Explaining the Global Economic Crisis

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Introduction[1]

During the late 1960s, the long post-war economic boom which had characterised the advanced capitalist countries began to fade away. In its wake came an equally long era of stagnation, decline, and political and economic turbulence. Unemployment, inflation, falling profitability, business failures and bankruptcies were the new order of the day, and it became commonplace to see fearful headlines about the possible collapse of the global financial system or even of accumulation itself.

Such events raised the urgent question about the sources of the long boom, and about the reasons for the subsequent period of turbulent decline. Many different answers have been offered, and the literature is quite large. Explanations have focused on worker strength, monopolisation, demand deficiencies, exhaustion of technological possibilities, international co-ordination difficulties, and declines in profitability. Most concentrate on individual countries, but a few tackled the system as a whole on a global level.[2]

Of the explanations offered, a certain set has concentrated on relating the events in question to the long-term movements of the rate of profit. Accumulation is typically seen as linked to profitability, via national and international competition, technical change, class struggle, wages, and productivity. As we shall see, the profit rate in most advanced capitalist countries has fallen sharply over long intervals, and this has given increased currency to a profit-based focus on economic crises.

In his recent work, Robert Brenner has declared his membership in this last group. This is a welcome on several grounds. Brenner is an eminent historian, and his recognition of the necessary relation between economic analysis and historical account is an important step. So, too, is his emphasis on the centrality of profitability to capitalist reproduction, on the global dynamics of the system, and on

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[1] I wish to thank Thor Thorgeisson of the OECD for help with the ISDB database.

[2] Howard and King 1992, ch. 16; Brenner 1998, pp. 10–22; Callinicos 1998.

the interaction between competition, class struggle and state policy. He brings a keen historian's eye to the unfolding of events which shaped post-war accumulation in the advanced capitalist world, and is sharply critical of the free-market ideology of the times.

Brenner's own explanation is that the decline in the advanced capitalist world originates in the period from 1965–73, when excessive competition between US manufacturers and their German and Japanese counterparts triggered a sharp fall in the US manufacturing prices and hence profit rates. According to Brenner, this fall in US manufacturing profit rates led to a long-term fall in the general rate of profit in the US, in that of the manufacturing sectors of other advanced capitalist countries, and indeed in the general rate of profit of the advanced world as a whole. In this way, the original fall in US manufacturing profitability suddenly transformed the global boom into a global crisis. What followed was a slowdown in the growth of investment, productivity, and real wages, and a consequent rise in intensified class conflict (pp. 36–7, 93–6).

Central to Brenner's thesis is the claim that the fortunes of US manufacturing in the period from 1965–73 determined the subsequent economic health of the whole advanced world. But, in those times, US manufacturing accounted for about 25 per cent of US Gross Domestic Product (GDP), and a mere 12 per cent of the advanced world's GDP. Yet, according to Brenner, this one sector was the lever which moved the world. The central theoretical question, of course, is how this could possibly be so? If one recalls that post-war inflation meant that individual sectoral prices were steadily rising, the question sharpens: precisely how could a fall in *relative* US manufacturing prices reduce the rate of profit of the global economy? One answer might be that this fall was a *trigger* which precipitated a phase change in an already tottering global structure of accumulation. But this would then require some prior grounding, such as a secular fall in international profit rates, to explain why global accumulation had become so weakened in the first place. Brenner rejects any such explanations on theoretical grounds, which, as we shall see, depend critically on the neoclassical theory of perfect competition. Instead, he explicitly argues that the travails of US manufacturing during 1965–73 *transformed* the boom into crisis.

All accounts of the long boom and its subsequent decay, including Brenner's, rest upon particular theoretical foundations, even if these are sometimes only implicit. And, since there are a limited number of available theoretical bases, such accounts frequently end up recombining arguments developed earlier,

stretching as far back as Smith, Ricardo and Marx. In this regard, it is somewhat ironic that Brenner, who has severely criticised others for their 'Smithian' errors, himself ends up invoking Adam Smith's claim that excessive competition in individual industries can lead to a secular fall in the general rate profit.[3] But, since Ricardo and Marx showed long ago that, in itself, a fall in a sector's relative price has no essential impact on the general rate of profit, at a theoretical level, Brenner is forced to try to link the fall in US manufacturing prices to a consequent global *rise in real wages* which is sufficiently large to bring down the global rate of profit. In this, he shares the 'consensus of today's economists' that only an unsustainable rise in real wages can account for a secular fall in the general rate of profit, precisely because he shares their theoretical foundation on this issue. But, at the same time, he seeks to distinguish himself from the rest by arguing that the ultimate cause of this rise in real wages was an outbreak of 'unplanned-for, unforeseen' price competition which drove US manufacturing prices down between 1965–73 (p. 29). Excessive wages are the proximate cause, but excessive competition is the ultimate cause, at a theoretical level. Unfortunately, when he comes to the empirical analysis, he concludes that real wages increases are too modest to induce falling profit rates. And, so, he reverts to a purely Smithian explanation of falling profitability, in which a fall in one sector's profitability drags down the general rate of profit without any reference to excessively rising real wages (pp. 134–8). We will see that, in the end, Brenner is unable to bridge such theoretical and empirical contradictions.

Before we proceed to a more detailed discussion of Brenner's arguments, it is first necessary to look to its foundations: the construction of the basic empirical evidence; the prior theoretical debates about the long-term determinants of the rate of profit, from which Brenner draws much of his theory; his own interpretation of the empirical evidence in the light of his theoretical perspective; and my alternate interpretation of the very same material. Limitations of space require that we focus only on the core empirical issue, which concerns manufacturing profitability in the three countries studied by Brenner (US, Germany, Japan).

I. The theory of profit rate measurement

The observed profit rate is the ratio of profits to capital advanced, all expressed in money terms because it is the money rate by which

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[3] Shaikh 1978; Fine, Lapavitsas et al. 1999.

capitalists judge their success. At the level of its direct impact, what counts is the most concrete measure of the profit rate, eg. profits after direct taxes. But, if one is interested in explaining the evolution of this concrete measure, one must begin with a more general measure. Brenner himself works with the broad profit measure called *net operating surplus*, which is consistently available across a variety of OECD countries. This magnitude is derived as the excess of conventionally measured value added over indirect business taxes and wages, and comprises corporate profits, the income of unincorporated enterprises,[4] net interest, and net business transfers.

Another important issue concerns the appropriate measure of capital advanced, in which theory plays an equally critical role. Consider a set of machine costing £1,000 which lasts 4 years, and suppose annual depreciation is treated as £250 per year. Then, over the 4 years, the capital tied up in the machines itself will be £1,000, £750, £500, and £250, while the *accumulated* depreciation will be £0, £250, £500, £750, respectively. From a business point of view, which Marx adopts in this regard, the capital value advanced for plant and equipment returns gradually to its money form as the fixed assets depreciate. These accumulated depreciation allowances may be held in the form of cash or financial assets, or even reinvested. But, in either case, they count just as much as part of total capital value as does the depreciated value of the machines, for it is the recovery of the sum of the two which allows for the continuation of the enterprise. Thus, for each year of the life of the machines, the capital value invested in it is £1,000. This measure, which is known as the measure of 'gross capital stock', is in fact independent of the manner in which depreciation allowances are allocated. The capital tied up in just the machines, on the other hand, is known as the 'net capital stock'. Now, suppose that the annual profit flows over the economic lifetime of the ageing machines happens to follow the sequence £100, £75, £50, and £25. If we were to use the gross capital stock measure, the ageing of the machines would give rise to a declining profit rate sequence of 10 per cent, 7.5 per cent, 5 per cent, and 2.5 per cent. Yet, if we were to use the net capital stock, the measured profit rate would be constant at 10 per cent in every year, because, in this illustration, the rule used to

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[4] The income of unincorporated enterprises is the net revenue after expenses of proprietors and partners. Strictly speaking, one should try to distinguish between a profit component and a wage component of this net revenue. Such an adjustment is readily made for the US, but makes no difference to the trends involved. Similar adjustments for Japan and Germany are more problematic so, for reasons of consistency, the whole of this net revenue is used for all three countries.

calculate depreciation happens to yield a net value for the machines which declines in proportion to its mass of profit.[5] Of course, in actual practice, depreciation rules do not follow a strict proportionality of the sort illustrated here. Nonetheless, the central point still holds, because all depreciation rules still yield a net stock which decline with the age of the machine, thereby biasing upward the estimates of any age-related changes in profitability. The issue here is not the existence of a measure of net stock, since that is merely the dual of a measure of depreciation, but of its use in estimating the rate of return on capital.[6] Businesses prefer gross stock precisely because it enables them to assess the changing profitability of an asset over its lifetime, and for the same reason, I will use gross stock throughout.[7] On the other hand, Brenner uses net stocks in his profit rate measures, although he uses gross stocks for other purposes (pp. 5, 7 note 3, and 39).

The final issue, also of considerable theoretical and empirical importance, concerns the impact of demand fluctuations on the observed rate of profit. The profit rate is the ratio of the *flow* of profits to the *stock* of capital and, in short-run variations in the degree to which the capital stock is utilised, can have a marked impact on all flow measures, including the mass of profit. Cyclical and conjunctural fluctuations in demand (henceforth referred to as cyclical) can therefore add a highly volatile element to the slower movements in the rate of profit which arise from changes in technology, the length and intensity of the working day, and real wages (ie. to the movements arising from the trends in the composition of capital and the rate of surplus-value). Distinguishing between secular and cyclical influences is crucial, because they have different determinants and different implications. The propositions derived from classical and Marxian theory are typically concerned

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[5] The conclusions are not altered by growth. Suppose the first year depreciation allowance of £250 was reinvested, once and for all, into a second set of similar machines. Except for the fact that they start in the new year, all the time profiles of this new set would be the same as in the previous set, including the difference between the patterns of gross-stock and net-stock profit rates. It follows that this particular difference will be preserved for the combination of the two sets (although the exact level of the average gross-stock profit rate in any one year would depend on the age-profile of the combined capital stock).

[6] At an empirical level, the measures of net stock rise more slowly than those of gross stock in the US and Germany (official measures of net stock are apparently unavailable for Japan). This means that using net stocks, rather than gross, biases the profit rate upward.

[7] Ideally, one would also like to allow for inventories of raw materials and goods in process, as well as for stocks of variable capital. But no consistent data is available for either across countries.

with the secular factors and, to adequately test such theories, one must differentiate between the 'normal capacity' rate of profit and the observed rate of profit. This is conventionally done by adjusting the observed profit rate for the rate of capacity utilisation. Further details are available in the data appendix.

To summarise: *profit* is defined here (as in Brenner) as net operating surplus, which is essentially the sum of corporate profits, non-corporate business income, net interest paid by businesses, and net business transfers. *Capital advanced* is defined here as the current replacement value of the gross fixed capital stock. And, from this, the *rate of profit* can be written in two equivalent ways: as the ratio of profits to capital stock; and as the product of the profit share (profit/value added) and the output-capital ratio (value added/capital stock). Lastly, to bring out the secular trends in the rate of profit and the output/capital ratio, we follow the convention of dividing each by the rate of capacity utilisation. As can be seen by comparing the expressions below for the observed and normal capacity rates of profit, the conventional adjustment only partially adjusts the rate of profit, because it adjusts the output-capital but not profit share.[8]

u = output/capacity

r = the observed nominal rate of profit = profit/capital = (profit share)• (output/capital)

rc = normal capacity profit rate = r/u = (profit share)•(capacity/capital)

Rc = normal capacity output-capital ratio = (output/u)/Capital = capacity/capital

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[8] If we write P = profit, K = capital, and Y = net output, Yc = capacity output, and $u = Y/Yc$ = the rate of capacity utilisation, then the observed rate of profit $r = P/K = (P/Y) \cdot (Y/K)$, while the 'normal capacity' output-capital ratio and profit are $Yc/K = (Y/u)/K$ and $rc = r/u = (P/u)/K = (P/Y) \cdot (Yc/K)$, respectively. If we think of profit as $r = P/K$, the adjustment for capacity utilisation amounts to estimating normal capacity profit as P/u. On the other hand, if we think of profit as $r = (P/Y) \cdot (Y/K)$, then the adjustment amounts to adjusting the output-capital ratio for capacity utilisation fluctuations, but leaving the profit share unchanged on the implicit assumption that a flow-flow ratio such as the profit share does not vary (much) with capacity utilisation. But this latter assumption is clearly not true, empirically, so that a more refined adjustment can be constructed by also adjusting the profit share. This will not be attempted here.

II. International manufacturing profitability and relative prices in the post-war period
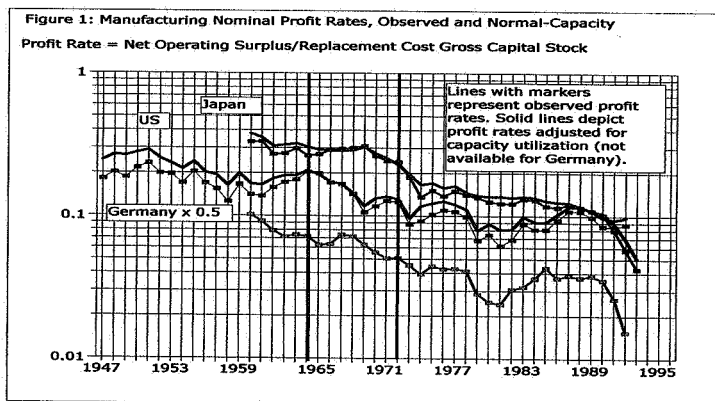
We can now turn to the empirical evidence on manufacturing profitability in the US, Germany, and Japan. The great bulk of the data for all three countries is available from 1960–93 in the latest version of the ISDB electronic database from the OECD, which in turn takes it from each country's national product and wealth accounts. US data was extended back to 1947 using compatible estimates available from the US Bureau of Economic Analysis, and certain missing items for Japan were extracted from various OECD publications and from the *Historical Statistics of Japan*. In all such data, inflation is accounted for by adjusting profits for inventory valuation changes, and by calculating capital stocks in current replacement prices (which also permits an inflation adjustment to depreciation). Finally, capacity utilisation for Japan is the manufacturing operating rate, and for the US is based on my own estimates derived from the studies by Foss and from the same McGraw-Hill survey data upon which the official Federal Reserve Board measure is based. Details are in the data appendix.

For Germany and Japan, Brenner also relies on OECD sources, except that he uses net capital stock rather than gross (pp. 263–4). In the case of the US, the most recent official data does not provide any estimates of gross stocks at all, nor any measures of real output prior to 1977. For this reason, the OECD database uses the most recent net stock estimates, but takes its US gross capital stock data from the previous published accounts. Brenner uses the former, while I use the latter, which I extend back to 1947 using the original source. Real output data for the US has to be filled in prior to 1977, and here Brenner uses unpublished estimates while I make my own estimates based on earlier national accounts series. On the whole, my US and German data seems similar to Brenner's, except for the gross/net stock difference discussed in the previous section. In the case of Japan, the ISDB database has gross but not net capital stock estimates, there apparently being no official estimates of the latter. I use the available gross stock measures, but Brenner makes use of unpublished measures of Japanese net stock which were estimated by the US Bureau of Labor Statistics (p. 266). This difference in capital stock measures appears to matter quite a bit, because the OECD measure of the Japanese profit rate based on gross stocks is strikingly different from that the comparable net stock profit rate shown by Brenner (compare Figure 3, p. 7 in Brenner with Figure 1 below).

In all figures shown, the period from 1965–73 is demarcated because of the critical role it plays in Brenner's own explanation.

Also, all variables are displayed on log scales, because fluctuations of equal magnitude then represent equal *percentage* variations, and the slope of the graph of any given variable represents its rate of growth (or decline). By contrast, on the standard linear scale the same percentage variation in a variable which is at a high value shows up as a larger absolute change than when it is at a lower value. Thus, when variables have downward trends, as do the major variables in this study, linear scales tend to make earlier fluctuations appear larger than later ones.[9] Finally, as noted in various figures, the levels of variables are occasionally scaled downward for expositional clarity. This has no effect on their trends, of course.

Figure 1 presents the movements of the observed rate and adjusted profit rates in the three countries. Note that the level of the profit rate of Germany has been scaled downward for expositional clarity (by 0.5), and that no capacity utilisation adjustment has been made to it due to a lack of consistent data. As is to be expected, all three observed profit rates exhibit substantial cyclical fluctuations, which are only partially removed by the (conventional) capacity utilisation adjustment, since this adjusts the output-capital ratio but not the profit share.[10]

Figure 1: Manufacturing Nominal Profit Rates, Observed and Normal-Capacity

Profit Rate = Net Operating Surplus/Replacement Cost Gross Capital Stock

The distinction between secular trends, cyclical fluctuations and conjunctural events is a critical one. The German and Japanese profit rates exhibit clear secular trends which are modulated by cyclical

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[9] A variable which is 100 when it changes by 10 per cent will change by 10, whereas the same percentage variation when the variable is 20 will only produce a change of 2 – one-fifth as large, on a linear scale. On the log scale, the two variations will look the same.

[10] See footnote 5.

fluctuations, even without adjustment for capacity utilisation. But what of the US data? Here we see the sharp fall in the observed profit rate from 1965–70, upon which Brenner places so great a reliance. Yet it is also clear that a fairly sharp rise from 1958–65 precedes this same episode. Brenner sees the two parts of the overall movement as separate conjunctural events. He attributes the 1958–65 boom to 'significantly lowered' wage growth, 'both absolutely ... and relative to the US's major international rivals', combined with 'striking gains in productiveness' (pp. 57–8). On the other hand, he attributes the subsequent 1965–70 decline to the inability of US manufacturing to 'sustain the favourable trend in relative international costs' (p. 52). But, before making such conjunctural attributions, one must ask: how much of this overall boom-and-bust pattern is cyclical, as opposed to conjunctural? This is not merely an empirical question, because the very decomposition of any observed movement in trend, cycle, and conjunctural elements depends on the underlying theory. If one believes that the profit rate can have an endogenous trend around which there exist endogenously generated cycles, then it is generally not possible to attribute each pair of ups-and-downs to conjunctural events alone. To do so would give rise to what I would call a half-cycle bias. It is evident from other periods in the US data that several fluctuations are of the same percentage order of magnitude as the two under consideration. The same applies to Japan and Germany. The matter is even clearer when one considers the capacity adjusted rates of profit, because then the secular trend is even more evident. In the case of the US, this long-term trend continues until its forcible reversal after 1982, in the Reagan-led attack on labour.[11] In Japan, and implicitly in Germany, this continues into 1993, which is the current limit of the coverage of the OECD ISDB data set.

From a Marxian perspective, the manifestation of a secular trend in-and-through cyclical and conjunctural fluctuations is a perfectly normal expression of what I call the turbulent regulation of the system. *In this light, the 1965–70 fall in US manufacturing profitability is a combination of an ongoing secular trend, a normal reversal of the prior 1958–65 cyclical upturn, and of factors specific to this particular period.* We will see shortly that the evidence on relative prices does not support the notion that an outbreak of excessive competition had a big, let alone lasting, impact in this period.

The next step is to address the proximate determinants of profit rates, by decomposing them into profit shares and output-capital ratios. Figures 2 depicts the former, and Figure 3 the latter with and

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[11] Shaikh and Tonak 1994, pp. 129, 214; Brenner 1998, pp. 37–8, 143.

without adjustment for capacity utilisation, with the levels of some variables rescaled for visual clarity. Once again, all data is on log scales to facilitate the visual identification of equal percentage fluctuations and of long term trends.

Figure 2: Manufacturing Profit Shares
Profit Share = Net Operating Surplus/Net Value Added

Figure 3: Mfg Nominal Output-Capital Ratios, Observed and Normal-Capacity
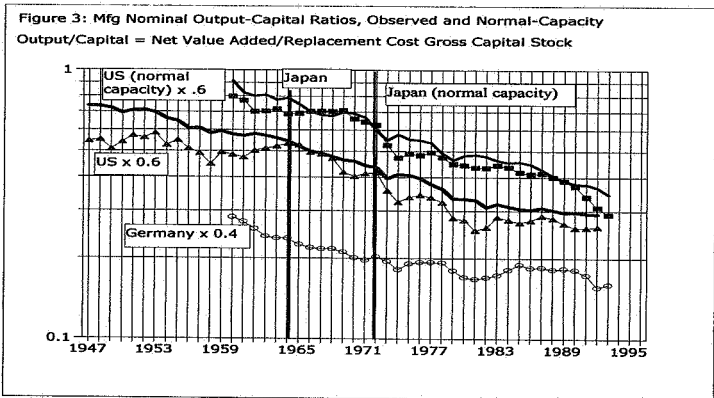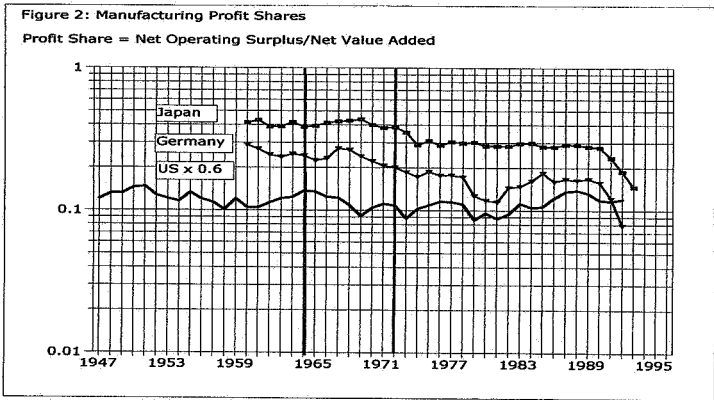Output/Capital = Net Value Added/Replacement Cost Gross Capital Stock

Figure 2 shows that each country's profit shares also decline, in-and-through cyclical fluctuations. But, by comparing Figures 1 and 2, we can see that the profit shares have much lower rates of decline (ie. much lower slopes). On the cyclical side, one can see that the fluctuations in profit shares are responsible for a major part of the corresponding variations in the profit rate. Moreover, we see once again that, in the US case, a sharp rise from 1961–5 precedes the drop in 1965–70, and that neither represents a particularly unusual order of magnitude.

Figure 3 looks at the output-capital ratios, with US and German levels rescaled to facilitate visual inspection. The German and Japanese observed ratios display a clear persistent downward trend throughout, but this is less clear for the US ratio. However, when one adjusts for capacity utilisation to bring out the trend determined by technology and the rate of exploitation, then the pattern is very clear. The US ratio is secularly falling, and that of Japan is falling even more rapidly (Germany being unavailable). *This is equivalent to saying that the ratio of fixed capital to output capacity, which is the money form of the ratio of dead to living labour, is rising steadily throughout the periods for data is available.* Such a movement is one of the central predictions of Marx's argument (see Section IV).

Lastly, Table 1 summarises the preceding patterns, by looking at secular trends (averages of annual rates of change) of both normal capacity and observed variables over particular periods. In the US case, we look at the overall trend from 1947–82 (ie. before the reversal), and also at three sub-periods 1947–61, 1961–74, and 1974–82. In picking these sub-periods, I was guided by two considerations. The first was that they encompass complete cycles so as to avoid the half-cycle bias discussed previously, and the second that one of them brackets Brenner's 1965–73 period. From this point of view, the minimum bracket for Brenner's period is from 1961–74, although Brenner himself uses 1958–75. Both sets are examined. For Germany and Japan, on the other hand, the period from 1960–91 is used, to avoid biasing the secular trend downward by the effects of the deep recessions which began in the two countries after 1991 (pp. 221, 232–3).

Table 1. Average annual rates of growth, secular trends* (Percentages)

	U.S. 1947-82	U.S.** 1947-61	U.S.** 1961-74	U.S. 1974-82	Germany 1960-91	Japan 1960-91
Profit Rate	**-2.40** (**-1.90**)	-2.18 (-0.87)	-3.35 (-2.31)	-1.23 (-3.05)	**-2.62**	**-3.91** (**-3.28**)
Profit Share	**-0.34**	-0.51	-0.78	+0.68	**-1.46**	**-1.12**
Output-Capital	**-2.23** (**-1.98**)	-1.77 (-0.80)	-2.74 (-1.99)	-2.20 (-4.01)	**-1.38**	**-2.73** (**-2.36**)

Finally, one should recall that, in the case of the US and Japan, the adjusted rate of profit reflects an adjustment to the output-capital ratio alone, none being available for profit shares, while, in the case of Germany, all adjusted measures are the same as the observed ones due to lack of adequate data on capacity utilisation.

In Table 1, the adjusted measures are displayed first, with the observed ones in parentheses underneath. The results are quite striking. *The adjusted profit rate falls in every country, in every period and sub-period shown, at annual rates of change ranging from roughly −2.5 per cent to −4 per cent per annum.* The same applies to the adjusted output-capital ratio, which falls steadily at annual rates roughly between −1.4 per cent and −2.8 per cent. The profit share, on the other hand, falls much more modestly, at rates of change ranging from about −0.4 per cent to -1.5 per cent per annum, and even rises in the US sub-period of 1975-82 because of falling real wages of production workers and sharply reduced average real compensation growth (p. 143). *As Table 1 makes clear, the great bulk of the fall in the adjusted profit rates comes from the fall in the adjusted output-capital ratio* (ie. from the rise in the capital-output ratio, which in Marxian terms corresponds roughly to the ratio of dead to living labour): 93 per cent for the US overall, 82 per cent even in the 1961–74 period bracketing Brenner's, 70 per cent for Japan, and 53 per cent for Germany (which is for unadjusted variables).

Unlike the adjusted variables, observed variables incorporate both secular and cyclical influences. Still, even here both the rate of profit and the output capital ratio fall in every country and in every period, although the rates of fall are sometimes lower (eg. US profit rates in 1947–61, Japan from 1961–91) and sometimes higher (US in 1961–74 and in 1974–82), depending on how capacity utilisation is changing in those particular periods.

In the US, the sub-period from 1961–1974 is of special interest because it brackets Brenner's critical period. Here, while the falls in adjusted profit rates and output-capital ratios are somewhat greater than in the preceding sub-period, the falls in the observed (ie. unadjusted) measures are *substantially* greater than in the preceding period. Since the *only* difference between the two sets of measures is the degree of capacity utilisation, we see that it is a fall in capacity utilisation, *not a fall in relative price,* which plays the greatest role in producing the profit rate decline upon which Brenner attempts to build his argument. Indeed, a similar point was evident earlier in Figures 1 and 2, in which it is obvious that a great deal of the decline from 1965–70 is simply the other half of the previous cyclical rise from 1961–65. Some part of this fall in capacity utilisation may be due to conjunctural factors, including a possible intensification of foreign competition. But this would not help Brenner, because it would not explain the prior or subsequent secular falls in the adjusted profit rate and output-capital ratio.

What then of the fall in US relative manufacturing prices? Figure 4 looks at that the price of US manufacturing output relative to

aggregate output (GDP). One can see that, after a steady rise from 1948–60, this price ratio reverses itself and begins to fall secularly from 1960 onward, both before and after Brenner's critical 1965–73 period. Indeed, in the vicinity of this supposedly critical period it deviates below its trend for just two years (1972–3), only to reverse itself in the next two years. All of this provides a very limited basis for any over-competition thesis and is, instead, quite consistent with the considerable body of evidence that relative price trends are driven largely by factors such as relative costs.[12]

Nor is it possible to find that relative price movements generally have a dominant influence on profit shares. Comparing Figures 2 and 4, we see that from 1948–60 the profit share slides downward even though relative prices are rising, while from 1974–86 the profit share trend is stable even though relative prices are falling steadily. Even within the critical period from 1965–73, the movements of the two variables bear no obvious relation to each other.

Figure 4: Ratio of Price of U.S. Manufacturing Output to Price of Aggregate GDP
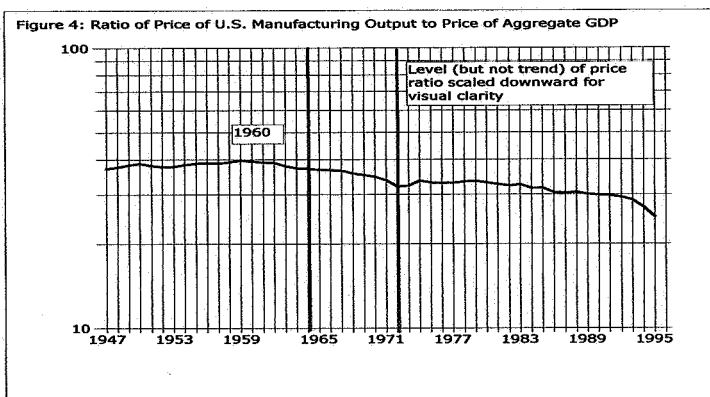
On the whole, the empirical patterns do not provide much support for Brenner's arguments. There is little evidence for any major impact on relative prices from 'over-competition', and their movements do not in any case correlate with those in profitability. Equally importantly, persistent 'over-capacity' cannot explain the secular fall in profit rates, because they exhibit persistent downward tendencies even when (partially) adjusted for variations in capacity utilisation. On the contrary, the empirical results strongly indicate that secularly falling profitability is an intrinsic feature of post-war accumulation in all of the three dominant capitalist countries, and that the great bulk of this fall is driven by rising capital-capacity

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[12] Shaikh 1998; Ochoa 1984; Chilcote 1997.

ratios. Brenner says this himself: 'the fall in G-7 aggregate profitability in manufacturing was determined [almost] entirely by the fall in the nominal output-capital ratio' (p. 136). So it would seem that the empirical evidence provides strong support for Marx's theory of the falling rate of profit driven by a particular form of technical change embodied in a rising ratio of dead-to-living labour (capital-output ratio, in money terms).[13]

Yet Brenner adamantly opposes any such interpretation of the data. He rejects it on theoretical grounds, on the argument that technical change can only raise the profit rate. He rejects it on associated empirical grounds, implying that only real, not nominal, output-capital ratios can be viewed as indices of technical change. And, to round things off, he labels the Marxian argument as 'Fundamentalist' (applied specifically to myself) and 'Malthusian' (applied to Marx also), claiming that it is based on an argument whose logic 'flies in the face of common sense' (p. 11). The unsigned editorial paean which prefaces his text tosses in its own contemptuous dismissal of such thinking as 'aprioristic' (p. ii). It does not note, of course, that Brenner's own argument relies heavily on the neoclassical notion of 'perfect competition'. Apparently this particular 'aprioristic' notion, which so clearly 'flies in the face of common sense', is not a problem. We turn to these themes next.

III. Relative prices, technical change, and the general rate of profit

Although there is little support for Brenner's claim that over-competition plays a major role in driving down manufacturing relative prices, they do nonetheless decline steadily from 1960 onward. The question is, what impact does this have on the rate of profit? The answer, it turns out, depends crucially on the underlying theory of competition.

Suppose we consider a rise in real wages, all other things, including technology and working conditions, being held constant.

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[13] Shaikh, 1987. In Marxian terms, it is the fall in the ratio of living labour to constant capital which drives the rate of profit, and the direct money counterpart of this is the ratio of nominal output to nominal (replacement price) capital stock. Therefore, a falling output-capital ratio is a direct implication of the theory. There is generally also a further argument that these ratios are in turn driven by a rising organic composition of capital, ie. by technical change. This second question, which plays a big role in Brenner's analysis, is addressed in Section V.

Then it has been known from the time of Ricardo and Marx that the general rate of profit would fall. In Marxian terms, such a rise in the real wage would lower the rate of surplus-value while leaving the organic composition unchanged, so that the general rate of profit would fall.

Now, consider a situation where a sector's relative price declines independently of a change in its costs, due to over-competition, for example. Then the *immediate* impact would be to lower the sector's own profit rate, other things being equal. But, if both technology and real wages were unchanged, this would diffuse through the system and there would be no particular long-term effect on the general rate of profit. From a systemic point of view, a fall in a sector's relative price not only initially diminishes its own profitability, but also reduces the costs of its buyers, *including itself.* The second effect counteracts the first, with a lag dependent on the time it takes cost effects to work through into profits.[14] It is well known that, as long as the physical quantities of the inputs and of wage goods are not themselves altered in the process, the net effect on the rate of profit is ambiguous. The indeterminacy applies not only for the system as a whole, but even for any particular sector itself.[15] From a Marxian perspective, this is a familiar result, because a fall in relative price transfers value from the seller to the buyer, so that the loss of the former is the gain of the latter.[16] This effectively overthrows Adam Smith's claim that excessive competition can permanently lower the general rate of profit. In his theoretical section, Brenner therefore acknowledges that, in itself, a change in relative price cannot result in a permanent change in the general (or even sectoral) rate of profit (pp. 28–9).[17]

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[14] It is because of this lag between input costs and output prices that a general collapse in prices can reduce nominal profit rates (even below zero), while a general rise in prices can inflate them.

[15] Sraffa 1963, Chapter 3.

[16] Shaikh 1984; Shaikh 1992.

[17] Brenner 1998, pp. 28–9. It is precisely because value is *conserved* in exchange that profit can differ from surplus-value when prices deviate from values. A price below value, say, transfers value out of the industry to the buyers, so that its profits are thereby below value. But the buyers may use the commodities outside the circuit of capital (eg. personal consumption of capitalists), or the commodities may enter capital stocks whose changed prices are not fully reflected in the current circuit of capital. In this way, a loss to a particular capital as seller may not show up as a gain to some other capital as buyer of constant or variable capital used up, even though the sum of gains and losses across all buyers and sellers is exactly zero. Aggregate profit would, in this case, be below surplus-value. It is the combination of the preservation of value in exchange and the fact that the circuit of capital

However, he goes on to say that if 'labour is able to get *any* of the gains from the decrease in prices ... [this will] result in a fall in profitability for the economy as a whole' (p. 29). It is important to note that particular remark is simply the previously discussed proposition that a rise in real wages under given production conditions will lower the general rate of profit. What Brenner is saying here is that, although a relative price fall cannot directly lower the general rate of profit, it might do so indirectly if it were to raise the growth rate of real wages beyond some critical rate. While this is entirely possible as an immediate consequence of a price fall, since such wage increases are cost increases to employers, workers must be strong enough to hold on to them in the face of employer counterpressure. Although Brenner does not say so, his argument relies considerably on worker strength.

Once technical change is introduced into the analysis, things are different. Technical change raises the productivity of labour, so that a real wage increase is no longer sufficient to lower the rate of profit. What needs to be specified is the manner in which technical change also affects the output-capital ratio. And this depends crucially on the underlying notion of competition: real competition as it appears in Marx's analysis, versus the neoclassical vision of perfect competition upon which so many writers, including Brenner, base themselves.

Marx argued that the restless desire to increase profits was intrinsic to capital-as-self-expanding-value. This inner compulsion drives individual capitals to do battle on two fronts: against labour in the labour process, over the incessant attempt to raise productivity and hence lower costs; and against other capitals in the circulation process, in order to defend and expand markets. The continual struggle against labour leads to mechanisation as the dominant means for cost reduction. The continual struggle against other capitals, which is the competition of capitals, is in turn characterised by price reduction. *Active and aggressive cost-cutting and price-cutting are intrinsic expressions of the nature of capital.*[18]

Cost-reducing technical change provides the general basis for price-cutting, because the latter is not sustainable without the former. However, Marx argues that the higher productivity of labour which forms the basis of lower (normal capacity) unit cost is generally achieved at the expense of higher quantities of fixed capital per unit of (normal capacity) output: a higher unit investment cost is

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does *not* encompass the whole of social reproduction that gives rise to this effect (Shaikh 1992).

[18] Shaikh 1978; Shaikh 1980; Shaikh 1989.

the 'cost' which must be generally incurred to achieve the benefit of a lower unit cost of operation.[19] In the language of micro-economics, this implies that technical change tends to generate rising average fixed costs, and falling average variable and total costs. From the point of view of business, these patterns are so familiar that they have come to represent the 'normal' form of technical change in detailed empirical studies and even in some management textbooks.[20] It is interesting to note that recent international comparisons find exactly the same pattern: in general, the higher the productivity of labour in a nation, the lower is its output-capital ratio.[21]

In Marxian value terms, this implies that technical change tends to raise the rate of surplus-value s/v by raising the productivity of labour, while simultaneously lowering the ratio of living labour to dead labour $(v+s)/C$. Both these arguments are explicit in Marx.[22] In money terms, at sectoral or economy-wide levels, this implies that technical change tends to generate falling unit costs, particularly falling unit labour costs, by means of a generally falling nominal (adjusted) output-capital ratio, ie. by a generally rising capital-capacity ratio. It should be noted that the link between technical change and a falling nominal output-capital ratio is direct, via the micro-economic trade-off between lower unit operating costs and higher unit investment costs. *The argument does not require that the 'real' output-capital ratio, or indeed any similar measure, also rise.* On the contrary, technical change lowers an industry's nominal output-capital ratio directly, while at the same time lowering its relative price. If this pattern holds at an aggregate level, the real output-capital ratio will fall less than the nominal. This point will take on some significance when we come to Brenner's interpretation of the observed falls in profitability, in the next section.

If one recalls that the normal capacity rate of profit can be written as

$$rc = (\text{Profit Share}) \cdot (\text{Capacity/Capital})$$

and, if one momentarily ignores the distinction between the profit share and the rate of surplus-value (to which we will return), the preceding arguments can be translated into the propositions that price-reducing technical change, *taken by itself,* will tend to raise the

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[19] The term 'operation' is preferable to production because, from classical and Marxian perspectives, only some capitals are involved in production, while others are involved in circulation or finance.

[20] Pratten 1971, pp. 306–7; Weston and Bringham 1982, pp. 145–7.

[21] Foley and Michl 1989, pp. 15–16.

[22] Rosdolsky 1977, chs. 16–17.

profit share by lowering unit labour costs and also simultaneously lower the capacity-capital ratio. Although it may then seem that the effects of technical change on the general rate of profit are indeterminate, they are not: *even with a rising profit share, a falling output-capital ratio will generate a secular tendency for the rate of profit to fall.* This is because the profit share is bounded between 0 and 1 (and, in practice, between far narrower limits), so that if the output-capital ratio were to fall persistently, it would drag the rate of profit downward. Marx himself demonstrated this,[23] and this can easily formalised.[24] All of this holds even if real wages were constant. Insofar as real wages rise, they lower the profit share relative to this trend, thus exacerbating the intrinsic tendency for the rate of profit to fall. But they do not cause it.

All of this, of course, occurs at the level of individual capitals. And, here, the question arises: under what conditions would they invest in new method of operation? And the answer, common to all sides in the ensuing debate, is that they would do so if the *expected rate of profit on the new method appears likely to be higher than that on the existing methods.*

It is here that my notion of 'real competition', which derives from Marx, diverges sharply from the neoclassical notion of 'perfect competition'. The notion of real competition is directly built upon the idea of aggressive price-cutting by firms as they strive to 'make room for themselves'. On the other hand, neoclassical economics assumes that all firms are 'price-takers', in the sense that they behave *as if* they can sell as much as they want at the existing market price, which they are assumed to treat as 'given' to them. As is well known, this amounts to assuming that individual firms never need have any concerns about the demand (room) for their particular product.[25]

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[23] Rosdolsky 1977, ch. 26.

[24] Shaikh 1992, pp. 177–8.

[25] Negeshi 1987; Roberts 1987. The neoclassical 'price-taker' story is rationalised on the grounds that if each firm is small enough relative to the total, its individual effect on the market price will be small enough to ignore. It is said that each firm would then be justified in assuming that it can sell as much as it (individually) desires at any given price. But, for any small firm to have no effect on the market when it acts, it must act alone. Thus the real secret of the story of perfect competition is that each firm is implicitly taken to believe that when *it* acts to change production, no *other* firms will do so. Unfortunately, such a belief contradicts two other key assumption of the neoclassical story, which is that firms are all alike, and that they have 'perfect knowledge' of the consequences of their actions. If that were so, each individual firm would *know* that when it acts, so will all of its brethren, so that the *collective* effect on the market would necessarily be non-negligible

The two contrasting notions of competition, which are rooted in differing conceptions of capital itself, have sharply different implications for the issue of the effects of technical change on the general rate of profit. They share the assumption that firms will choose a new method of operation if it appears to promise a higher *expected* rate of profit. But since any such estimation is profoundly dependent on their expectations about the future selling price of their product, it is here that a great difference arises.

Within perfect competition, the expected future price is the current price because firms are assumed to be passive 'price-takers'. This means that firms are assumed only to invest in a new method when it appears to yield a higher rate of profit at the current price. Under this assumption, the new method would always add a new higher rate of profit to the existing pool. Technical change therefore lowers the sector's relative price, but always *raises* the general rate of profit. It may raise the unit investment cost, ie. lower the output-capital ratio, but this would be more than offset by productivity increases. As in the case of Marxian real competition, what is relevant here for the investment decision is the *nominal* unit investment cost, ie. the reciprocal of the nominal output-capital ratio. This is the so-called Okishio theorem.[26] An immediate implication of this result is that the only way in which the rate of profit can fall is if real wages rise sufficiently to negate the overall effects of technical change. If the output-capital ratio is roughly stable, then real wages must rise more than productivity in order to reduce the profit rate. But if the output-capital ratio were lowered by technical change, then it would take a somewhat lower growth rate of real wages to induce a falling rate of profit. The important thing is that, within this perspective, there is always room for real wages to grow and also for the rate of profit to rise, so that only an *excessive* rise in wages can account for a falling rate of profit.

My conception of competition yields just the opposite conclusion. Once a new lower-cost method becomes available, a round of falling prices is initiated as the first capitals to adopt the new method take advantage of their lower costs to make room for themselves. Falling prices will reduce all profit rates, including their

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and their room in the market (their share of industry demand) would have to be taken into account. It follows that the theory of perfect competition is internally inconsistent because it presumes that firms hold irrational expectations. Conversely, if firms are assumed to be coherent in their expectations, then the theory of perfect competition collapses. This theme is developed further in a forthcoming paper on the critique of the micro- and macro-economic foundations of neoclassical economics.

[26] Okishio 1961.

own. But, because their costs are lower, they can always drive prices down to the point that their own rate of profit will be higher than that of the older firms. If lower costs are generally achieved by means of higher investment costs, then even methods which have lower profit rates at *current* prices will be used, because their lower costs promise higher expected returns in the face of lower *expected future* prices.[27] These will therefore add a lower rate of profit to the pool, so that over time the *process of technical change would produce a slow but steady downward drift in the general rate of profit.* Any increases in real wages would then merely exacerbate, not cause, this decline.[28]

Brenner's own argument is an inconsistent admixture of these two opposing perspectives. On the one hand, he begins from the standard logic of perfect competition, saying that in a world 'of perfect foresight and perfect adjustment' (p. 25), 'cost-cutting technical change poses no problem' (p. 24). New methods of production will displace some users of older methods *'at the established price'* (p. 25, emphasis added.), which will add a new 'higher rate of profit in the line', so that 'the average rate of profit in the line rises'. As the new method establishes itself, the price in the line will fall due to the reduced costs, and 'so long as workers do not secure all the gains from the reduced price in the form of increased real wages', there 'will be an increase in the rate of profit for the economy as a whole'. All of this, it will be recalled, relies on the notion that firms are passive 'price-takers'.

But then he takes up the opposite conception, on the grounds that 'in the real world of economic competition', firms do actually engage in price-cutting behaviour. Beginning from the same initial conditions, in which firms with more advanced methods *always* have higher potential profit rates at the established price, they 'reduce the price of their output and expand their ... market share', until their own initially higher profit rate falls to the level of the previously 'established rate of profit'. On the other hand, since older capitals begin from the established rate, their profit rates are reduced below it during the same process. The net result is that the *average* rate of profit rate in the sector falls below the previously established rate. It should be noted that the profit rates of new capitals have fallen to the *previous* 'established' rate, while those of older capitals have fallen below it, so that new capitals still have profit rates above the average (p. 25). If the industry average rate and its 'established' rate were the same thing (Brenner does not actually say), then the process must

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[27] Nakatani 1979; Shaikh 1989.
[28] Shaikh 1987, p. 116.

continue until the price has fallen to the level at which all the older capitals have been driven out. But, if that were so, then higher profit rate of new capitals would end up raising the industry average, which would in turn help to raise the general rate.

Brenner concedes that, if the old methods were indeed squeezed out during some adjustment process, the average profit rate in the line would rise, so that there would eventually be 'an increase in the rate of profit for the economy as a whole ... just as in the case of perfect foresight/perfect adjustment' (p. 26). But, he says, such an outcome can be stalled by the fact that firms continue to keep old methods in use as long as their profits are above the scrapping margin, so that the average profit rate in the line will first fall for some time, other things being equal (p. 27). Note that industry profit rates fall not because new price-cutting capitals introduce more investment-intensive methods, as in my argument, but because older capitals 'fail to adjust' in the face of competitive challenge. In this way, Brenner tries to reconcile his neoclassical starting point, which implies that profit rates rise, with his belief that price-cutting behaviour lowers the rate of profit of an industry experiencing (excessive) competition.

The contrast between my approach and the one Brenner adopts can be illustrated by means of a simple diagram. Consider a given method of operation evaluated at its normal capacity levels. Then, since nominal profit per unit output is simply the difference between unit price and nominal unit costs, we can write the rate of profit as

$$r = \frac{profit}{capital} = \frac{(profit/output)}{(capital/output)}$$

$$= \frac{unit\ price - unit\ operating\ costs}{unit\ investment\ costs}$$

The unit operating and investment costs are given to individual capitalists, but selling prices are variable since capitals engage in price-cutting behaviour. Thus unit prices (p) and the rate of profit (r) on a given method of operation will be positively related in a linear manner. If we rewrite the expression for the rate of profit in the manner shown below, we see that it is a straight line in which the first term is the intercept and the second the slope.

$$r = - \frac{unit\ operating\ costs}{unit\ investment\ costs}$$

$$+ (1/unit\ investment\ costs) \cdot unit\ price$$

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In Figure 5, the existing (older) method is depicted, with an initial price p_0 and corresponding profit rate r_0. Also shown are two potential new methods marked 'newA' and 'newB', respectively. Now, according to Brenner's argument, any new method *must* have a higher rate of profit at the existing initial price p_0, so only method newA qualifies. Then, according to him, the capitals employing this new method would lower their price to the level p_1, at which point their profit rate would have fallen to the pre-existing rate r_0, while that of the older method would have fallen to some lower level. Note that, whereas both profit rates have fallen in the face of price-cutting, the new method retains its profitability advantage over the old.

Unfortunately, Brenner's initial assumption that any newer method must have a higher rate of profit at *existing* prices (which comes from the theory of perfect competition) contradicts his own subsequent assumption that firms engage in price-cutting behaviour (which comes from Marx's theory of competition). If firms do indeed cut prices to make room for themselves, knowing that this will lower all profit rates, then all that matters is that they *end up* with a profit-rate advantage at some new price. And, for this, it is not necessary that they start out with one. Thus method newB depicts the kind of new lower-cost method which has a higher unit investment costs, in which its initial rate of profit need not be higher, but its *expected* rate of profit is indeed higher at any price below a certain critical price (where the old method and newB cross) and remains so thereafter. Thus, as the new method lowers its price, it gains the relative advantage in profitability. Indeed, it always has the capacity to drive price temporarily down toward p^*, at which point the older method is 'done for' because its profit rate approaches zero. This price p^* is therefore the extinction-price which looms on the horizon of the older method once a newer method such as newB becomes possible.

In either of the two scenarios, price-cutting leads to falling profitability in the interim. But, in the Brenner scenario, as a method such as newA comes to dominate, the general rate of profit is *raised*. This is precisely why he must turn to an excessive real wage increase, however it is induced, to explain falling profitability. On the other hand, in my scenario, as methods of type newB come to dominate, the general rate of profit can fall, and will do so over successive rounds of investment-intensive technical change, even if real wages are unchanged.

Figure 5: Profit Rates and Types of Competition
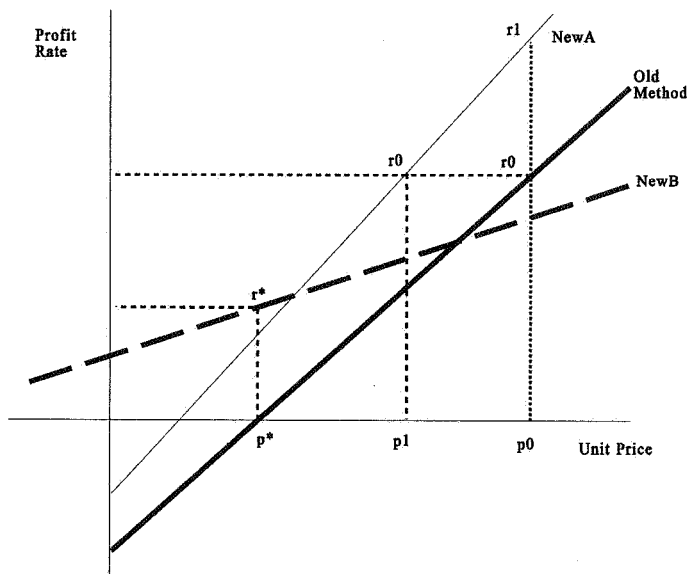
In the end, Brenner has two central results to contend with. From the relation between individual sectors and the whole, he knows that a fall in a sector's relative price which occurs independently of cost changes (eg. due to excessive competition) cannot cause a secular fall in the general rate of profit. On the other hand, when relative prices are driven by technical change, *if firms are assumed to be passive 'price-takers'*, then the general rate of profit is actually raised. It follows that when there is ongoing technical change, only sufficiently large increases in real wages can produce a secular fall in the general rate of profit (pp. 28–9).[29] On this fundamental issue, Brenner is part of the 'consensus of today's economists' (pp. 8, 13), precisely because he shares their theoretical foundations. Where he attempts to

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[29] On the basis of perfect competition, if technical change were to leave the output-capital ratio unchanged, then it must raise productivity in order to increase the overall rate of profit. Under these conditions, real wages would have to rise more rapidly than productivity in order for the rate of profit to fall. If output-capital ratios were rising, then real wages would have to be rising even faster to produce the same effect. But if output-capital ratios were falling, real wages could rise less rapidly than productivity and still produce a falling rate of profit. In all cases, it is an excessive rise in real wages which produces the fall in the profit rate, since technical change is assumed to always raises it.

distinguish himself is through his claim that the squeeze on profits from rising real wages comes about not because workers force real wages up excessively, but rather because excessive competition drives prices down and workers are strong enough to appropriate some of this gain 'through a higher real wage' (p. 29). It is an outbreak of excessively competitive behaviour by capital which causes the crisis, although labour helps by taking advantage of it (p. 25).

There are several critical difficulties with this argument. The first stems from Brenner's reliance on the Okishio theorem and its claim that technical change cannot induce a fall in the general rate of profit. Yet, we have seen that this notion *requires* that firms behave as 'price-takers', for it is that assumption which ensures that they would only introduce methods yielding profit rates above the 'established' rate, thereby always pulling the general rate upward. On the other hand, if firms are assumed to be active price-cutters, as in my argument about real competition, nothing prevents them from introducing methods which lower both the industry and the general rate of profit, so long as their expected rate of profit in the face of expected price cuts justifies them (see Figure 5). In both conceptions of competition, it is the expectation of higher profit rates which drive the process. The difference arises from the analysis of the expected future path of prices. Unfortunately, Brenner takes both sides at once. On the one hand, he uses the Okishio theorem, which is premised on 'price-taking' behaviour, to dismiss my overall results, labelling them as 'Fundamentalist' and 'Malthusian', and misrepresenting their content (pp. 11–12 and footnote 1, p. 11).[30] At the same time, he summarily appropriates my own argument about real competition and the price-cutting behaviour of firms, without realising that this destroys his own prior claims about the inevitable profit-enhancing effects of technical change.[31] Nor does he seem aware that once technical change can itself lower profit rates, his whole thesis on the 'failure to adjust' of older capitals becomes a secondary issue.

The second problem is that, even though his own theory requires an excessive rise in real wages (albeit triggered by an excessive fall in prices)

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[30] Brenner characterises my argument as the claim that 'individual firms are obliged to maximise their profit *margins* (their rate of return on circulating capital)' (footnote 1, pp. 11–12). This seriously misrepresents my argument that capitalist competition will force the adoption of those lower-cost methods which yield the highest expected rate of return (on total capital advanced) in the face of expected price movements. A detailed version of my thesis, with explicit numerical examples, appeared in *Against The Current*, a journal in which Brenner is a leading figure (Shaikh 1989).

[31] The fact that falling prices can permit the introduction of profit-rate lowering technology was subsequently recognised by Nakatani (1979, pp. 66–7).

to account for a fall in the global rate of profit, Brenner never establishes how one would judge whether real wage increases were indeed 'excessive'. At any given real wage, technical change affects the output-capital ratio directly, and the profit share indirectly, through the productivity of labour. Brenner's theory claims that technical change always raises the rate of profit, ie. always raises the product of the profit share and the output-capital ratio, say from 10 per cent to 12 per cent. Any rise in real wages would then reduce the rate of profit from its new higher level (12 per cent), but only an 'excessive' rise in real wages would reduce the rate of profit below its initial level (10 per cent). The precise definition of 'excessive' varies according to how technical change affects the output-capital ratio. If this ratio was unchanged, then the critical condition is when real wages rise as fast as productivity because, under these circumstances, this would just keep the profit rate constant. But since the output-capital ratio is falling, as Brenner himself notes (p. 136), then the critical rate of increase of real wages would be lower than that of productivity growth. In all cases, only real wage growth greater than the critical rate could account for a falling rate of profit within Brenner's theoretical framework. To test his claims, he would have to show two things: first, that technical change at a constant real wage does indeed give rise to a rising rate of profit (the Okishio scenario); and second, *if the first proposition is true,* that the actual rate of increase in real wages was greater than the critical rate. He does neither.

In any case, Brenner seems to believe that it is sufficient to compare the rate of increase of real wages directly with productivity growth. And here he finds that, in the very period from 1965–73 in which he locates the critical fall in manufacturing profit rates, real wages actually grew more *slowly* than they did in the prior 15 years, while productivity growth increased on average (pp. 96–8). He uses this fact to criticise other writers in the 'consensus' school who claim that the global decline in profitability was rooted in an excessive rise in real wages. This is particularly odd, because he himself is a member of the very same school, and has indeed made the very same claim in his theoretical section (pp. 28–9).

So, in his empirical section, Brenner ends up at an impasse: his theory requires an excessive rise in real wages in order to explain the falling rate of profit, but his empirical evidence appears to suggest that the rise in real wages is anything but excessive. Faced with this contradiction, he reverts to the claim that it was excessive competition in manufacturing which *directly* brought down the average rate of profit in the global economy (pp. 100–3, 136–8). This is simply the Smithian theory of a falling rate of profit.

We have already noted that a decline in a sector's relative price independent of a change in its costs, eg. due to over-competition,

will not have any determinate effect on the general rate of profit. Classical and Marxian theories are premised on the notion that aggregate *industrial* profit originates in production, through the creation of a surplus product and surplus-value,[32] so that price changes merely transfer it from one venue to another. But it is important to note that circulation can also give rise to profit in its own right, provided it involves a fundamentally unequal exchange between two poles. This was the secret of merchant capitalism, which lived off 'buying cheap' at one pole and 'selling dear' at another. And in such circumstances, competition can indeed erode the gap between the purchase and selling prices, thereby reducing not only individual profit rates but also the total.[33] The irony here is that, in his particular explanation of falling profitability, Brenner not only abandons Marx for Smith, but also industrial capitalism for merchant capitalism. We turn to this next.

IV. Relative prices and the output-capital ratio

Brenner's whole argument revolves around the simple empirical fact that the falls in adjusted nominal output-capital ratios account for the great bulk of the falls in adjusted profit rates, in all countries and in all periods (Table 1). He acknowledges this himself. This seems to support Marx's argument that it is technical change which drives

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[32] Even though profit originates in surplus-value, the two are generally very different even when prices are proportional to values (ie. independently of the celebrated 'transformation problem' effects). Once one accounts for the difference between production activities and those of distribution and social maintenance, then surplus-value encompasses not only the sum of profits, net interest paid, net transfers, and net rents, but also non-production expenses (depreciation, materials, and wages of non-production staff) and indirect business taxes (Shaikh and Tonak 1994, chs. 2–3). This has a critical implication. If real wages of production workers were rising more slowly than the productivity of labour, the rate of surplus-value would be rising. But even if the real wages of non-production workers were rising at this same (non-threatening) rate, total non-production expenses could be rising relative to surplus-value if businesses were raising the number of non-production jobs relative to production ones. This would squeeze the share of profit-type income (profits, net interest, net transfers) in total surplus-value, not because of an overly active increase of real wages by workers, but because businesses were devoting a rising share of labour and capital to commercial, financial, security-related and other non-production activities. It would then be *possible to get a falling profit share in value added even though real wages are rising more slowly than productivity – which is exactly the pattern one finds in the US* (Shaikh and Tonak 1994, pp. 122–9).
[33] Shaikh 1990.

down the output-capital ratio and thus produces a falling rate of profit. But Brenner cannot accept this, because within his framework technical change could never cause so great a fall in output-capital ratios as to bring down the rate of profit. And, so, he attempts to reconcile his theory with the facts by arguing that it is a fall in relative prices which accounts for the fall in the nominal output-capital ratios. Since he knows that technical change itself lowers relative prices by lowering relative costs, he must look for some further independent factor which might cause an extraordinary fall in relative prices which is unconnected to such cost changes. Hence the need for something like an outbreak of over-competition as the principal factor driving down relative manufacturing prices. *This is the whole secret of Brenner's theory.*

In his empirical section Brenner therefore attempts to establish a causal chain between relative prices and the general rate of profit.

> To sum up my argument on the onset of the long downturn ... between 1965 and 1973, aggregate manufacturing profitability in the G-7 economies declined by about 25.5 per cent. Considering the US, Japanese and German cases, there is little evidential basis for the ... argument that the increased power of and pressure from labour leading to the outrunning of productivity growth by wage growth was responsible for this fall. This conclusion can be extended to cover the G-7 economies taken together ...

> Rather, aside from the increased growth in the cost of raw materials, the fall in G-7 profitability in manufacturing was determined entirely by a fall in the nominal output-capital ratio. Since what lay behind that fall was the *inability of output prices to keep up with the growth of capital stock prices* [emphasis added], it seems reasonable to at least advance the hypothesis that what caused a good part of the decline was ... the inability of manufacturers to mark up sufficiently over costs due to international manufacturing over-capacity and over-production ... (p. 136)

> The declines in the profit share and the output-capital ratio, which determined arithmetically the fall in manufacturing profitability [were] ... almost entirely the result of the slow rate of increase of manufacturing output prices. (p. 103)

> The advanced capitalist world entered into crisis ... experiencing falling profitability, especially in manufacturing ... (p. 138)

There are three analytical propositions contained here. First, falling manufacturing relative prices reduce the profit share in US

manufacturing; second, they also account for the bulk of the fall in the US nominal output-capital ratio; and third, the consequent fall in the US manufacturing profit rate drags down the general rate of profit in the whole advanced capitalist world. There is no reference here to excessive growth of real wages, directly or indirectly occasioned. Rather, what we have here is simply a restatement of the Smithian theory of the falling rate of profit: an extraordinary fall in relative prices in one sector reduces not only its profit rate but also the general rate of profit.
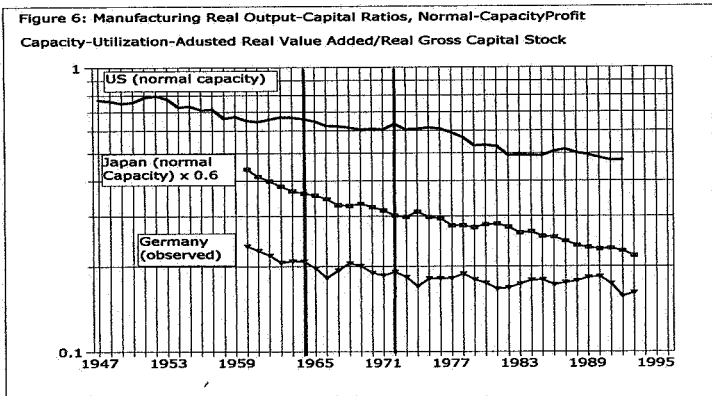
Of the three propositions, the third is the Smithian one, and has already been addressed in the preceding section. So too has the first, in Section III, where we found that US manufacturing relative prices begin to fall secularly well before, and continue to fall well after, Brenner's critical 1965–73 period. This is very consistent with cost-induced relative price changes, and the only deviations from this pattern come when prices fall sharply below this trend in 1972–3 but then recover equally sharply in 1974–5 (Figure 4). We also saw that the US manufacturing profit-share was strongly affected by business cycles, so that looking at just a down-phase (as in 1965–73) gives rise to what I called half-cycle bias (Figure 2). Finally, we noted that changes in relative prices do not generally correlate with those in profit-shares, even within the critical 1965–73 period.

This leaves only the second proposition, which claims that it is a fall in relative manufacturing prices which accounts for the fall in the manufacturing nominal output-capital ratio. To see the logic underlying this, we need to elucidate the connection between relative prices and nominal and real output-capital ratios. If we estimate a price index py for a bundle of goods similar in composition to the net product, then we can deflate nominal capacity output Yc to form an implicit measure of 'real' (ie. constant purchasing power) capacity output: Ycr = Yc/py. The same can be done for the nominal capital stock via a price index pk, representing the price of some (other) bundle of capital goods. With this in mind, we can write the real output-capital ratio as the ratio of the nominal output-capital ratio to the relative price of net output to capital:

$$(\text{real output–capital ratio}) = \frac{Ycr}{Kr} = \frac{(Yc/K)}{(py/pk)}$$

$$= \frac{\text{nominal capacity–capital ratio}}{\text{relative output price}}$$

Figure 6 looks at manufacturing real output-capital ratios, adjusted for capacity utilisation (as required in the analysis of technical change).

We find that like the corresponding nominal ratios, they all fall secularly. But these real ratios fall at a slower rate than the nominal ones, at about half the rate in the case of the US and Germany over the long run, and about three quarters the rate in the case of Japan.

Figure 6: Manufacturing Real Output-Capital Ratios, Normal-CapacityProfit
Capacity-Utilization-Adusted Real Value Added/Real Gross Capital Stock

Recalling that the real output-capital ratio is the nominal one divided by the relative price of output, the reason for the relatively slower decline in the real output-capital ratios is directly evident in Figure 7, which shows that the relative price of manufacturing output to capital stock also declines in all three countries, at varying rates.

Figure 7: Relative Price of Net Mfg Output to Gross Fixed Capital
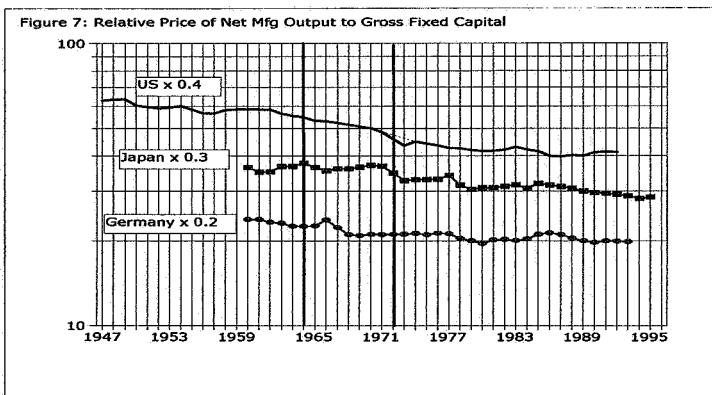
The question is: what does this mean? We know from the discussion of technical change that investment decisions of firms are made directly in terms of nominal unit operating and investment costs. Technical change directly affects the sector's relative price through

the former, and affects the nominal output-capital ratio through the latter. The real output-capital ratio is then merely the end result of these two joint effects, and if the sector's relative price happened to fall over time, its measured real output-capital ratio would necessarily fall less than the nominal one (see the preceding expression linking the two). This point holds for both Marxian and neoclassical theories of competition. Where they differ is on the extent to which the nominal output-capital ratio might fall, since within Marx's argument it can fall enough to drag down the general rate of profit, while for Okishio it cannot.

So, in order to establish that relative prices are largely responsible for the observed fall in nominal output-capital ratios, Brenner must demonstrate that the bulk of the fall in relative manufacturing prices is independent of technical change. This is why such a central part of his narrative is devoted to his over-competition thesis.

But, if we look at Figure 7, it is immediately apparent in all three countries that the relative price falls are secular. In the US, this secular fall accelerates in 1962, before the putative period of excess competition, and continued to decline at the same (percentage) rate until 1971. Then, as with manufacturing prices relative to the price of aggregate GDP (Figure 4), there is a sharper fall for two years, followed immediately by a sharp return to trend in the next year. Whatever is driving this long-term movement, it is certainly not excessive competition in the critical period. Little comfort for Brenner here.

Brenner tries to advance the opposite conclusion by representing the real output-capital ratio as a direct index of technical change. But this is not right, because even the Okishio theorem only implies that the nominal output-capital ratio can never fall sufficiently to actually lower the general rate of profit. Thus, even the standard framework which Brenner adopts is perfectly consistent with a decline in the real output-capital ratio, depending on what happens to relative prices. Brenner misreads this as forbidding declines in the *real* output-capital ratio, which in the tradition of neoclassical theory he calls the 'productivity of capital'.[34] He presents my argument in the

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[34] Marx speaks of a labour process in which workers operate on raw materials and semi-finished goods using means of production tools, to produce new use-values. In a capitalist labour process, all of the elements are forms of capital: constant capital, variable capital, and commodity-capital (output). The productivity of labour refers here to the relation between labour, the active subject, and its product. But in neoclassical economics, the same process is conceptualised as one in which 'factors of production', things called labour and capital, enter into a production function to produce output.

same light, as one proposing 'a decline in profitability ... resulting from declining productivity ... [ie.] a decrease in capital productivity (real output-capital ratio)' (p. 11). This he says, 'flies in the face of common sense' (p. 11, footnote 1).

Well, Figure 6 demonstrates that, in all three countries, real output-capital ratios do indeed fall significantly over the long run. Indeed, a recent study encompassing 126 countries across the globe finds an unmistakable pattern in the data which 'leaves little doubt that there is a powerful tendency for national economies to follow a path of declining capital productivity and rising labour productivity in the course of economic development'.[35] So much for common sense. More importantly, from the sides of both Marx and Okishio, this outcome is perfectly consistent with the fact that the real output-capital ratio is the joint product of the effects of technical change on relative prices and nominal investment costs.

But, now, an intriguing question arises. Why do manufacturing prices relative to those of capital goods display such persistent secular trends? If they are driven by relative technical change, it must be because technical change is more rapid in manufacturing than in the production of capital goods (equipment and structures). Of capital goods in general, equipment is produced within manufacturing, whereas structures are produced within the construction industry. So, if manufacturing technology has consistently improved more rapidly than construction technology, one would expect that manufacturing prices would decline relative to those of capital structures. One way to test this hypothesis is compare manufacturing prices to investment and capital stock price indexes, respectively. Investment comprises a much larger percentage of equipment, and the capital stock a much larger proportion of structures, because structures are more durable than equipment. We then find that the price of manufacturing relative to the price of its investment goods declines a lot less than that relative to the price of its capital goods.[36] On the surface, this is quite consistent with the hypothesis that technical change in construction lags persistently behind that in manufacturing, in all countries.

Each factor is said to be rewarded in the market according to its 'contribution' to the overall net product, ie. according to its marginal product. This identification of wages and profits with the marginal products of labour and capital, respectively, then allows us to view the productivity of labour and the output-capital ratio as the corresponding average products. It is from this vantage point that the output-capital ratio appears as the (average) 'productivity of capital'.

[35] Foley and Marquetti 1989, p. 10.
[36] US Department of Commerce and BEA 1998

Nonetheless, any such interpretation is quite premature, because it is also well known that there are significant problems in the measurement of the prices of durable manufactured goods, and even worse ones for construction. So, one has to consider the possibility that some or even most of the observed relative price movements may be statistical artefacts. This is a complicated topic which cannot be addressed in any depth here, except for the issue of adjustments for quality changes. Every computer buyer is familiar with the phenomenon that for a given amount of money (say $2,000) one can buy a new more advanced computer every year. If we were to take each new computer as equivalent to its predecessors, then the unit price would be constant throughout ($2,000). The 'real' quantity of computers would therefore be constant (ie. always equal to 1). But, if we were to adjust for quality changes, then we might find that each year we were getting more 'computing power' for our money, say twice as much in each successive year. That is equivalent to saying that the implicit price of a unit of this computing power declines every year, say from $2,000 initially to $1,000 in the second year and $500 in the third. Then, dividing the amount of money spent each year on a computer ($2,000) by the declining quality-adjusted prices would yield rising 'real' computer values of 1, 2, and 4 respectively. Unit prices, quality adjustments, and 'real quantities' are therefore intrinsically linked, as every computer buyer knows from practice. Indeed, in the market, this linkage shows up in the fact that the 'street' price of a particular model declines rapidly in the face of newer models, even though the list price is frequently kept unchanged.

A direct implication of the preceding discussion is that inadequate adjustment for quality change will create an upward bias in the price index of a good, and a corresponding downward bias in the resulting measure of the 'real' magnitude of a quantity of such goods. In a path-breaking study encompassing hundreds of individual goods, Robert Gordon (1990) argues that the official price indexes for durable goods, including capital equipment, are systematically biased upward by inadequate adjustments for quality change and by the failure to distinguish selling prices from list prices. Although he is unable to make any adjustments for the prices of structures, his reconstruction of the price index for capital equipment shows that it declines almost 3 per cent a year relative to the official index, from 1947–83. Because equipment figures much less prominently in GDP than in the capital stock, this one adjustment alone sharply lowers the measured real output-capital ratio. Gordon shows that over this interval, whereas official price indices yield a real output-capital ratio with virtually no trend, his own price measures

lead to a real output-capital ratio which *falls* by 31 per cent.[37] It is interesting to note that Gordon, who is a prominent neoclassical economist, is not afraid to argue that the 'productivity of capital' falls substantially, while Brenner, a prominent Marxist historian, shrinks from the very prospect (p. 11).

So, in the end, Brenner may be right in this one respect only: factors other than technical change may well account for a significant part of the decline in manufacturing prices relative to those of capital goods. However these turn out to be rooted not in the Smithian over-competition of manufacturing firms but rather in the statistical under-evaluation of their capital goods.

Summary and conclusion

Robert Brenner has produced a large and somewhat erratic work on the post-war history of the advanced capitalist world. Its turbulence arises not only from the events which he analyses, but also from the contradictions within his own analysis. What makes the work difficult to read is that the arguments involved appear in different sections, are sometimes implicit rather than explicit, and can be contradictory. Nonetheless, it is possible to extract the logical core which drives it.

Brenner's central goal is to explain how and why the long post-war boom in the advanced capitalist world gave way to an equally long period of stagnation and decline. This is the traditional stuff of crisis theories, and the literature is rife with theoretical and historical accounts. In recent years, more and more writers have recognised that profit rates have fallen secularly across a broad spectrum of advanced capitalist countries, and have concluded that this phenomenon plays a central role in the post-war rhythms of global capitalist accumulation. It is in this group that Brenner now locates himself.

The empirical evidence reveals that falling nominal output-capital ratios account for the great bulk of the falling rates of profit, in all countries and in all periods (Table 1). Brenner acknowledges this (p. 136), but he is concerned to fend off any claim that this

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[37] Gordon 1990, p. 550. One implication of Gordon's work is that even greater biases may exist in the measurement of structures, which would further accelerate the measured fall in 'real' output-capital ratios. Indeed, it is perfectly possible that such additional corrections to price measures might lead to output prices which *rise* relative to capital goods prices, which would yield a real output-capital ratio which falls even more rapidly than the nominal one.

supports Marx's theory of the falling rate of profit. Within Brenner's own theoretical framework, such an interpretation is excluded. And so he forced to account for the evidence by some other means. A great deal of his narrative therefore centres around his attempt to root the fall in profit rates in an outbreak of excessive competition among world-wide manufacturers between 1965–73. This, he claims, sharply reduced *relative* manufacturing prices (recall that this was a period of general inflation), thereby reducing manufacturing profitability and driving down the global rate of profit.

The trouble is that this explanation immediately runs into severe difficulties. At a theoretical level, he admits that a fall in the relative price of a particular sector cannot cause a fall in the general rate of profit, because the losses to the sellers are gains to all buyers, particularly those in the other sectors. At the same time, within the 'consensus' theoretical framework which he adopts, technical change always raises the rate of profit, so that only an excessive rise in real wages can produce a secular fall in the profit rate. Brenner tries to combine the two propositions by claiming that the fall in relative manufacturing prices ended up raising real wage growth beyond some critical rate. From this point of view, it is inter-capitalist struggle, not inter-class struggle, which over-enriched workers and precipitated a global slowdown.

However, when he comes to the empirical evidence, he himself shows that real wages do not rise excessively, and even decline relative to productivity in crucial periods. So, at this point in his narrative, he switches gears and reverts to Adam Smith's thesis that a fall in one sector's rate of profit can drag down the general rate of profit. Unfortunately for Brenner, Ricardo and Marx demonstrated long ago that Smith's 'adding up' theory of profit is not consistent with industrial profit, ie. with profit arising from a surplus product. Given Brenner's stringent criticisms of the Smithian errors of other writers, it is somewhat ironic that he pins his own hopes on a well-known Smithian error.

Brenner also uses the notion of falling relative manufacturing prices, this time relative to those of capital goods, to try to explain away the uncomfortably Marxian finding that it is rising capital-output ratios (the monetary equivalent of rising ratios of dead-to-living labour) which drive the falling profit rates. He notes that real output-capital ratios fall less than the nominal ones, which leads him to conclude that it is an exogenous fall in relative prices which accounts for the difference. But, here, he not only misrepresents my argument on this issue, but even misunderstands the logic of his own theory. In both frameworks, investment decisions affect *both* relative prices and the nominal output-capital ratio. The real output-capital

ratio is simply the joint product of these two changes, and insofar as technical change lowers a sector's price relative to that of its capital goods, the real output-capital ratio will decline less than the nominal. There is nothing problematic about this, *per se.*

Indeed, to establish that relative prices are the prime factor behind falling nominal output-capital ratios, Brenner would have to show that bulk of the fall in relative prices is due to some factor *other* than technical change. This is precisely why his narrative depends so crucially on his over-competition thesis. But here the trouble is that the fall in the price of manufacturing relative to capital goods is a general phenomenon in every country. Moreover, in the US, it starts well before Brenner's critical 1965–73 period, and continues well after (Figure 7). Excessive competition is neither necessary nor sufficient to account for such patterns. Indeed, Robert Gordon has argued that this secular fall in US manufacturing prices, which is equivalently a secular rise in the relative price of capital goods, is actually a statistical artefact. This is because official estimates of the prices of capital goods have tended to be biased upward due to inadequate adjustment for quality changes and to the fact that list prices are frequently used in place of actual selling prices. His own corrections reverse the picture altogether.

In the end, Brenner is unable to bridge the gaps in his own analysis. On the one hand, he finds that falling nominal output-capital ratios account for the great bulk of the fall in global profit rates, just as Marx would have predicted. But his theory insists that this is impossible. On the other hand, his theory says that only an excessive rise in real wages could have produced secularly falling profit rates. But his empirical evidence shows that this is not so.

And, so, Brenner faces a seemingly irreconcilable opposition between theory and empirical evidence. But this is an illusion, because it is his particular theoretical framework, rooted in the neoclassical theory of perfect competition, which is the source of the difficulty. It is this approach which leads to the conclusion that technical change can only raise the general rate of profit, which in turn implies that only excessive real wage increases can account for a secularly falling profit rate.

Firms choose new methods because they appear to yield higher *expected* rates of profit. *But this expectation depends crucially on the expected path of future prices.* And here, it can be shown that if firms are treated as passive neoclassical 'price-takers', so that current prices are also expected future prices, the new methods chosen by firms will always end up raising the general rate of profit, for any given real wage (the Okishio theorem). On the other hand, if, as in Marx's notion of competition, firms engage in aggressive cost- and price-

cutting, then no such result obtains. Indeed, if lower unit operating costs are generally achieved by means of higher unit capital costs (nominal capital-output ratios), the net result is a secular fall in the general profit rate even at any given real wage. Rising real wages then merely exacerbate the pre-existing tendency for the rate of profit to fall (Section IV). The two contrasting approaches can be easily distinguished by means of a simple diagram (Figure 5).

With this last step, the apparent discrepancy between the theory and the empirical evidence disappears. The Marxian theory requires only that a rise in the nominal capital-output ratio, ie. a fall in the nominal output-capital ratio, account for the bulk of the secular fall in (capacity utilisation adjusted) profit rates. *And this exactly what one finds* (Table 1).

Perhaps the greatest contribution of Brenner's work is that he brings out the contradiction between the empirical evidence and the implications of the conventional theory of competition. Had he stuck to his guns in his recognition that price-cutting is essential to real competition, he could have abandoned the conventional theory and dissolved the contradiction. But his strong attachment to the 'consensus' theory prevents him from making the necessary theoretical break, and he is forced to twist and turn to find a way out. Without success.

Data appendix

As noted in Section III of the text, most of the data used in this paper is taken from the latest version of the ISDB electronic database from the OECD, which in turn takes it from each country's national product and wealth accounts. The ISDB covers the years from 1960 to 1994-96, depending on the country involved. In the case of the US the data was extended back to 1947 using compatible estimates available from the US Bureau of Economic Analysis and, in the case of Japan, certain missing items were extracted from various OECD publications and from the *Historical Statistics of Japan*. For reasons explained in Section II, the gross capital stock was used throughout. As is standard, inflation is dealt with by adjusting profits for inventory valuation changes, and by calculating capital stocks in current replacement prices (which also permits an inflation adjustment to depreciation allowances). Finally, capacity utilisation for Japan is the manufacturing operating rate from official sources, while that for the US is based on the my own estimates derived from the studies by Foss (and from the same McGraw-Hill survey data upon which the official Federal Reserve Board measure is based. Details and the rationale for this procedure are explained in what follows.

I. Basic calculations

In the notation of the text, the basic series consists of manufacturing data (unless otherwise specified), for: P = profits = nominal net operating surplus; K = nominal gross capital stock; Y = nominal net value added; u = the rate of capacity utilisation; $Yc = Y/u$ = the nominal value of capacity output; Kr = real gross capital stock (physical items valued in prices obtaining in 1990); Yr = real net value added, and $Yrc = Yr/u$ = real value of capacity output.

In general, real (ie. constant price) measures are connected to nominal ones via corresponding price indexes, with 1990 as the base year: $Yr = Y/p$, $Kr = K/pk$, and $GDPr = GDP/py$, where p = price index of manufacturing output ; pk = price index of manufacturing capital stock; and py = the price index of total Gross Domestic Product (GDP).

From these, we can define the variable appearing in the empirical figures and tables in the text (ie. all except Figure 5, which represents a theoretical example).

Figure 1: $r = P/K$ = the observed nominal rate of profit = $(P/Y)(Y/K)$ = (profit share)•(output-capital ratio); and $rc = r/u$ = the normal capacity rate of profit = $(P/Y)•(Yc/K)$ = (profit share)•(capacity-capital ratio).

Figure 2: P/Y = the profit share in nominal output.

Figure 3: $R = Y/K$ = the nominal output-capital ratio; and $Rc = Yc/K$ = the nominal capacity-capital ratio.

Table 1: all of the variables shown in Figures 1-3.

Figure 4: p/py = the price index of manufacturing output relative to that of total GDP, for the US.

Figure 6: $Rr = Yr/Kr$ = the real output-capital ratio; $Rrc = Yrc/Kr$ = the real capacity-output ratio.

Figure 7: p/pk = the price index of manufacturing output relative to that of manufacturing capital stock, for the US.

Most variables were directly available, but net value added and profits for manufacturing were calculated, as follows.

$Y = Yg - D$ = nominal net value added, where Yg = gross value added and D = depreciation (consumption of fixed capital).

$P = Y - IBT - EC$ = nominal net operating surplus, where IBT = indirect business taxes and EC = employee compensation. IBT in turn was calculated by multiplying the published ratio of indirect business taxes to gross value added by gross value added.

II. Data sources and methods by country

The basic data is from the ISDB database of the OECD, version 98.1 (OECD 1998a). For each country, data was available or estimated for Y, IBT, EC, Yr, K, Kr, GDP, and GDPr. This was used to calculate profit (net operating surplus) $P = Y - IBT - EC$, and price indexes $p = Y/Yr$, $pk = K/Kr$, and $py = GDP/GDPr$.

i. *Germany:* data used was for West Germany only, 1960-1994, since post-unification is not comparable due to the inclusion of what was formerly East Germany. Data was directly available for Yg, Ygr, K, Kr, D, Dr, IBT/Y, and EC. This was used to calculate the manufacturing price indexes $p = Yg/Ygr$ and $pk = K/Kr$, as well as all other necessary variables. No data was available for manufacturing capacity utilisation u.

ii. *Japan:* data was directly available from 1960-96 for Yg, Kr, IBT/Y and EC. Ygr was directly available only from 1970-96, but earlier years from 1960-69 were available from BLS (1999), which matches exactly in the overlap year 1970. Manufacturing depreciation D was taken directly from the UN National Accounts (1994, Part I, Table 4.3) for 1980-94. For 1960-79, it was estimated by multiplying total consumption of fixed capital (Dtot) by the ratio of manufacturing gross output (Yg) to total GDP, where Yg was from the ISDB, GDP was from the OECD (1998) CD-ROM database, and Dtot was calculated from UN (1982, Part I, Tables 6 and 4, respectively, which list economy-wide totals and % manufacturing) for 1970-79, from UN (1974, Part I, Table 11) for 1963-69, and from UN (1970, Part I, T 9) for 1960-62. The manufacturing capital stock index pk was approximated as the implicit price deflator of gross capital formation for the *whole* economy, as calculated by taking the ratio of the nominal and real gross capital formation (OECD 1998). This estimated pk was then used to estimate the nominal gross capital stock $K = Kr•pk$, as well as to estimate real depreciation $Dr = D/pk$. Finally, manufacturing capacity utilisation in Japan was taken to be the index of the operating rate in manufacturing, as shown for 1973-96 in JSY (1998, 1993/4, Table 7-40, 1990=100), and for 1960-72 from the HSJ (1987, Vol 2, rebased from 1980=100 to 1990=100 by rescaling so that the data matches the 1973-96 series in the overlap year of 1980).

iii. *US:* all variables were available for 1960-1996, except for nominal and real gross capital stock (K, Kr), which were available only until 1993 because the most recent publications from the BEA no longer list gross stocks. The data prior to 1960, from 1947-59, was filled in by taking Yg, Ygr, IBT, and EC from BEA (1995); K and D from BEA (1993, Tables A7 and A6, respectively, which match exactly in the overlap year of 1960); and Kr and Dr from the same source after being converted from 1987-$ to 1990-$. This last set of conversions was accomplished by using the nominal and real measures of capital and depreciation, respectively, to first calculate implicit price deflators for each in 1987-$, and then rescaling these price deflators so that their values matched those implicit in the ISDB data for the overlap year of 1960. The rescaled deflators were then used to recalculate Kr and Dr in 1990-$.

Finally, a new index for capacity utilisation in the US was developed, as explained below.

Appendix B: Capacity utilisation

Capitalist accumulation is inherently turbulent, subject to a variety of conjunctural factors such as wars, economic policies, and natural events. In addition, one must account for intrinsic fluctuations encompassing a variety of cycles such as short 3-5 year inventory cycles (which we nowadays call 'the' business cycle), medium 7-11 year cycles equipment cycles (which the classicals called 'the' business cycle), and possible longer ranging from 15-20 year cycles structures cycles to 40-50 long waves (van Duijn, 1983, ch. 1). The purpose of adjusting for variations in capacity utilisation is to be able to distinguish long-term structural changes in the rate of profit from such cyclical and conjunctural fluctuations.

In this regard, it is useful to distinguish between 'engineering capacity', which is the maximum sustained production possible over some interval, and 'economic capacity', which is the lowest cost level of operation. For instance, the higher costs of a second shift may make it only most profitable to operate only one 40-hour shift a week. This would be the economic, or normal, capacity. But it may be physically feasible to operate 20 hours a day 7 days a week, for a total of 140-hrs per week. Thus an actual working week of 36 hrs would represent an economic capacity utilisation rate of 90%, but an engineering capacity utilisation rate of only 26% (Foss 1963, p. 25; Shapiro 1989, p. 184). It is the economic capacity utilisation which is relevant for capitalist decision-making, since a level persistently below 100% signals the need for a slowdown in the expansion of capacity, while a level persistently above 100% signals the need for an acceleration in capacity expansion.

The problem of estimating economic capacity would be relatively simple if one could accept the widely held (neoclassical) assumption that, except for fluctuations arising from the short (3-5 year) business cycle, capitalist economies generally operate at normal capacity. Indeed, this is the premise of the well-known Wharton method, which estimates 'capacity' as the peak output achieved in each business cycle or conjunctural fluctuation. This simply assumes that all short-run peaks in output represent the same level (100%) of capacity utilisation (Hertzberg, et al, 1974; Schnader, 1984), thereby automatically excluding the very possibility of medium and long-term variations in capacity utilisation.

A second group of estimates tries to get around this problem by relying on economic surveys of operating rates, as in those by the Bureau of Economic Analysis (BEA) and the Bureau of the Census. Here, firms are typically asked to indicate their current operating rate, ie. their current rate of utilisation of capacity. The difficulty with such surveys is that they do not specify any explicit definition of what is meant by capacity. Unfortunately, this ambiguity in turn leads analysts to interpret the data in a variety of ways consistent with their prior theoretical premises. A typical case in point is the widely used Federal Reserve Board (FRB) measure of capacity utilisation in manufacturing. It begins with a preliminary estimate of capacity by using two different surveys, one by McGraw-Hill (recently discontinued), and one by the Bureau of the Census. But in doing so, the Federal Reserve combines them in a way that it believes to be theoretically 'sensible', although it does not make public the exact procedures used or their rationale. But even after this set of adjustments to the raw data, it frequently finds that the resulting estimates of capacity utilisation are less cyclical than it finds plausible. Consequently, it further operates on its capacity estimates to make them more smooth (ie. to make them more theoretically plausible), using regressions on the capital stock and on time (Shapiro 1989, pp. 185-8). Various other adjustments are also made so as to 'move the capacity estimate from a peak engineering concept toward an economic concept' consistent with its underlying theory. It is one of the stated goals of these adjustments that the resulting measure of capacity utilisation rate is not 'chronically below 'normal' capacity utilization' (Shapiro 1989, pp.187-8). *In other words, just as in the case of the Wharton method, the operative premise here is that capitalism generally operates at or near full capacity.*

A third type of measure sidesteps the difficulties inherent in the first two by attempting to directly measure the rate of capacity utilisation. In a now classic study, Foss (1963) showed that it is possible to estimate capacity utilisation by measuring the utilisation rate of the electric motors which are used to drive capital equipment. Foss's initial estimates for selected years were subsequently developed into an annual series by Jorgenson and Grilliches (1967) and then improved and extended by Christensen and Jorgenson (1969) to cover the period from 1929-1967, and by Shaikh (1992) to cover the period from 1909-1928. But there exists a major obstacle to the forward extension of this series: namely, that the data on the installed capacity of electric motors, which is crucial to the construction of the series, was dropped after the 1963 Census. It is here that I developed a method to extend the series, by combining certain key pieces of direct survey data with existing objective series on capital equipment motor usage. The annual McGraw-Hill survey on business plans yields two crucial bits of information: the annual additions to capacity in manufacturing (DCAP), and the annual proportion of gross investment which goes toward the expansion of capacity (E). These two series are widely used in research on capacity and investment

spending, respectively (eg. Feldstein and Foot, 1971). A key point concerns the interpretation of the additions to capacity DCAP: McGraw-Hill assumed that the survey responses refer to net additions to capacity, but found that then estimated capacity measure grew much more rapidly than seemed plausible. This, combined with the fact that the prior question on the survey referred to gross investment, led other analysts to conclude that most respondents in the survey referred to gross, not net, additions to capacity (Rost, 1983).

If the survey responses of firms referred primarily to gross rather than net additions to capacity, then we could derive the true net additions by multiplying the gross additions (DCAP) by the proportion which goes towards capacity expansion (E). Cumulating these derived net expansions of capacity would give us a new index of capacity. On the other hand, if the survey response referred primarily to net additions, these could be cumulated directly (as the FRB both does and rejects). Without further evidence, it becomes a matter of choice based on other considerations. But we *do* have further evidence, at least for the first half of the post-war period, in the form of the electric motor utilisation rate by Foss and others. Therefore, to test the two competing interpretations of the survey data, I assumed that the responses contain an unknown proportion p of gross and (1-p) of net additions, and then estimated the value of p which gave the greatest correspondence between the subjective survey based measures and the objective electric motor utilisation rate, over their period of overlap from 1947-1962. Interestingly, the optimal value turns out to be p=1, so that the survey responses seem to refer to gross additions, just as Rost (1983) concludes. Using p=1 allows me to create a capacity utilisation measure from the McGraw-Hill data and then splice it to the Foss data on electric motor use to create a complete capacity utilisation series from 1947-1985 (Shaikh 1992). For the purposes of this paper, the measure was extended to 1994 by regressing my measure on the FRB measure. Additional detail is provided in Shaikh (1987, 1992), and further discussion of the subject can be found in Winston (1974), Gabish and Lorenz (1989, pp. 26-40), and Tsaliki and Tsoulfidis (1999).

Figure 8 depicts my measure (UMH1) and the Federal Reserve Board measure (UFRB). As is to be expected, the principal differences are in longer run patterns, as in the Vietnam War buildup during the 1960s, and post-Reagan profit boom from the 1980s onward. Unlike the FRB measure, mine is neither symmetrical nor stationary over the long run, and it exhibits much greater fluctuations.

Figure 8: Capacity Utilization Measures
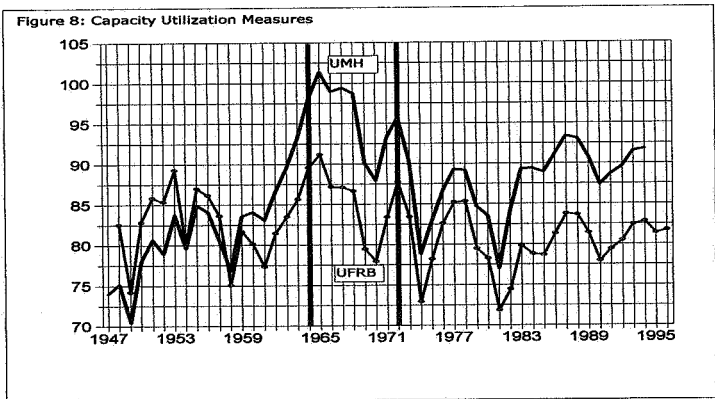
References

BEA 1993, *Fixed Reproducible Tangible Wealth in the United States, 1925-89*, US Department of Commerce.

BEA 1995, *GPO by Industry Estimates, 1947-93*, US Department of Commerce, Bureau of Economic Analysis, May (available on diskette).

BLS 1999, *Underlying Data for Indexes of Output per Hour, Hourly Compensation, and Unit Labor Costs in Manufacturing, Twelve Industrial Countries, 1950-1998, and Unit Labor Costs in Korea and Taiwan, 1970-1998*, US Dept of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, March 1999.

Brenner, Robert 1998, 'The Economics of Global Turbulence', *New Left Review*, 229: 1-264.

Callinicos, Alex 1998, 'World Capitalism at the Abyss' *International Socialism*, Winter: 3-43.

Cherry, Robert et al. (eds) 1987, *The Imperiled Economy*, New York: The Union for Radical Political Economics.

Chilcote, Edward 1997, 'Interindustry Structure, Relative Prices, and Productivity: An Input-Output Study of the US and OECD Countries', *Economics*, New York: New School for Social Research.

Christensen, Laurits R. and Dale W. Jorgenson 1969, 'The Measurement of US Real Capital Input, 1929-1967', *Review of Income and Wealth*, 15, 4.

van Duijn, Jacob J. 1983, *The Long Wave in Economic Life*, London: George Allen and Unwin.

Feldstein, Martin and D.K. Foot 1971, 'The Other Half of Gross Investment: Replacement and Modernization Expenditures', *Review of Economics and Statistics* pp. 49-58.

Fine, Ben, Costas Lapavitsas, Dimitris Milonakis 1999, 'Addressing the World Economy: Two Steps Back', *Capital and Class*, 67: 47-90.

Foley, Duncan K. and Thomas R. Miche 1999, *Growth and Distribution* Cambridge, MA: Harvard University Press.

Foss, Murray F. 1963, 'The Utilization of Capital Equipment: Postwar Compared with Prewar', *Survey of Current Business*, 43: 8-16.

Gabish, Gunter and Hans-Walter Lorenz 1989, *Business Cycle Theory: A Survey of Methods and Concepts*, second edition, Berlin: Springer-Verlag.

Gordon, Robert 1990, *The Measurement of Durable Goods Prices*, Chicago: University of Chicago Press.

HSJ 1987. *Historical Statistics of Japan, Vol 2*, Japan Statistical Association, October.

Howard, Michael C. and John E. King 1992, *A History of Marxian Economics*, Princeton: Princeton University Press.

Jorgenson, Dale and Zvi Griliches 1967, 'The Explanation of Productivity Change', *Review of Economic Studies*, 34.

JSY 1998, 1993/4. *Japan Statistical Yearbook*, Statistics Bureau, Management and Coordination Agency, Government of Japan.

Nakatani, Takeshi 1979, 'Price Competition and Technical Choice', *Kobe University Economic Review*, 25: 67–77.

Negeshi, Takashi 1987, 'Monopolistic Competition and General Equilibrium' in *The New Palgrave: A Dictionary of Economics*, edited by John Eatwell et al., London: Macmillan.

Ochoa, Edward 1988, 'Values, Prices, and Wage-Profit Curves in the U.S Economy', *Cambridge Journal of Economics*, 13, 3: 207–208.

OECD 1998a, *Intersectoral Database (ISDB)*, Version 98.1.

OECD 1998b. Country data available on CD-ROM.

Okishio, Nobuo 1961, 'Technical Changes and the Rate of Profit', *Kobe University Economic Review*, 7: 85–99.

Pratten, Clifford F. 1971, *Economies of Scale in Manufacturing Industry*. Cambridge: Cambridge University Press.

Roberts, John 1987, 'Perfectly and Imperfectly Competitive Markets', in *The New Palgrave: A Dictionary of Economics*, edited by J. Eatwell, et al., London: Macmillan.

Rosdolsky, Roman 1977, *The Making of Marx's 'Capital'*, London: Pluto Press.

Rost, Ronald F. 1980, 'New Federal Reserve Measures of Capacity and Capacity Utilization', *Federal Reserve Bulletin* pp. 515–21.

Schnader, Marjorie H. 1984, 'Capacity Utilization', in *The Handbook of Economic and Financial Measures*, by Frank J. Fabozzi and Harry I. Greenfield, Illinois: Dow-Jones Irwin.

Shaikh, Anwar 1978, 'An Introduction to the History of Crisis Theories', in *US Capitalism in Crisis*, New York: URPE.

Shaikh, Anwar 1978, 'Political Economy and Capitalism: Notes on Dobb's Theory of Crisis', *Cambridge Journal of Economics*, 2: 233–251.

Shaikh, Anwar 1980, 'Marxian Competition versus Perfect Competition', *Cambridge Journal of Economics* 4.

Shaikh, Anwar 1984, 'The Transformation from Marx to Sraffa: Prelude to a Critique of the Neo-Ricardians', in *Marx, Ricardo, Sraffa*, edited by E. Mandel, London: Verso.

Shaikh, Anwar 1987, 'The Falling Rate of Profit and the Economic Crisis in the US' in *The Imperiled Economy*, edited by R. Cherry et al., URPE: Book I.

Shaikh, Anwar 1989, 'The Current Economic Crisis: Causes and Implications', *Against The Current* pp. 1–26.

Shaikh, Anwar 1990, 'Surplus-Value', in *The New Palgrave: Marxian Economics*, edited by J. Eatwell et al., London: Macmillan.

Shaikh, Anwar 1992a, 'A Comment on "The Value Controversy Reconsidered" by Itoh', in *Radical Economics*, edited by B. Roberts and S. Feiner, Boston: Kluwer Academic Press.

Shaikh, Anwar 1992b, 'The Falling Rate of Profit and Long Waves in Accumulation: Theory and Evidence', in *New Findings in Long Wave Research*, edited by A. Kleinknecht, E. Mandel and I. Wallerstein, London: Macmillan.

Shaikh, Anwar and E.A. Tonak 1994, *Measuring the Wealth of Nations: the Political Economy of National Accounts*, Cambridge: Cambridge University Press.

Shapiro, M. 1989, 'Assessing the Federal Reserve's Measures of Capacity and Utilization', *Brookings Papers on Economic Activity*, 1: 181-241.

Sraffa, Piero 1963, *Production of Commodities by Means of Commodities*, Cambridge: Cambridge University Press.

Tsaliki, Persefoni and Lefteris Tsoulfidis 1999, 'Capacity Utilization in Greek Manufacturing', *Modern Greek Studies Yearbook*, 9: 127-42.

UN, 1994 and various other years, *National Accounts Statistics*, Part I, United Nations.

US Department of Commerce, B.E.A. 1998, *Fixed Reproducible Tangible Wealth 1925–96*, Washington, DC: Government Printing Office.

URPE 1978, *US Capitalism in Crisis*, New York: Union for Radical Political Economics.

Weston, John F. and Eugene F. Brigham 1982, *Essentials of Managerial Finance*, Chicago: Dryden Press.

Winston, Gordon C. 1974, 'The Theory of Capital Utilization and Idleness', *Journal of Economic Literature*, 12, 4: 1301-1320.