of growth initiated, say, by export demand, led them again to plan increases in their investment. By this means a nine-year cycle was generated.<sup>4</sup> As Rostow summarises:

The first impact of recovery, for Britain, came normally through an increased demand for exports, especially of consumer goods. This involved only short-term financing, usually from London, and thus relatively minor hostages to fortune. Then, gradually, one can trace the growth of daring, often leading to a concentration of interest in a particular line of new investment, at home or abroad, in the final stage of expansion.<sup>5</sup>

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<sup>1</sup> D.J. Coppock, ‘The causes of Business Fluctuations’, in Aldcroft and Fearon (eds), *British Economic Fluctuations, 1790-1939* (1972), p. 208.

<sup>2</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II., p. 551.

<sup>3</sup> Cairncross, *Home and Foreign Investment*, p. 98.

<sup>4</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II pp. 553-57.

<sup>5</sup> Rostow, *British Economy of the Nineteenth Century*, p. 55.

Thus, the analyses of Gayer *et. al.* and Rostow suggests that the Juglar cycle in Britain before 1850 was generated by the combination of an accelerator investment response to rising export-led demand together with the delayed effect produced by the propensity of firms to fund capital investment out of retained profits. Export-led growth in demand generated a multiplier through the economy which, with a lag, stimulated the reason, the optimism, and the resources to undertake increased capital investment – investment which often came on stream *after* the peak of economic activity had already occurred. Aldcroft and Fearon suggest that this remained the broad pattern of events after the 1850s. ‘To hazard an opinion’, they write, ‘it might be suggested that exports were the chief element of instability and were partly responsible for fluctuations in investment, though of course the latter was influenced by purely domestic forces as well.’<sup>1</sup> This is very much the view of Ford also, who believes that home investment did not play a dominant role in the cycle, but rather investment spending ‘magnified the effects of export fluctuations in the British cycle...’<sup>2</sup> The mechanisms determining home investment in the post-1850 period would seem to have been similar to those identified by Gayer *et. al.* for the earlier period. Company profits continued to be a determining factor in investment decisions – Ford noting that the level of company profits tended to peak one year before the level of economic activity. This was important since it remained the case that self-finance out of profits was a key source of investment funds within the British economy.<sup>3</sup> Profits were also a basis for guiding expectations of future returns, and rising profits would have raised the expected marginal efficiency of investment projects, encouraging firms to undertake capital projects. So economic recovery out of the slump, encouraged by rising export demand and low interest rates, would have generated the funds spurring an increase in investment, which would have boosted national income still higher. In addition, certain industries benefited directly from growing export demand – the clearest example being investment in shipbuilding capacity, which was closely correlated with variations in British trade. Once initiated by rising demand, domestic and external, investment projects were characterised by lags in completion and indivisibilities in construction and operation, which meant that new capacity often came into play once the peak of the boom had already passed and contributed to excess capacity and falling prices in the downswing. It was this tendency for capital investment to overshoot through what later came to be known as the Accelerator process that Robertson ascribed the business cycle in his 1915 *Study of Industrial Fluctuation*. The future productivity of investment projects had to be estimated, he observed, and ‘since both this productivity itself is liable to variation, and also any forecast of it is at best a matter of guess-work, there is clearly room for considerable variation in the estimates formed of the marginal utility of construction goods.’

It is the author’s conviction that it is these variations which furnish the key to the most important aspects of modern industrial fluctuations. The most characteristic feature of a

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<sup>1</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 31.

<sup>2</sup> Ford, ‘The Trade Cycle in Britain’, p. 42.

<sup>3</sup> *Ibid.*, p. 40.

modern industrial boom is the utilisation of an abnormally large proportion both of the past accumulations and of the current production of consumable goods to elicit the production not of other consumable goods but of construction goods.<sup>1</sup>

This, it will be observed, is very much the analysis that was later to be arrived at by Gayer *et. al.* with reference to the period before 1850. Investment, then, almost certainly played a major role in determining the overall shape of the cycle, its increase driving the expansion and then its propensity to overshoot contributing to the downturn. But did investment initiate the cycle? It is possible that it did if the recession through its effects in reducing costs of raw materials, and lowering the cost of borrowing, and raising consumption demand if money wages fell less than prices, and the postponed replacement of capital due to depreciation causing firms to begin to replace obsolete capital, and if low interest rates and an end to the downturn caused business expectations of future profits to rise. In these circumstances an internally induced investment cycle could have explained the basic outlines of the actual cycle. Matthews, in his study of the trade cycle during the period 1833 to 1842, found that investment spending was the dominate factor, both leading the recovery in 1833, while the ‘deterioration in trade that took place in 1841-2 was primarily caused by the fall in domestic investment.’<sup>2</sup> In reality we cannot say that this was what, in fact, explained the generality of cycles since exports were not constant – they were themselves varying, so we cannot discern a pure investment cycle. If we look at the turning point years from slump to recovery across the period 1858 to 1913 we find that, of the 8 turning points occurring within the period, in 4 both exports and total fixed capital formation increased in real terms, in 3 exports were the dominant factor (with capital investment constant or falling), and in 1 capital investment was dominant, with exports falling. *On balance, therefore, recoveries during these years were nearly always associated with increased export demand*, and in most (but not all) cases total capital investment moved with exports, making it hard to claim that investment demand initiated most cycles by itself. Equally, looking at the seven down-turn years between 1858 and 1913, we see that four of these coincided with a fall in exports while investment was still increasing; two were associated with a fall in investment while exports were still rising; and in one (1907-08) both exports and investment spending fell together. Again, therefore, investment spending does not seem usually to have *led* the cycle in either its up or down-swings, but still it *exacerbated* the cycle and helped to account for the severity of the contraction once the investment projects initiated at the upper end of the growth phase came into operation.

## Monetary and Credit Policy

What was the role of monetary forces in the business cycle? Monetary variables certainly fluctuated over the course of the cycle. According to Gayer *et. al.* the course of monetary indicators over the cycle followed a regular pattern:

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<sup>1</sup> D.H. Roberston, *A Study of Industrial Fluctuation* (1915), p. 157.

<sup>2</sup> R.C.O. Matthews, *A Study in Trade Cycle History* (1954), p. 215.

- At the beginning of the upswing the market rate of interest tended to be low, as did the Bank of England Base Rate. Bank discounting of Bills would be low, and this, combined with favourable balance of payments, meant the Bank of England's gold bullion reserve would be rising. The ratio of paper money and credit to gold and asset reserves was relatively low.
- In the later phases of the recovery Bank of England gold reserves decline as more commercial customers bring bills to be discounted, while individuals withdraw gold for transactions, and the Balance of Payments moves towards deficit as imports increase. At the same time total bank lending increases as borrowing rises. There is a fall in the ratio of Bank of England reserves to the total liabilities of paper money (which was convertible into gold). With rising demand for credit to finance trade the market rate of interest rises. Bank of England Bank Rate follows as the Bank tries to stem the loss of gold and attract foreign gold to Britain.
- Beginning of the downturn. Interest rates continue to rise as individuals and firms seek liquidity as business conditions deteriorate. Bonds are sold, pushing down price and raising interest rates further. The Bank discounts bills in its capacity as lender of last resort and its gold reserves continue to fall. Even after the initial crisis passes and market rates start to fall, the Bank Rate will lag as the Bank of England continues to strive to restore its gold asset base. Gold bullion reserve starts to rise and total amount of bank credit issued declines.
- Late depression. With Bank of England gold reserves restored the Bank Rate follows the market rate downwards. Interest rates now low – what was called Easy Money. Bank lending still low due to depressed trade conditions.

As can be seen from Gayer *et. al.*'s analysis, monetary conditions had the capacity to shape or even determine the business cycle at every stage. However, it is the upper turning point they focus on: namely, how far did the tightening of money markets during the latter stages of the boom bring about the subsequent down-turn? Here they are quite clear that monetary forces did *not* initiate the downturn. Their arguments for this are:

1. The tensions in the money markets in the latter phases of the boom were mild and not in themselves sufficient to bring about a reversal in economic conditions.
2. The real economy tended to hit full employment and capacity at the peak of the boom irrespective of what was happening in the money economy. In other words, the upper turning point was not a monetary phenomenon.
3. Actual downturns were associated with factors 'outside the British monetary mechanism' such as a stock market crash or the collapse of an export boom or a rise in bankruptcies, or a rise in costs. 'All these were capable of reversing the current state of expectations and, in a real sense, initiating depression.'<sup>1</sup>

Thus, Gayer *et. al.* contend that recessions originated in the real economy and the developments in the money economy essentially mirrored and reinforced these developments – they did not lead or determine them.

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<sup>1</sup> Gayer *et. al.*, *Growth and Fluctuation of the British Economy*, II. pp. 561-62.

Rising interest rates ... like rising prices, merely symbolised an approach to an unstable position of industrial full employment characterised by rising prices and wages. The level of costs was one of the determinants of the expected yield on new investment. It is our judgement that it was from fundamental changes in the environment for new investment rather than from merely a short-term credit shortage that the turning point resulted. Like the supply of labour or of commodities or of accumulated savings, the short-run money supply set a limit to the extent to which expansion could proceed. But that limit was essentially an elastic one, more elastic, in fact, than for other factors. So long as confidence prevailed the money supply was ample. The major cycle upper turning points, it is maintained, were brought about by a variety of factors arising out of full employment in one or more markets, and by a changing view of the prospects for further investment in the main lines of development which formed the pillars of the latter stages of the major cycle expansions.<sup>1</sup>

Rostow summarised this position in his *British Economy of the Nineteenth Century*. While acknowledging that rising interest rates might have raised costs and damaged confidence in future prosperity, he believes that it was the set of factors determining investment, rather than the supply of short-term credit, that initiated the turning-point. 'In no cycle, over this period, does inelasticity in the supply of money appear to have been the decisive factor in determining the moment of the downturn.'<sup>2</sup>

This scepticism regarding the role of monetary forces in determining the cycle is widely held among commentators. In 1915 D.H. Robertson argued that 'Monetary influences, though they aggravate the severity of the crisis, are not its essential cause.'<sup>3</sup> Aldcroft and Fearon endorse Gayer *et. al.*'s view of the role of money in the period up to the mid-1850s, noting that the money supply was determined by the actions of numerous banks and largely adjusted to the needs of trade. From the 1850s the financial markets became more structured around the overarching control of the Bank of England, and so Bank of England monetary policy – namely, its Bank Rate policy – did begin to have a more leading role in determining money market conditions. This Bank Rate policy was in turn largely determined by the need to maintain the bullion reserves necessary to sustain the gold standard and was not driven by a concern with domestic economic conditions as such. This still meant, however, that Bank Rate rose in the later stages of the boom and as such might, potentially, have been the factor that broke the expansionary phase. But did it? As we have seen, Aldcroft and Fearon doubt that it had this effect in general. 'The general impression one gets is that economic activity was not particularly responsive to variations in rates of interest.'<sup>4</sup> What were the potential links? First, a rise in short-term interest rates might make merchants less willing to hold stocks. If so, then demand for British firms would decline and also British imports from overseas would decline, which in turn would probably reduce exports after some lag. Second, interest rates acted as a

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<sup>1</sup> *Ibid.*, p. 562.

<sup>2</sup> Rostow, *British Economy of the Nineteenth Century*, p. 57.

<sup>3</sup> Robertson, *Study of Industrial Fluctuation*, p. 218.

<sup>4</sup> Aldcroft and Fearon, *British Economic Fluctuations*, p. 51.



‘psychological barometer as regards the state of trade’.<sup>1</sup> When interest rates rose lenders would become more wary, as would borrowers. As such a sharp rise in Bank Rate near the peak could precipitate a loss of confidence and aggravate the downturn. Third, by generally pursuing lax monetary policies with low interest rates at the beginning of the boom, Bank policy aggravated expansionary tendencies – just as the delayed process by which it raised rates meant that interest rates continued to rise even after the downturn, worsening the slump. These processes were at work, suggest Aldcroft and Fearon, in the expansions of the 1840s and 1850s, which were ‘certainly helped along by monetary developments. The speculative activity and rail boom of the 1840s were spurred on by easy credit conditions and the cheap money policy of the Bank of England...’<sup>2</sup> Cheap money, they say, played a part in other upswings – in the 1850s, as gold flowed into the country and spurred a growth of credit, in 1862-5, in 1873-4, 1887-9, and 1907. Fourth, levels of interest rates had an effect upon the volume of overseas lending by the UK – which in turn impacted upon British exports and so the domestic economy. As Ford observed, long-term overseas lending was inversely related to Bank Rate.<sup>3</sup> An increase in UK interest rates would increase the cost of raising funds through overseas issues on the UK capital market, causing issues to decline and so investment projects to be constrained. By contrast low interest rates at the bottom of the slump would attract foreign issues and increase overseas investment, promoting recovery and expansion in the domestic economy. Ford discerns a two-year lag between a rise in Bank Rate and a fall in overseas issues, and a one-year lag between a fall in Bank Rate and a rise in issues.<sup>4</sup> Fluctuations in new overseas issues led, in turn, those in exports by between one and two years, meaning that it was possible to relate ‘British cyclical fluctuations ... to the varying pace of British overseas investment.’<sup>5</sup> As he explained in a later article:

Loans did lead directly to British export sales. Much of the British overseas lending in this period was developmental in character and devoted to social overhead capital formation such as railways, public utilities, port improvements; it was frequently undertaken with the hope of increasing the borrower’s capacity to produce and export primary produce. In these circumstances the use made by borrowers of the funds might be expected to stimulate their import purchases as they used the funds either to import capital goods ... or to finance extra spending at home, with an ultimate effect of increasing imports of consumer goods ... In the cases in which strong bilateral trading links existed between the borrower and Britain or where Britain was the major supplier of the required products, we would expect overseas lending by Britain to be followed by increased export sales by British industries.<sup>6</sup>

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<sup>1</sup> *Ibid.*

<sup>2</sup> *Ibid.*, p. 53.

<sup>3</sup> Ford, ‘British Economic Fluctuations’, p. 157.

<sup>4</sup> *Ibid.*, pp. 147-8.

<sup>5</sup> Quoted in Aldcroft and Richardson, *The British Economy 1870-1939*, p. 27.

<sup>6</sup> Ford, ‘The Trade Cycle in Britain’, p. 38.



Cairncross had earlier advanced the same argument, contending that ‘it was foreign rather than home investment that pulled Britain out of most depressions before 1914.’ It was, he says, ‘foreign investment and the prosperity of the export industries that set the pace for domestic construction.’<sup>1</sup> The areas of the world whose development was promoted by British capital bought the products of British export industries – whether it was steel rails and locomotives for American railroads or more textiles for the employed American workers.<sup>2</sup> Indeed, in his 1951 textbook *Introduction to Economics*, Cairncross saw the link between overseas investment and British exports as vindicating a Keynesian perspective on national income determination:

In the nineteenth century it was the common experience that the export industries were the first to feel the effects of a slump and the first to show signs of a recovery. This was not in conflict with the theory that fluctuations in investment are the main source of instability in employment. On the contrary, it was precisely because investment by Britain *in countries overseas* developed a cyclical pattern that exports to those and other countries fluctuated cyclically.<sup>3</sup>

However, three things qualify the potential link between domestic interest rates, overseas investment and export demand. First, we must consider how strong, exactly, was the link between British overseas investment and demand for British exports. There is reason to believe that Cairncross and others may have exaggerated this connection. Leland Jenks in his *The Migration of British Capital to 1875*, believes the correlation between British overseas investment and the export of capital goods ‘must not be too closely drawn.’ While it was strongest in the case of British investment in Indian railways, for whom ‘all of the iron material was imported from England’, this was not true of American railways, and in general ‘no relation can be traced between the destination of exported capital goods and the apparent field of activity of British investment.’<sup>4</sup> Evidence for Argentina in the late 1880s suggests that this is the case. Between 1885 and 1890, in what Saul calls a ‘frenzy of wild speculative activity’, total British investment of £129 million occurred. Although the amount fluctuated each year, this averaged £26 million per annum. During this same period the increase of British merchandise exports to Argentina equalled £5.3 million per annum, this increase being concentrated in demand for capital goods like iron and steel, railway carriages, and machine parts. There was thus a boosting effect on British exports but only, directly at least, about 25 per cent in value of the amount of capital invested.<sup>5</sup> This is not surprising given that, as Saul notes, usually one-third of Argentine imports came from Britain.<sup>6</sup> As British money poured in so did Argentine demand for goods from France, Italy, Belgium, and the United States. Over time this drainage of

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<sup>1</sup> Cairncross, *Home and Foreign Investment*, p. 188.

<sup>2</sup> *Ibid.*, p. 195.

<sup>3</sup> A. Cairncross, *Introduction to Economics* (1951), p. 517.

<sup>4</sup> L.H. Jenks, *The Migration of British Capital to 1875* (1927), pp. 174-75.

<sup>5</sup> S.B. Saul, *Studies in British Overseas Trade 1870-1914* (1960), pp. 72-74.

<sup>6</sup> *Ibid.*, p. 72.

British investment into demand for non-British goods increased with the rise of a range of economic powers like Germany and the USA, since this meant that recipient countries could source products from other producers. Thus, in the Argentine case, demand for British cotton textile imports actually fell in value over the years 1886-90 while textile imports from France, Belgium, Germany, and Italy increased. By 1889 even iron and steel imports from non-British countries to Argentina were exceeding those from Britain.<sup>1</sup> More strikingly, in the case of the United States, whereas in the mid-nineteenth century nearly all the rails used to build the American railway network were manufactured in Britain, this British-contribution contracted rapidly, until by 1900 the United States self-sufficient in railway manufacturing *and* was supplying most of Canada's rail-track needs and also a growing share of South American railway equipment. So, while Britain continued to fund the growth of railway networks in the Americas the direct demand effects on British exports were declining.<sup>2</sup> Second, British overseas lending fluctuated according to longer cycles – for example it was lower through the 1890s, which meant the degree to which overseas investment could lead export recovery varied between business cycles. Third, many factors affected British overseas lending besides UK interest rates – such as the level of economic activity in the receiving countries, political events, and levels of return on British domestic investment. In short, the link between domestic interest rates and overseas lending was a partial one, and the link between overseas issues and demand for British exports was partial too, so the connection between interest rates and exports, while inverse, was unlikely to have been an especially strong one and was probably diminishing over time.

At this stage a final caveat needs to be introduced: the discussions of the role of interest rates in the nineteenth century have tended to focus almost exclusively upon money rates of interest. However, economists usually emphasise the greater importance of **real interest rates** – which are money rates of interest adjusted for inflation. The Real Rate of Interest = the Money Rate – Inflation Rate. This can make a big difference to the variables under discussion. For example, in 1854 the money rate of interest was a relatively high 4.87, but inflation was also very high at 15.1%, so the REAL rate of interest was actually negative, at -10.23. Clearly borrowing was much more attractive when the real rate of interest was negative since the borrower would actually pay back less in real terms than they borrowed. If, then, money rates of interest appear relatively unimportant in determining the cycle, what about real rates of interest? Is there evidence that real rates of interest varied in a way that could have explained the behaviour of investment? There is some evidence for this. In particular, if we consider the 15 cycles between 1825 and 1914, then we find that, during downturns, real interest rates were rising across the cycle 73% of the time and falling 27%. By contrast in the booms, real interest rate fell over the cycle 80% of the time and rose 20%. The fact that real interest rates were generally falling in

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<sup>1</sup> *Ibid.*, p. 75.

<sup>2</sup> Sayers, *History of Economic Change in England*, p. 19.

booms and rising in slumps would suggest that there was a potential for interest rates to influence levels of investment over the cycle. But, again, whether interest rates determined the precise timing of the cycle is more doubtful. For example, if we take the first year of cycle recovery, i.e. the year in which the economy moved out of a trough, we find that real interest rates fell 7 times, rose 7 times, and stayed the same once. If we consider the second year of recovery the results are the same: real interest rates fell 8 times, rose 6, and remained the same once. There was thus no clear link between recovery and rising investment through falling real interest rates. Most strikingly, perhaps, in the last year of the boom, real interest rates were much more often falling than rising – they fell on 10 occasions and rose on 5. This suggests that rising real interest rates were NOT the cause of the downturn since, on average, real interest rates were falling when the slump began – the opposite of what Fisher suggested.

## Conclusion

Let us pull together as many of these complex threads as we can.

1. *The British economy in the nineteenth century was, without doubt, characterised by a Business Cycle.* The growth path of the economy was not even, and that growth varied around a trend, with periods of growth below trend being succeeded by periods of growth above trend, only to be followed by further periods below trend and so on. These fluctuations in the rate of growth followed a rhythmic pattern and were manifested across a series of indicators – output, prices, unemployment, balance of payments, and interest rates.
2. *The duration of this cycle showed some variation over the century.* From a periodicity of around 3-6 years in the years from 1815 to the 1850s, the average length of each cycle increased to around 7-8 years in the period after 1850.
3. *Although the precise form of the cycle evolved over the nineteenth century, the immediate cause of the cycle appears to have remained fairly constant, namely fluctuations in export and investment spending.* Together, variations in exports and investment spending accounted for around two-thirds of the variation in national income.
4. *What caused these variations in exports and investment?* Here the answer is much more complex.
  - i. *Most writers argue that it was exports rather than investment that were the initiating factor in the cycle.* Recoveries generally began with an increase in exports, just as downturns were led by a fall in the value of exports.
  - ii. *Why, then, did exports exhibit a cyclical pattern?* It seems that the reason for this shifted over the century. In the early nineteenth century the export cycle was short (around four years) and was what Gayer, Rostow, and Schwartz characterise as an *Inventory Cycle*. The natural trend of British exports, primarily textiles, was upwards. Export trade was financed by merchants on credit. In the upswing there were lags between the orders for products by merchants and the actual delivery of those products on foreign markets. Once British exports arrived in expanded volumes on foreign

markets there would be over-supply – prices fell, merchants found profits squeezed, and they would cut back their orders and deliveries. Exacerbating this were movements of interest rates to which Hawtrey attached such importance. As interest rates rose and prices for exports fell, merchants scaled back purchases and the result was a recession as output fell and unemployment rose. Export trade stalled. But the hiatus in trade was short-lived. Demand for British goods overseas continued to trend upwards, prices and profit margins recovered, and once the glut in the market had cleared, merchants again began to fund orders on credit and sell goods abroad and the economy rose out of slump into boom. *This, contend Gayer et. al., was the basic cyclical pattern in the first decades of the nineteenth century.* In the second half of the nineteenth century the inventory cycle faded from view as British exports became more diverse and included more heavy industrial capital goods. *The cycle, now, reflected the flux of orders in overseas markets due to the business cycles within the receiving markets* – such as the American building cycle highlighted by Coppock or the European business cycle. The export cycle was now of greater length, extending, as a consequence, the British business cycle to 7 or 8 years.

- iii. *What was the role of Investment in the cycle?* The basic effect of investment spending, it is widely contended, was to exaggerate and elaborate the effect of export fluctuations. As exports increased, firms began placing orders for capital goods as they approached capacity constraints. Further, the multiplier effects of increased export spending led to a general propensity to invest across the economy on the Accelerator principle. By this means growing export demand led to rising incomes and growing demand for capital, the construction of which in turn further fuelled the expansion of output and incomes. Just as capital investment reinforced the booms, so it compounded the slumps as capital projects characteristically came to fruition at or just after the peak of domestic activity, worsening over-production and pushing down prices, profits, and employment. *Upon this interpretation capital's role in the business cycle was more a dependent than an initiating one* – it reflected and reinforced the cycle, rather than causing it.
- iv. *Is there a case for investment playing a more active role in the cycle?* Undoubtedly there is. On some occasions capital investment contributed more directly to the observed cycle. R.C.O. Matthews believes this is true of the cycle of the 1830s, when it was investment fuelled by the rise in company profits and stimulated by the new railway technologies, rather than export demand, that led the recovery of 1833. More generally, investment overseas had the capacity to increase exports through the demand it generated for British products. Cairncross was a proponent of this view, noting that, with the exception of the boom of 1900, all 'other booms from 1870 onwards seem to have been communicated through the export trades from America and other centres of investment.'<sup>1</sup> *However, the strength of the link between overseas investment and exports was always weak and declined over the nineteenth century as rival centres of production emerged* – and in so far as foreign investment took place at the

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<sup>1</sup> Cairncross, *Home and Foreign Investment*, p. 196.

expense of domestic investment there would have been a dampening effect on British expenditure.

- v. *What was the role of money supply and interest rates?* The behaviour of money supply and interest rates suggests they played some part in generating the UK cycle. Money interest rates were generally low at the commencement of the cycle and this may have encouraged merchants to expand their operations in the manner Hawtrey described. Low money interest rates probably also boosted confidence – as in Pigou’s model of the cycle. Ample bank reserves encouraged the discounting of commercial bills at low rates of interest and bank loans were more readily available. Low interest rates also encouraged overseas issues and this stimulated external investment and so exports. As the recovery proceeded money supply grew as credit was extended and banks discounted the greater number of bills being issued. But as banks found their reserve ratios under pressure the money market started to tighten and market interest rates increase. Bank of England Bank Rate tended to rise also as increasing domestic demand pushed the Balance of Payments into deficit, causing gold reserves to fall. Raising Bank Rate was a means to attract more gold into Britain and of slowing the drain of currency into domestic market through the discount of bills. Thus, market interest rates and Bank Rate tended to rise in the later stages of the recovery and this had the capacity to bring the growth of output to a halt – by putting pressure on merchants who relied on credit to fund their activities, and by signalling to investors a future of greater financial stringency. Overseas issues would decline and businesses would find it harder and more expensive to discount bills. *Whether this rise in interest rates was the leading factor pushing the economy into recession is considered doubtful.* Fluctuations in merchant inventories, while important in the early nineteenth century, became less significant as the economy matured. The link between interest rates and exports was weak, as was the link between interest rates and investment, since most capital investment was funded out of profits. Indeed, investment characteristically peaked at or even slightly after the high-point of the boom, when interest rates were already rising. Most important, the discussion of the relationship between interest rates and the cycle is couched almost wholly in terms of money rates of interest. If we take into account inflation, then real rates of interest were actually historically high at the commencement of the recovery since even if money interest rates were falling, prices were usually falling faster, raising real interest rates. By contrast, real interest rates, although often rising in the mid-stages of the boom, usually fell towards the end as inflation accelerated and outstripped the rise in rise in money rates – though of course how far contemporaries were able to distinguish between real and money interest rates is unclear in an age when inflation data was not available.

To summarise. It is generally agreed that there was a business cycle in nineteenth century Britain because expenditure fluctuated, rising strongly at some points and falling at others. Expenditure fluctuated primarily because export demand and investment spending fluctuated. Exports fluctuated because of an inventory export cycle in the first half of the nineteenth century and because of the cyclical behaviour of export markets in the second



half of the century. *As such, the export cycle began as an endogenous variable and became an exogenous one.* That is to say, whereas the export cycle of the first decades of the nineteenth century was generated by characteristics of the British economy, the cycle from the 1850s onwards reflected fluctuating conditions in foreign economies. To this extent Coppock is right to call the Juglar Cycle of the later nineteenth century a *pseudo-cycle* as it was a product, not of cyclical tendencies within the British economy, but of contingent circumstances in global markets. *Variations in investment appear to have been endogenously generated* – the main factor being the process of recovery from the previous slump. Once a recovery was underway profits would accumulate, demand would rise, prices would increase, real interest rates would be low and falling, and optimism would raise the anticipated marginal efficiency of capital. All these developments stimulated increased investment, boosting the economy – but eventually helping to push it into recession as the delayed fruition of productive investment coincided with the tipping-point of the economy. So: *there was a business cycle because there was an export and an investment cycle.* Although each was partly independent of the other, there was an important degree of synergy between the two, with causality more usually running from exports to investment. But even if exports took the lead in shaping the timing of the cycle, fluctuations in investment were at least as important in determining its contours.