III

INVESTMENT AND THE GREAT DEPRESSION

'I am never weary of preaching in the wilderness "the only very important thing to be said about currency is that it is not nearly as important as it looks".'—ALFRED MARSHALL.[1]

I

THE period from 1873 to about 1896 has been known in economic history as the Great Depression. Although the trade cycle ebbed and flowed through these years, they were characterized by a set of persistent secular trends. Among these were a fall in industrial profit margins and in the rate of interest as measured by the yield on fixed-interest securities, by the yield on industrial equities, by the rate at which new floatations were made. Industry and finance were conducted in an atmosphere unsatisfactory to entrepreneurs and to many of Lombard Street's operators. 'The classes who have the most ample opportunities of proclaiming their grievances' felt 'a great social distress'.[2] Royal commissions on the depression and on gold and silver sought the causes and possible remedies for the situation. The almost continuous fall in prices, a proximate cause of reduced profit margins, was widely analysed and prescribed for by politicians, economists, men of business and finance.

It was immediately recognized, however, that the Great Depression was not an extended cyclical contraction. Output and real wages continued to move upwards at impressive rates. Marshall, the *Economist*'s editors, Giffen, both sets of royal commissioners, and most other serious commentators were aware of the limited meaning that could be attached to the word 'depression' in this context. Nevertheless the appellation has stuck. Historians are aware that output rose, and that real wages advanced rapidly, but the aura of discontent remains.

Mr. H. L. Beales, in the *Economic History Review* of October

[1] *Memorials to Alfred Marshall*, 1925, p. 375, in a letter to James Bonar.
[2] R. Giffen, *Essays in Finance*, 'The Liquidations of 1873–6', 1882, p. 119.

1934, did much to dispel some of the haze which still overhangs the period.[1] He emphasized once again its highly progressive character and the extent to which the term Great Depression is a misnomer by standards of output and real wages. There is no further need to pursue the unhappy phrase, or to give the lie to the melancholy entrepreneurs and bimetallists of the eighties. The Great Depression was not a depression. But what was it?

A reading of the *Economist*, the *Bankers' Magazine*, and the evidence and reports of the royal commissions reveals a set of secular trends affecting every section of the economic system: a widening gap between the Bank and money-market rates, a fall in all rates of interest, a fall in equity prices, a shift in the direction of long-term investment away from foreign towards home channels, a fall in profit margins and prices, an increase in output and real wages. These are the facts the economist-historian must attempt to relate and explain. They dominate the years from 1873 to 1898. But they are all evident by 1886. The data in the following account will be drawn mainly from the period 1873–86.

Explanations of the Great Depression have been determined by competing analyses of prices:[2] the monetary analysis and the approach through supply and demand. From the first, causal emphasis has depended on the method employed. The monetary perspective viewed prices as a fraction relating 'money' and 'commodities'. The fall from 1873 to 1886 was explained as an increase in 'commodities' with the amount of 'money' stagnant.[3] Money theorists pointed to a failure of the gold stock to increase at its previous rate and to the large new gold demands that accompanied the widespread movement to a single standard. They never investigated in detail the process whereby a gold shortage might have affected individual prices: they never ascertained whether bank deposits, the most important part of the circulating

[1] 'The "Great Depression" in Industry and Trade', pp. 65–75.

[2] For a more detailed discussion of explanations of the Great Depression, see below, Chapter VII.

[3] For a diagrammatic representation of this view, Sir R. Giffen, *Economic Inquiries and Studies*, 1904, vol. i, p. 214, 'Recent Changes in Prices and Incomes Compared'.

medium, showed the assumed contraction.[1] Occasionally they would be forced to admit that the mechanism of the money market and the interest rate must have been called into play if a gold shortage were to reduce prices.[2] But they remained, whenever possible, on the level of quantity theory homilies. Analyses of this type usually emerged with causal emphasis on the gold question and bias towards bi-metallist remedy.

The approach through supply and demand was an extension to general prices of the conventional analysis of an individual market. Its advocates mustered enormous evidence attesting to new methods and machines, cheapened transport costs, new raw material sources, and increased competition. They tended to deprecate the alleged monetary forces. They insisted, in short, that individual cost curves had fallen far and shifted to the right: that the average cost of producing a given output had decreased, and that diminishing returns—rising marginal costs—set in at a further point, requiring a higher level of demand to yield rising prices. They found in the case of each market no residual movement to be explained after its unique conditions were examined.[3] No monetary factor was required. Their motto might have been Marshall's: 'Gold has behaved very well.'[4]

Since the eighties there has been little advance in the analytic literature relating to this problem. The accepted view, if it can be defined, is one which combines but does not

[1] J. T. Phinney, after examining the influence of gold on prices through the banking system as assumed in the arguments of Hawtrey, Kitchen, Cassel, and Layton, concludes: 'Between variations in gold production and variations in the rate of growth of the most important part of the circulating medium, there seems to be almost no correlation that is assumed by all studies of the problem of price trends that deal in terms of gold and prices alone' ('Gold Production and the Price Level', *Quarterly Journal of Economics*, 1933, p. 677).

[2] P. B. Whale has pointed out that the two 'crucial' assumptions underlying the classical view of bullion movements were that general changes in incomes and prices only occur as a result of changes in the volume of circulation; and that such changes are brought about by changes in discount rates and thus changes in the process of saving and investing in particular countries. ('The Working of the Pre-War Gold Standard', *Economica*, 1937, pp. 18–19.)

[3] The account of D. Wells (*Recent Economic Changes*, 1889) was of this type. See also N. Pierson, *Principles of Economics*, 1912, vol. i, pp. 384–94, for an analysis of Wells's method and application of it to the silver question.

[4] *Memorials*, p. 68.

relate the two explanations given above: prices fell because of cheapened costs and foreign competition, but there was a 'monetary factor'. The accounts of Lord Layton and Mr. Crowther, of Prof. Clapham, of Prof. Cole, of Mr. Beales fall into this category.[1] These are directly in the line of the *Economist* and Marshall. Both stressed the increased productivity of industry as the primary cause, but added that the gold shortage was 'felt a little in the Bank parlour'.[2] Marshall gave a slightly larger place to gold than the *Economist*, which attacked any explanation which assigned to it more than a slight frictional importance.

An examination of the weekly reports reveals that the money market was well insulated from such pressure as foreign demands for bullion might have exerted on the Bank rate, and that the movements of long-term capital supply and demand can be explained without reference to forces emanating from the short-term market. None of the major characteristics of the Great Depression can be traced to a restricted response from the banking system. The prevailing tendencies in the short-term capital market, on the contrary, were towards abundant supply, with rates insensitive to changing demand conditions, and a restricted demand in several important branches—notably inland bills and Stock Exchange speculation. This fact, and a variety of institutional developments, seem to account for the gap between Bank and market rates. Neither the bullion shortage thesis nor more explicit propositions about the supply of loanable funds can be employed effectively to explain the secular fall in commodity prices, interest rates, and equity prices; nor can they account for the peculiarly depressed outlook of entrepreneurs, their complaints of over-production, or the failure of prosperity in the early eighties to attain as high a level of employment as that a decade earlier.

The bias of economic theory until the development of general income analysis, in the late 1930's, had focused

[1] W. Layton and G. Crowther, *An Introduction to the Study of Prices*, 1935, chap. viii, pp. 81–102; J. H. Clapham, *An Economic History of Modern Britain*, vol. ii, pp. 338–9; G. D. H. Cole, *British Trade and Industry, Past and Future*, 1932, chap. v, pp. 77–97; H. L. Beales, op. cit., especially pp. 74–5.

[2] *Official Papers of Alfred Marshall*, 1926, p. 128; *Economist*, 1885, p. 687.

attention on the price problem as something apart. Current analyses of output as a whole tend to distribute emphasis differently. Price movements are considered as a result of logically more profound changes in the system. General theories promise an explanation that relates the capital markets to the commodity markets. They give access to price and production problems 'without finding ourselves sometimes on one side of the moon and sometimes the other'.[1] The framework of general theories seems to resolve the dilemma of the dual approach to prices which has persistently harassed commentators on the Great Depression.

Keynes set forth the conditions of supply under which the quantity theory would hold in the short run, as follows:[2]

> . . . assume (1) that all unemployed resources are homogeneous and interchangeable in their efficiency to produce what is wanted, and (2) that the factors of production entering into marginal cost are content with the same money-wage so long as there is a surplus of them unemployed. In this case we have constant returns and a rigid wage-unit, so long as there is any unemployment. It follows that an increase in the quantity of money will have no effect whatsoever on prices, so long as there is any unemployment, and that employment will increase in exact proportion to any increase in effective demand brought about by the increase in the quantity of money . . . the Quantity Theory of Money can be enunciated as follows: 'So long as there is unemployment, employment will change in the same proportion as the quantity of money, and when there is full employment, prices will change in the same proportion as the quantity of money.'

He then modifies the formal assumptions under which this would hold with a series of observations about actual markets, concluding:

> . . . the increase in effective demand will, generally speaking, spend itself partly in increasing the quantity of employment and partly in raising the level of prices . . . we have in fact a condition of prices rising gradually as employment increases.

[1] J. M. Keynes, *The General Theory of Employment Interest and Money*, p. 292. See Chapter I for an extended discussion of the relation between the cast of various modern theories and explanations of the Great Depression.

[2] Ibid., pp. 295–6.

This structure links the monetary and supply-demand analyses of prices. The shape of short-run supply curves forces modification in the concept of a price rise proportional to the monetary increase. Keynes indicated the complexity of the problem by tracing in detail the price consequences of increased monetary demand under alternative conditions. The importance of the elasticity of supply (i.e. the extent to which increased output necessitates higher prices) emerges from this argument, as it does from the later exposition of Mr. Haberler.[1] But movements in the cost unit are not simple, nor do they lend themselves to general dogmatic statement.

The Keynes theory of prices proceeded under the assumption of a fixed state of equipment and technique. A purely short-period view, however, is not appropriate to historical analysis. It is of the essence of investment that it change the state of resources, equipment, and technique. The construction of new equipment is indeed time-consuming. The inauguration of a piece of investment does not coincide with its amalgamation into the capital stock of the system, and this has obvious importance. It is, nevertheless, unsatisfactory to assume that the period of gestation is always longer than the cycle, or even half the cycle: that the investment of one cycle or expansion only effects supply curves in its successor. 'If we assume a sufficient interval for the quantity of equipment itself to change, the elasticities of supply will be decidedly greater eventually';[2] 'eventually', that is, the Marshallian long period, certainly falls within the range of the time period under discussion.[3]

In the present investigation of the relation between investment and prices, supply and demand conditions in the markets where particular prices are determined will be observed. In so far as possible the sources and shifts in demand will be investigated, and related, where feasible, to the direction of new investment; the state of supply (i.e. the shape, position, and movement of particular supply curves) will be similarly related to previous investment, whether

[1] G. von Haberler, *Prosperity and Depression*, 1937, pp. 186, 209, 255–6, 267, 282–3.

[2] Keynes, op. cit., p. 300.

[3] See above, Chapter II, pp. 52–3.

within the same cycle or its predecessor. A satisfactory account of the Great Depression demands a focusing on the relation between the character of investment and prices. Changes in costs, demand, and investment have received much discrete historical attention. Any claim advancing the discussion must arise from a study of their interconnexion.

An increase in investment affects costs in two ways. First, even in the relatively short period, the increase in the effective quantity of money tends to bring into play inelasticities of supply. The considerations enumerated by Keynes may make for rising prices almost from the outset of recovery, and certainly in its later stages. In cyclical analysis the fact of rising prices at some stage in the course of most periods of expansion has caused great attention to be given to the effects of new investment on demand. Second, in the long period—'eventually'—investment tends to lower costs. If a strong secular downward movement in prices seems to run through cyclical fluctuation in employment and output, if one cannot establish the existence of chronic depression, a prima facie case exists for the long-run influence of investment on costs and prices.

In general, the extent to which prices rise in any period of expansion depends on the relation between the rates at which supply and demand schedules shift and change their shape—the extent to which resources and fixed capital equipment have been expanded and are being expanded and the monetary demand increased. Factors affecting both supply and demand may be influenced by the character of the new investment supporting expansion. For Britain in the latter half of the nineteenth century a world-wide railway boom was likely to produce a greater rise in prices than a boom depending on more widely spread channels of internal enterprise. On the side of demand large-scale rail-iron orders created almost immediately rising prices in that industry. They also placed great pressure on the iron and coal-mining trades, where output was subject to severely decreased returns as full employment of labour and immediately workable mineral deposits approached. Capital goods' prices and the general level moved up rapidly as the peak came close.

On the side of supply new railroads did little in the course of expansion to reduce costs, although when built they helped substantially to reduce the element of transport cost in the price of British imports.[1] Other types of cost-reducing investment might be pursued in a boom thus inspired, but their effects would almost certainly be countered by the heavy pressure on inelastic supplies of capital goods.

In a boom less singly inaugurated, in which new investment followed several directions, involving some reduction of costs in the relatively short period, different price results might be expected. The spreading of initial demand through a large number of channels would tend somewhat to put off the appearance of 'bottle-necks', or at least those inelasticities associated with a sudden and large-scale increase of orders in a single branch of trade. The fact that individual units of new investment would be smaller and capable of being postponed would probably make for more elastic demand schedules, and a less easy road to higher prices. A rise in price was more likely to lose customers if they consisted of a dozen joint stock companies and local corporations in Britain, than a single optimistic railway contractor operating in the United States or Russia. Railway builders are at the mercy of their original decision to construct. A very great change in prices or expectations is required to persuade them to halt. But when capital goods' demand arises in small orders, for smaller units of investment, the total demand will almost certainly be more sensitive to upward price revisions. Finally, the fact that the average period of gestation of new investment would be shorter would make it more difficult to maintain the phase of optimism before expectations were belied.[2] It would tend as well to lower costs even within the compass of the expansion period.

This analysis is by no means a complete explanation of the disparity of price movements in the two booms, 1868–73 and 1879–83. It provides, however, a rough framework for more detailed inquiry.

[1] See Layton and Crowther, op. cit., pp. 89–90, on the manner in which American railway building affected the price of wheat.

[2] A. C. Pigou, *Industrial Fluctuations*, 1929, pp. 90–2 and 230.

Assuming constant tastes and money incomes, an end to wars, a stable population, and no new lands to be developed, one would expect to find an economic system in which prices fell steadily in response to intensive cost-reducing investment. An assumption of this kind underlies Mr. Durbin's conception of equilibrium.[1] It is reasonable that the placid community garner the rewards of its abstinence (ignoring the effects on saving of a fall in its price) in a rising state of welfare achieved through ever lower prices.

Entrepreneurs and financiers in this community, however, could be counted on to complain bitterly of their position. The expected yield on new investment would fall, dividends would drop, and Stock Exchange operators might find it difficult to arouse interest in speculation. Fixed capital would be re-valued downward. One might expect also an appearance of the bogey of over-production. Optimum output would be at a constantly further point. The amount of output produced under decreasing costs would increase. Should this relative growth in the proportion of fixed capital be world-wide, the atmosphere of over-production would be accentuated, trade restrictions encouraged. The elasticity of demand curves for home products would increase with the efficiency of foreign competitors: the British producer would have over him constantly the threat of orders transferred abroad if prices were raised. Barring monopoly tactics competition within the country would also become more severe. If output continued to fluctuate cyclically the long-term tendency to falling prices might dominate periods of expansion as well as contraction. Normal inelasticities of supply and expectations of them would operate against forces which might, in net, yield stagnant or even falling prices in a boom.

These cryptically stated hypotheses will be tested against the data of the Great Depression. Corroboration will proceed

[1] *What Everyone Wants to Know about Money* (edited by G. D. H. Cole), chap. vii, pp. 253–79 ('Money and Prices'). See also Keynes, op. cit., pp. 306–9. The assumption that the rate of interest will necessarily fall in a stationary state has been in recent years a subject of much controversy. The proposition has been by no means universally accepted. It conforms, however, to the view taken here of the Great Depression; and has been therefore employed as a background for the historical exposition.

along two lines. The extent to which new British capital investment shifted from foreign to home channels will be examined, and its partial analogue in the reduction of costs in various of the principal industries. These sections will not give a consecutive historical account, but will attempt to evaluate the net changes in the first decade of the period. The relation between investment and prices will then be traced through the cyclical phases from 1868 to 1886.

II

Statistics of new capital issues and of joint stock enterprise supply by no means complete data of new investment. Capital goods' production indexes are perhaps the best indicators for cyclical analysis. Total capital estimates, such as Mr. Paul Douglas's compilation,[1] are useful in judging long-term movements. The figures for new issues and company floatations do, however, usefully suggest the direction investment is taking, as well as its relative increase and decrease. The years 1870–5 and 1880–5, 1873 and 1883 are approximately comparable phases of cyclical movement. The relative amounts of new British enterprise at home and abroad are roughly revealed by the following figures:[2]

(*Statistical abstract*) *Average annual number new joint stock companies registered*		(*1900 = 100*) (*Beveridge*) *Average annual capital per head new joint stock companies registered*		(*Hobson*) *Average annual capital issues in U.K.*	
1870–5	1880–5	1870–5	1880–5	1870–5	1880–5
21·6	31·2	55·9	92·6	18·7	23·6

(*Hobson*) *Average annual capital export*		(*Douglas*) *Relative total capital invested overseas*		(*Douglas*) *Estimated total capital in U.K.*	
1870–5	1880–5	1875	1883	1873	1883
176·5	82·1	55·4	62·7	58·9	76·6

[1] 'An Estimate of the Growth of Capital in U.K., 1865–1909', *American Journal of Economic and Business History*, Aug. 1930.

[2] All figures have been reduced to 1900 = 100. Sir William Beveridge, *Unemployment*, 1930, pp. 42–3, col. 6. C. K. Hobson, *The Export of Capital*, 1920, p. 223. P. Douglas, op. cit., pp. 679–80.

However inaccurate these statistics may be, however limited the area of new investment they may cover, however dubious any quantitative statements drawn from them, they do attest to a shift away from capital export towards new investment at home.

The changed direction of investment was, quite consistently, accompanied by a fall in rates of interest. Labour-saving machinery is not generally expected to yield as high a return as railroads or gold mines. This is indicated by the following figures:[1]

	Rate on bankers' best three months' bills	*Yield on Consols per cent.*	*Index of fixed-interest securities prices (1900 = 100)*	*Index of industrial securities prices*
1873	4·70	3·24	81·5	84·3
1879	2·14	3·08	85·5	58·0
1883	3·22	2·96	91·5	61·8
1886	2·33	2·97	93·0	58·7

The money rate showed some cyclical fluctuation; the Consol rate was influenced from 1883–6 by special factors affecting government credit; the advantages of a fixed yield increased steadily; industrial dividends, actual and expected, fell with important interruption only in the short-lived speculation of 1879–80. Generally the evidence attests overwhelmingly to a fall in the abstraction called the rate of interest.

Giffen had said in the seventies: 'In the course of time, if the taste for foreign investment does not revive, the capital and labour employed in making articles for export will be turned to the production of articles for consumption and investment at home.'[2] The changed direction of investment was in fact accompanied by a rapid refinement in the capital structure of British industry; while the rail makers, who had benefited so largely from the capital exports, were forced to

[1] The rate on three months' bills is from A. C. Pigou, op. cit., p. 399; the yield on Consols is calculated from the annual average price; the securities' indices, with the base year shifted, are those of K. C. Smith and G. F. Horne, 'An Index Number of Securities, 1867–1914', Memorandum No. 47 of the Royal Economic Society, June 1934.

[2] Op. cit., p. 121. Although exports continued to rise the balance of trade was immediately sensitive to the decrease in capital export, fulfilling the true sense of Giffen's prophecy.

look to other lines. New machinery, methods, and supplies of raw materials created a virtual revolution. The pressure of falling prices, the increase in foreign competition, the abundance and cheapness of funds should all have tended to encourage capital export. But the failures of the middle seventies had eliminated many of the most important borrowers, while lenders grew cautious. The market for high-risk foreign issues all but disappeared. A graphic, though extremely crude, indicator of the direction which new capital investment was taking are the *Economist* advertisements. The last pages of each issue were devoted to the seduction of the investor. In 1873, bonds for the Turkish Government, waterworks for St. Petersburg, railroads for Montevideo, banks for Mexico, gold mines for Peru were in order. By the eighties new steam-engines, three-furrow ploughs, insurance companies, Appleby's cranes and engines, Bush's concentrated fruit essences, Smith and Coventry's labour-saving machine tools, and Galloway's boilers command the stage.

The secular development of savings institutions and habits, aided by the rise in real incomes, helped the home investor. Funds were easily available for safe ventures. The daring of investors varied, of course, with the stage of the cycle, but the experiences of 1873–7 seem to have chilled issuing-houses and private lenders to the exciting types of foreign securities which had dominated 1870–3. Such new foreign issues as appeared were for more stable governments (there was a decided shift towards colonial investment, especially in Australasia) at steadily falling interest rates. The character and means of investment were described by Goschen in 1885:[1]

> Those gentlemen (the bimetallist inflationists) have their wish now in a certain sense. They have capital at two per cent. There seems to be no dearth of capital. . . . With regard to cheap money . . . it appears to me it is not only the traders and the manufacturers who are complaining (because of falling prices and profit margins), but that other capitalists find it exceedingly difficult to find a good return for their capital. The colonies are borrowing at four per cent. and less whereas they used to be

[1] *Addresses on Economic Questions*, 1905, pp. 198–200, 'The Prospects of Trade'.

borrowing at six per cent. Corporations are borrowing more cheaply than they were ever able to borrow before. The borrowers, steady borrowers, sober borrowers, have an extremely good time of it, and what is the meaning of this cheapness of capital? I think it means that the savings of the country have gone on increasing, while there has been more prudence in selecting the securities into which they were put. Foreign loans used to carry off a large portion of our savings, but the Income Tax returns show that the profits derived from foreign securities have scarcely increased during the last few years. Savings are being used in another way. Never before has there been so keen a desire on the part of the whole community to invest every reserve shilling they may have in some remunerative manner. There is a competition between men who have a few tens of pounds and a few hundreds of pounds to put them into business, and into business they are put. Joint-stock enterprise has swept up all these available resources. Like a gigantic system of irrigation it first collects and then pours them through innumerable conduit pipes right over the face of the country, making capital accessible in every form at every point.

The fact that investment showed a tendency to turn inward during the Great Depression might be expected to have ramifications on the supply-demand conditions of specific markets. On both sides, it will appear, there were forces making for lower prices: cost curves shifted down and to the right, demand curves for particular firms and British industries became more elastic. A given output could be more cheaply produced, home and foreign competition became increasingly severe. Two sets of questions will be asked of the data. First, over a period of years, did the expected secular trends exhibit themselves in specific markets? Can those trends be associated with the shift in the direction of investment which has already been established? Second, can the characteristics of the cyclical phases 1868–73, 1874–9, 1880–3, 1884–6 be similarly related to the type of new investment pursued and to the effects on industry of this investment, previously investigated over a longer period?

It is unnecessary to recount at length the technical development in British industries during the seventies and eighties. Economic historians have told its story fully as an institu-

tional development. It is important here to select evidence from the more important industries to illustrate the character of the process. To that end the iron, coal, and cotton trades will now be examined.

Changes in the demand for British iron and steel in the decade following 1873 may be summarized as follows:

1. A decreased demand for rail-iron and rail machinery, except from the colonies and South America.
2. An increased demand for the building of machinery and ships.
3. A moderate net increase in foreign demand for iron and steel generally.
4. An enormous increase in the demand for steel.

It was Clapham's opinion that 'the remarkable maintenance of the output of puddled iron during the decade 1873–83, in face of competition from the continent and the open hearths, and in spite of the abandonment of iron railway by all great companies before 1879, was due principally to a great expansion of the demand for iron plates and angles in ship-building'.[1] This development is illustrated by the production figures from a group of malleable-iron producers in the north-east:[2]

(*In thousand tons*)	*Plates*	*Angles*	*Bars*	*Rails*	*Total*
1873 . . .	166	44	79	324	613
1876 . . .	172	53	88	108	421
1878 . . .	234	88	78	22	422
1880 . . .	317	93	71	27	508
1883 . . .	440	134	81	3	658

Total railway-iron and steel production did not fall everywhere to this disastrous extent. Although the intervening years were dark indeed, there was an increase in railway metal produced from one cyclical peak to the next, from 897 thousand tons in 1873 to 1,051 in 1882.[3] Since the price

[1] Op. cit., p. 61. See also Sir Lowthian Bell, Statement Relating to the Iron Trade, *Second Report, Commission on Depression*, appendix A, p. 330 (pamphlet, p. 42). Bell's statement appeared originally as a pamphlet. Page-numbers of the pamphlet are given in the minutes, enabling more precise reference.

[2] Bell, op. cit., p. 18.

[3] Ibid., p. 27.

of iron fell 60 per cent. in this decade, money earnings from the production of rail-iron were much decreased.[1]

The growing importance of machinery to the iron trade is shown by these figures of the comparative value of machinery production:[2]

(*In £ millions*)

	%
1873	10·0
1879	7·3
1883	13·4

If a rough price corrective is applied (Sauerbeck minerals index, 1900 = 1·00), they become:

	%
1873	7·6
1879	10·8
1883	19·8

Bell commented that 'these figures justify the assertion that the engine and machine builders are very important customers of our iron works . . . and that the use of iron is extending into those requirements of life which are, it may be expected, less liable to those excessive fluctuations which have marked the progress of railways'.[3]

Total British export of iron and steel (including machinery reduced to terms of pig bars) was 3·9 million tons in 1873, 5·6 in 1882.[4] At the bottom of depression, in 1878, the total was 3·0. Of this amount there was a general evenly spread increase of about 0·4 million tons in the sale of iron and steel pig-iron bars to industrial nations. In the purchase of manufactured iron (railroad, bar, angle, bolt, and rod) a remarkable shift occurred in which the colonies, South America, and other semi-developed areas superseded Germany, France, Belgium, Russia, and the United States as Britain's most important customers.[5]

[1] The prices of iron fell as follows:

	Cleveland pig	Haematite
1873	109*s.* 2*d.*	156*s.*
1883	43*s.* 5*d.*	56*s.* 7*d.*

[2] Bell, op. cit., p. 27. These figures include machinery produced for export as well as home consumption.

[3] Ibid., pp. 22 and 155.

[4] Ibid., p. 28.

[5] Foreign trade supplements of *Economist*, January of each year.

From 1878 on, steel became increasingly important in the shipbuilding industry.[1] At the same time steel was superseding iron as rail material.[2] The substitution of steel for iron had, among others, these two effects on demand: steel competed successfully in many uses with malleable iron; the longer life of steel rails made, over a period of time, for a relative fall in rail replacement orders.[2] The production of steel by the basic process rose from 20 tons in 1878 to 179,000 tons in 1884; while the difference between Cleveland and imported haematite iron prices fell from 21*s.* 5*d.* to 7*s.* 11*d.*[3] The consumer of steel owed much to Messrs. Gilchrist and Thomas. Steel rails, which had been sold for £12. 1*s.* in 1874, were marketed for £4. 5*s.* ten years later.

In the iron industry, as elsewhere, there were also numerous economies through the use of new methods and machines. Bell concluded that 'the improvements which have been applied to production are such that it is difficult to compare costs with those of former times. To produce a ton of pig something like 20*s.* only is expended in wages':[4] and wage rates rose or were maintained. I. T. Smith estimated that 'the labour on a ton of rails is not half what it was when we first began to make rails'.[5] In finished as well as intermediate iron products this trend is evident. In the manufacture of steel files, for example, cutting machines were introduced, requiring two skilled operators, throwing out of employment six to eight men, who, 'instead of working as skilled artisans, became labourers'.[6]

While this revolution in the techniques of production proceeded in Britain, world output was expanding rapidly. The relative fall in British foreign lending did not check the growth of capital-goods industries elsewhere. The United States, Germany, Belgium, and France all tended to free themselves from dependence on the British semi-monopoly of the early seventies. In 1873 Britain produced 44·7 per cent.

[1] Bell, op. cit., pp. 20–4.
[2] Idem.
[3] Ibid., pp. 17 and 24.
[4] *Second Report, Commission on Depression,* 1955–9.
[5] Ibid., 3648.
[6] Ibid., 1156–81, 1198–1204, 1274–82 (S. Uttley), and 1448 (J. Dixon).

of the world's pig-iron, in 1883, 40·5 per cent.; British production for 1873 (1870 = 100) was 110·1, 154·9 for the world—in 1883, 143·0, 239·1 for all other countries.[1] Although British iron exports continued to rise in quantity, although Bell could proclaim England 'still without peer as a producer of iron and steel',[2] the semi-monopoly days of 1871–3 were over, and the profit margins that had accompanied them. The threat of foreign competition, and the occasional appearance in Britain of German cutlery or German girders, was sufficient to warn producers that costs must be cut and prices kept low if their share of world production were to be maintained.[3]

More generally the significance of the world extension of facilities lay in the resultant increased elasticity of supply. The boom of 1871–3 had stimulated the opening and extension of iron works. This 'undue extension', wrote Bell, 'justified, perhaps, at the moment, over a term of years, was more than the world required'.[4] Full employment of resources became harder to attain. Price-cutting resulted wherever price-fixing did not.[5]

Although wage-rates in the iron industry actually rose in this decade,[6] iron producers were relieved by the steady fall in the price of coal. Sauerbeck's index number for the price of coal was 145 in 1873, 82 in 1883.[7] A third of the coal output was consumed in iron production. The latter industry was extremely sensitive to price movements in coal.[8] A 44 per cent. drop in its price facilitated the difficult transition

[1] Bell, op. cit., p. 58.
[2] *Second Report*, 2371 and 2373.
[3] Bell, op. cit., pp. 62–4, and *Second Report*, 2369 (I. T. Smith).
[4] Bell, op. cit., pp. 165–6. Speaking of excess capacity, T. E. Vickers said (*Second Report*, 3533–4), 'the duty in the past has fostered the building of these works, these works are there, and must be kept going. 3533. At a profit? At a profit or no profit, they must be kept going.'
[5] For classic testimony on the factors making for monopoly see I. T. Smith's statements on the international rail ring, *Second Report*, 2271–89. The impulse arose in this case from the existence of excess capacity and cutthroat competition after the short American railway boom of the early eighties had ended.
[6] See Bell's testimony, *Second Report*, 3648.
[7] *The Course of Average Prices*, 1908, p. 65.
[8] For discussion of this relationship, see *Economist*, 1873, p. 187.

to new methods and new demand conditions in the iron and steel markets.

Foreign competition did not constitute a problem to the coal industry.[1] Even in neutral markets there was little perceptible opposition. Competition among British producers, however, was severe. Between 1871 and 1875, 1,401 new pits were sunk: 'The cause of depression, I think,' answered John Ellis,[2] 'is the large number of pits which were sunk immediately after that excitement' (1871–3). The element depriving coal-operators of their profit was 'a demand not so great or nearly so great as the supply in our district, and therefore the selling price is lower',[3] or, as one producer agreed, 'a competition between our coal producers to get rid of their surplus stock'.[4] The demand for coal increased steadily as the process of world industrialization proceeded. The rise in British coal production was only slightly interrupted even in the years of worst depression.

The expansion of iron and coal resources and improved techniques and labour efficiency applied helped to produce a fall in prices throughout the capital-goods industries. In each branch of trade this reduction was accentuated by its own technical developments. In many places machine tools superseded the skilled artisan. Machinery was sought as a means of escaping the tyranny of money wages that could not be reduced. Everywhere 'the growing depression stimulated invention of labour-saving devices'.[5]

The British cotton industry also underwent great technical improvement and expansion, yielding price-reducing competition and falling dividends.[6] Output of yarn rose (1900 = 100) from 76·7 in 1873 to 82·3 in 1883, piece-goods' exports from 69·2 to 90·2; the Sauerbeck textile index (1900 = 100) fell from 156·1 to 106·1 in the same years. As in the case of iron the rate of increase was slower than on the Continent

[1] *Second Report*, 3025–6 (J. D. Ellis).
[2] Ellis was chairman of John Brown & Co., and also chairman of the South Yorkshire Coal Association, ibid., 3002–16.
[3] Ibid., 3083.
[4] *Third Report*, 12, 310 (J. B. Simpson).
[5] Bell, *Second Report*, 2689. See also D. Wells, op. cit., pp. 364–70.
[6] For good general statement, Wells, op. cit., p. 184.

and in the United States. The proportion of cotton consumed is given by the following figures:[1]

	Great Britain	*Continent*	*United States*
1871–5 . .	47·2	32·9	19·9
1881–3 . .	39·9	35·9	24·2

Within Britain, as well as abroad, capital was pouring into new ventures. Three hundred and seventy-three new cotton companies, with a nominal capital of £20·4 million, were floated between 1873 and 1883.[2] The many mills erected in the early eighties were built at a cost of from 20 to 30 per cent. less than those of 1874–5,[2] and thus competed more easily in home and foreign markets. New machinery and methods were widely introduced, to which (in the case of Oldham) Ellison ascribes entirely the reduction of costs and the possibility of profitable production at lower prices.[3] G. T. Jones estimated that money costs in the Lancashire cotton industry fell from 114·8 in 1873 to 84·6 in 1883, real costs from 108 to 106.[4] If a ten-year moving average is taken of real costs, the downward trend is more apparent than in the annual figures. In the decade 1870–80 Jones estimated that real costs fell at the rate of ½ per cent. per annum.[5]

In statements before the Royal Commissioners, cotton representatives universally attested to a chronic 'over-production'.[6] That output could only be sold at a falling price was the witnesses' chief complaint when pressed for definition. A consequent falling yield on fixed capital was accepted 'for the simple reason that it might have cost them (the operators) more to have stopped the works than it cost them to keep them going'.[7] There is little doubt that the supply curves of the British cotton industry conform to the general pattern.

[1] T. Ellison, *The Cotton Trade of Great Britain*, 1886, p. 100. In 1882–3, however, Britain was still far ahead of any other nation in *per capita* cotton spun with 41·8 lb. per head; next was the U.S.A. with 18·7, and Switzerland with 17·30 (ibid., p. 147).

[2] Ibid., p. 135.

[3] Ibid., p. 139.

[4] *Increasing Returns*, 1933, p. 115.

[5] Ibid., p. 199.

[6] *Second Report*, see especially 4294–6, 4419–33, 4478–85 (S. Andrew and S. Taylor) and 5127–30, 5215–46, 5257–8 (J. Mawdsley) and 5314–15 (G. Lord).

[7] Ibid., 5229 (J. Mawdsley).

On the side of demand, the secular growth of real income produced steady increase. When the quantity of cotton exports were examined contemporaries found little of which to complain.[1] Severe competition was felt only in the case of the Indian mills.[2] American and German tariff barriers were a hindrance, and a growth of cotton industries within them. But in 1886, writing of sales abroad, Ellison was able to proclaim:[3]

> There is scarcely a nook or a corner in the habitable globe where the products of the spindle and looms of Lancashire do not find a market, although in some of the more civilised countries special efforts have been made to hinder, or altogether prevent, the import of British yarns and piece goods. The industry and ingenuity of our spinners and manufacturers, and the ability and enterprise of our merchants, have enabled them, more or less successfully, to compete with their rivals abroad, even where the latter have had the protection of exorbitant import duties; while in respect of the business done with the open markets of the world, Manchester almost monopolises the trade in cotton goods.

The answer to the dilemma of over-production lay, it was felt, in the opening up of China, Asia, and Africa, which, Ellison believed, might be 'a second India to Lancashire'.

This relative over-development of fixed resources can be traced to almost every large British industry—shipping,[4] paper, chemical, and textiles other than cotton.[5] Evidence before the 1886 Commission affirmed an increased amount of capital invested, a decreased net return, an increased volume of trade, a stagnant or proportionally lesser increase in the gross value of trade.[6]

[1] See, for example, Ellison, op. cit., pp. 149–62.

[2] For a more depressed picture of cotton in 1886, see *Second Report*, appendix A (6), pp. 368–9, in which T. Stuttard condemns the 'unscrupulous and barbaric' competition of Indian mills.

[3] Op. cit., p. 150.

[4] *Third Report*, 10, 065–9 (W. R. Price) and *Final Report*, p. ix. The fall in freight rates had, of course, important influence on the prices of all imports.

[5] See ibid., p. ix, for summary statement on paper, chemicals, and textiles.

[6] Ibid., pp. 123–9, where the evidence given before the Commission is summarized.

III

No attempt has been made to present here a complete historical account of British industries in the first decade of the Great Depression. It has been sufficient to indicate the extent to which developments in specific industrial markets are consistent with the general framework relating investment and prices. The chronicle of cost-reducing investment is far from complete; but it will have been sufficient here to show the shift to the right and lowering of supply curves: the shift to the right, but growing elasticity of demand curves facing particular firms and British industries. These meant, simply, falling prices and profit margins, despite rising output; and the rigours of severe competition.

Questions of monopoly tactics and the net effect of trade barriers have not been developed. They may be regarded, from this limited perspective, as an effect of economic developments, not a cause; although they did have significant consequences in several markets. But measured against the sweep of forces developing from 1873, they are of minor importance. They heralded, however, the beginning of the crystallization of British capitalism.

At the risk of some repetition the relation between investment, output, and prices will now be traced through short periods, in an attempt to answer the second set of questions addressed to the data. This analysis, including within it the pre-1873 boom, should give some insight into the essential differences between the periods of rising and falling prices. It may permit also a further isolation of the separate effects of investment on supply and demand schedules.

(Note: all statistics 1900 = 100, unless otherwise indicated.[1])

[1] The following material is drawn from a more detailed chronicle of events, constructed largely from the *Economist* and the *Bankers' Magazine* of which Chap. ix constitutes a portion. The price statistics are Sauerbeck's; the capital-goods, consumers' goods, and general-production statistics are from W. Hoffmann. 'Ein Index der industriellen Produktion für Grossbrittanien seit der 18. Jahrhundert', *Weltwirtschaftliches Archiv*, Sept. 1934, pp. 383–98; coal, iron, and textile production and export figures are from the Statistical Abstract for U.K. given in W. Page, *Commerce and Industry*, 1919, vol. ii; money and real wages are from Layton and Crowther, pp. 265–6; the unemployment figures are derived from Beveridge, op. cit., 883–98, pp. 42–3, col. 3.

From 1868 to 1871 output rose from 43 to 51, unemployment fell from 6·25 to 1·75 per cent.; but the general price index rose only from 132 to 133. Within the general index a tendency for the prices of minerals and other raw materials to rise is tempered somewhat by a fall in the food and textile indexes; nevertheless, until the second half of 1871 business widely reported large but unremunerative production. Recovery up to that point had encountered no serious inelasticities in supply and therefore produced no important price advances. Even the mineral index (weighted heavily with coal and iron) rose only from 79 to 86, despite a rise in iron and steel exports from 59 to 92, of pig-iron production from 56 to 74, of coal production from 46 to 52.

With the settlement of European peace a world-wide boom was launched. Orders poured into British works from every direction, at home and abroad. An almost classic case of full employment was reached in 1872–3. Bottlenecks appeared, especially in the markets for labour and coal. Unemployment was 1·65 per cent. in 1871, 1·15 per cent. in 1873, yet money wages had risen from 77 to 89; general production rose only from 51 to 55, while the general price index rocketed from 133 to 148. The mineral price index moved from 86 to 131, coal output, however, increased only from 52 to 56, pig-iron output was 74 in both years.

The rapid increase in demand (i.e. a shifting of demand curves to the right, curves which for British capital industries were highly inelastic) brought not only a rise in costs and prices, but also a reduction in productivity. In the crucially important coal industry new men were inefficient, and labour in general quite willing to abstract a part of its reward in increased leisure. There was, in addition, some tendency for work to become less efficient, even among experienced hands. This may account in part for the failure of output further to expand. Essentially, however, the large blocks of new investment, undertaken under independent but common impulse at the close of the war, were simply too much for British fixed capital facilities to bear.

Rising labour and raw material costs began to cut into the profitability of trade, both within the areas of industry

directly affected by the export boom and outside. Textiles, British railways, gas-works—outside the primary area—complained of narrowing profit margins, while only the temporary inelasticity of the export demand permitted the capital-goods industries to carry on (through higher prices) in the face of rising marginal costs. Early in 1873, before either of the great financial crises of the year, the turning-point in iron had appeared. In January, 'prices are rising for the present, but as new business is not active, the stronger tendency is due rather to a deficient supply than to increased demand'.[1] Puddling furnaces in the north and in south Wales were blown out in January and February; the demand for finished iron was 'not as good as expected' in April.[2] Export orders for finished goods were being held off in the hope of a fall in prices:[3] 'lower prices are still looked for and concessions continue to be slowly made. . . .' By the end of the year the demand for railway iron had fallen off sharply, the pressure on coal supplies had relaxed.

Reports from the capital industries during 1872–3 show that the inelasticity of coal-supply was, along with that in various labour markets, by far the most serious. Its effects were especially pervasive because of the iron industry's central position in the boom. The high prices of the latter stages of expansion, however, induced an enormous opening of new pits as well as an extension of operations to less productive coal veins. The danger of coal famine was removed for a quarter of a century. Expansion of plant in other branches paralleled on a smaller scale that in coal. Although foreign issues offered severe competition in the existing state of confidence, joint-stock floatations in 1871–3 were on a high level. The maintenance of internal prosperity, the immediate fall in the long-term rate, the incomes amassed in the previous boom all encouraged wide plant expansion in 1874–5. The great extension and technical improvement in cotton and metals came after 1873 rather than before.

The general price index fell from 148 to 110 between 1873 and 1879, general production from 62 to 60; unemployment

[1] *Economist*, 1873, p. 106.
[2] Ibid., pp. 74, 106, 204, 235.
[3] Ibid., pp. 726 and 788.

rose from 1·2 to 10·7 per cent. The increased productivity represented by these figures came in part from the greater efficiency of labour. Entrepreneurs did everything in their power to eliminate the laxity encouraged in the easy days of 1872–3. In part it arose from the extension and improvement of plant that boom expectations had helped stimulate. By 1879 many new cotton mills were in operation, new coal pits were producing, and despite a strong tendency for unit output to rise, the number of blast furnaces had increased (1900 = 100) from 147·6 (1873) to 153·0.[1] The boom had also brought with it new methods and machinery. The period of relative recession served only to accentuate the advantages of such labour-saving devices. These years clearly show a downward and outward shift of supply curves in the major British industries. The presence of excess capacity in the existing state of demand aided the movement to lower prices and lower returns on fixed capital. Increased output did not bring increased marginal costs.

The enormous orders of 1872–3, which had forced the system to full employment and virtually pure inflation, had come from abroad and had centred on the rail-iron trade. From 1873–9 that source of demand fell off heavily. Until the latter half of 1877 the engineering and shipbuilding trades helped maintain output. A building boom, instigated by a combination of large boom profits, a falling interest rate, and a profound distrust of new issues in the London market, gave secondary sustenance. The demand for engineering iron was strengthened by the building of new factories and a variety of local government projects. The index of capital-goods production actually rose from 55·3 in 1873 to 61·4 in 1877. The export demand in the latter stages of expansion had been accompanied by a relatively small increase in output. Ignoring, for the moment, changes in supply conditions, it would not have been startling if a relaxation of that demand brought only a minor reduction in output.

In 1877–8 a variety of factors caused a cessation of home as well as foreign investment. Output and employment

[1] The change in unit output is illustrated by the fact that in 1873 pig-iron production was 74·1 with 169·5 blast furnaces in blast, 67·4 in 1879 with 123·1.

descended into severe depression. The building boom had ended. The capital market was wracked by falling dividends, doubts about the banking system, uncertainty over the state of international politics, and high money rates. Expectations could not have been worse. There was no incentive even to maintain stocks. Business was executed on immediate order, materials purchased for hand-to-mouth production. And yet so considerable were the secular forces making for increased output that capital-goods production fell less than 8 per cent. from the peak of 1877 to 1879.

Mr. Colin Clark maintains that periods of increased productivity tend to be associated with heavy average unemployment.[1] There is some evidence in this recession of technological unemployment, and of considerable short-time. But on the whole the years 1873–7 were remarkable for the high level at which employment was maintained. Only in 1877 was unemployment over 4 per cent. The descent after 1877 is explicable on quite other grounds than the frictions which accompany increased productivity. In the first six years of the Great Depression it is more probable that the net effect of investment increasing productivity was towards greater than 'normal' employment.[2]

It has been assumed throughout that supply and demand conditions depended not only on judgement of current conditions, but on expectations as well. In the years after the crisis especially, expectations of a further fall in prices tended to make purchasers keep stocks low, and drive hard bargains. This willingness to postpone purchase produced increased competition among sellers, increasingly elastic demand curves facing the individual firm at a moment of time. Entrepreneurs, sensing that the price future would be even more black than the present, were willing to accept a falling return on fixed capital, attempting to improve their net position by

[1] *National Income and Outlay*, 1937, pp. 269–73. Clark seems to hold that the cyclical peak in the seventies was 1876, that from 1870–6 unemployment was low and (because?) productivity stagnant, that from 1877–85 average unemployment was higher and (because?) productivity rose rapidly.

[2] Layton and Crowther conclude that, 'looking at the whole period (1873–96) there seems to be no evidence that employment was less regular than in preceding periods' (op. cit., p. 95). See also Chapter II, above, pp. 47–50.

expanding output and introducing cost-reducing machinery. The growth of competition among sellers is almost as common a complaint as over-production.

Price movements in the expansion of 1880–3 came in two phases: a rise from late 1879 through the first quarter of 1880; an irregular decline in most markets to 1883. Prices were 110 in 1879, 117 in 1880, and 109 in 1883. Production in those years was, respectively, 60, 71, and 78. The large American rail orders in the last quarter of 1879 stimulated a rapid speculative rise in output. Stocks were replenished in expectation of a recurrence of 1871–3 boom conditions. But the increase in American purchases was not maintained, the expected inelasticities did not appear, and prices stagnated or fell.

Recovery in its first phase was based on rail-iron orders. In its second phase it derived from a British ship-building boom, from joint-stock development in Britain, and, to a lesser extent, from widespread export increases. Previous and current investment so extended fixed plant that increased output was accompanied by stagnant or falling prices. So great were the facilities for iron production that even the enormous boom in ship-building caused increased output, but no important rise in price. The first reversal of the upward output trend came in 1882, with a fall in exports, after the continental crises; the second, in 1883, when the fall in freight rates, and a realization of the extent to which ship-building had been overdone, cut short new orders there. Over-optimism on the Clyde was soon corrected and the capital-goods industries were immediately sensitive.

The failure of prices to rise in the latter three years of expansion, the continued narrowing of profit margins, the chronic Stock Exchange slump never yielded a general over-optimism. In ship-building alone can one trace that reconsideration of expectations associated with the normal crisis. Many reports show no realization that output and employment were pursuing a cyclical pattern.

When the speculations of 1879–80 came to an early halt, the business and financial communities settled into passive gloom. The joint-stock boom of these years, involving still

further plant expansion, was not calculated to raise fears of shortage. The investor was, moreover, meeting constant disappointment when he tried to escape the régime of falling interest rates in more speculative ventures. Nor was this disappointment long postponed. Booms in Indian and Cornish mines and the electric light industry flickered and were quickly extinguished within the expansion years.

After three years of such recovery in the previous boom large capital exports and export demands for capital goods had intervened. The impetus which had produced full employment and rising prices in 1871–3 was no longer available. The character of investment had changed, and British industry could not again revel in the illusion of indefinitely rising prices and profits: in particular markets demand curves neither shifted far enough to the right nor became sufficiently inelastic to achieve that happy condition. Excess capacity and severe competition (but not abnormal unemployment) still dominated the industrial position.

Investment at home had supported a substantial part of general recovery in 1880–3. Such investment, ship-building aside, suffered little from false expectations. New issues had been abnormally low in 1883, and the capital market actually revived somewhat in 1884, declining in 1885, reviving sharply in 1886. There was no steep descent to pessimism. Two primary deflationary forces operated on industry: a decrease in exports and a decline in ship-building. Production and prices fell off generally: the former (from 1883–6) by 8 per cent., the latter by 12.

The nature of the previous boom, if anything, shortened the length of the recession. The first signs of returning confidence came late in 1885. There were, generally, no heavy capital losses to liquidate. Even the shipbuilding industry felt ready to revive after a two-year decline. The revival in capital export which had begun in 1879 was interrupted only in 1885. The figures for 1884 and 1886 were considerably higher than for any years in the previous decade. The enticements of the Argentine and the Rand were soon to appear. Towards the close of 1886 even prices showed some tendency to rise, bringing a breath of optimism to trade reports.