The Australian Rate of Profit, 1965 - 2001

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Abstract

This exploration of the long run development of Australian capitalism focuses on the average rate of profit and its decomposition into profit share and capital productivity. This decomposition is described in some detail in terms of its components' contribution to a dramatic decline in trend profitability from the mid-1960s to the mid-1980s, and its recovery thereafter by the end of the century. Particular stress is placed on the productivity variables and on how they impact on profitability.

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1 Introduction

Over recent years considerable effort has been devoted to the attempt to describe the macroeconomic evolution of developed capitalist economies in terms which are broadly consonant with a Marxist theoretical framework. While there has often been disagreement as to the precise specification of that framework and what is thereby implied for measurement of its categories, nevertheless a growing body of work focused on the USA (for example Duménil and Lévy (1993, 2002) and Wolff (2001)) has established the following propositions:

- the average rate of profit fell sharply from the early 1960s, more than halving by the early 1980s;
- both declining profit share and declining productivity (of both labour and capital) are important contributory factors to this decline;
- from the early 1980s to the present the average rate of profit has recovered, but by less than half of the previous fall;
- an important contributory factor to this recovery has been an improvement in capital productivity.

These appear to be long run (structural) rather than short run (cyclical) features. The first 20 or so years describe what Duménil and Lévy (1993) term a 'trajectory à la Marx', with falling productivity, rising composition of capital and a falling rate of profit. The second 20 years or so see some reversals of these trends, prompting a proposal that the (mild) recovery of profitability coupled with the evident domination of finance in the last years of the twentieth century is marking the establishment of a new phase of capitalist development (Duménil and Lévy (2001)).

This paper describes the Australian rate of profit and its decomposition over the same period. It is important to specify this carefully. Work in the Marxian tradition on the rate of profit generally presupposes an underlying theory of accumulation, decomposes the rate of profit into a ratio of the rate of surplus value to the value composition of capital, presumes that such value categories can unproblematically be measured by price data, and then shows that the empirical data either confirm or fail to confirm the theory. However, the Marxist tradition in the second half of the twentieth century has often been weak in describing the empirical trajectories of 'actually existing capitalism'. Much theorising has tended to occur within an empirical vacuum, and, conversely, empirical analysis has too often had at best a tenuous theoretical underpinning. This paper seeks to contribute to overcoming this weakness by describing the empirical data in a theoretically informed way, following the approach suggested by Foley (1982) and surveyed in Mohun (1994).

But its description is limited in an important way. The decompositions used below are properly only techniques that describe the data in more detail. While Marxist economic theory certainly suggests how a causal structure of determination can be applied to the decompositions, this is undeveloped here. In particular, the decompositions are not aligned to classical Marxian variables, for that would require a careful consideration of how the data described can be mapped into the categories of productive and unproductive labour. This is a major task, which is left for future research. For this reason, no reference is made to that Australian literature that does explicitly employ Marxian variables (Jüttner and Murray 1983, Gibson, Graham and Shakow 1989, Kuhn and O'Lincoln 1989, Kuhn 1993, and Doughney 1999), for the issues thereby raised are more properly treated as part of that further research.

The next section considers the centrality of profitability in the analysis of capitalism, and this is followed by a section that describes the behaviour of the average rate of profit in Australia. It finds similar long run developmental tendencies to those described in the US studies.[1] The pre-tax net rate of profit fell from a peak of 16.2% in 1969 to a trough of 6.5% in 1983, and then recovered to reach 13.4% by 2001. Decomposing the rate of profit into the product of profit share and capital productivity, and expressing the data in trend terms, a falling profit share contributed about 46% and falling capital productivity about 54% to the decline in profitability. In the upswing of the rate of profit, these proportions were almost exactly reversed. By the end of the century, the rate of profit was somewhere between its 1971 and 1972 levels, the profit share between its 1970 and 1971 levels, and capital productivity between its 1973 and 1974 levels. The rate of profit was then some 86%, the profit share 96% and capital productivity about 89% of their values at the start of the period. The general pattern is thus very similar to that exhibited by the US economy, but the Australian recovery is stronger. The following two sections examine the behaviour of the profit share and capital productivity in more detail and a concluding section summarises the findings. An appendix to the paper outlines some of the measurement issues involved.

2 The Centrality of Profitability

The measurement implications of the classical/Marxian approach adopted here contrast with the measurement concerns of orthodox neoclassical theory. The methodological individualism of neoclassical economics focuses attention on 'welfare' derived from consumers' utility. Participation in markets

[1] To avoid clumsiness in the expression of dates, all dates refer to the period covering the preceding twelve months to June. Hence 1968/69, for example, is written as 1969.

is voluntary, and people engage in market transactions order to acquire commodities that enhance welfare through their consumption. If the goal is welfare enhancement and its means is consumption, then consumers are deemed by their actions to reveal what adds to utility. But current production constrains what is available for present and future consumption. It follows that the central category of orthodox macroeconomics is the level of current production, and how it is divided between consumption goods (for current consumption) and investment goods (for future consumption), or, in complementary manner, how the factor incomes derived from current production are divided between current consumption expenditures, and savings (for future consumption). The measure of this central category is Gross Domestic Product (GDP).

While GDP ideally is an account that attaches a monetary measure to whatever is utility-enhancing, inevitably there are compromises, determined by the feasibility and practicability of measuring first, economic activity that does not go through the market, and second, that which does but which is problematic in some regard. Hence the correspondence in practice between GDP as measure of output and GDP as measure of welfare is imperfect, and measuring output is not a sufficient condition for accurately measuring welfare. But it is a necessary one: output is produced for consumption and consumption generates utility.

Contrasting with these neoclassical concerns, the questions of classical economic theory, including Marxist economics, do not revolve around issues of welfare maximisation. Rather, they are concerned with how much surplus is produced and in what form, and how it is extracted from those who produce it. These are not comfortable questions for neoclassical economics. It is true that the latter sometimes uses the word 'surplus'. For example, consumers earn a 'surplus' if the price that they actually pay for a good is less than the maximum price that they would have been prepared to pay. Producers earn a 'surplus' if they receive a price that is greater than the minimum price at which they would have been prepared to supply the good. But these notions of consumer and producer surplus arise out of the individualistic framework of neoclassical economics. They only derive their meaning from the determinants of the slopes of individual demand and supply schedules. In contrast, the notion of a surplus in classical economic theory is a social construct, bound up with notions of class and class conflict, and not therefore easily representable as the outcome of decisions made by optimising individuals.

This contrast between economic agents as optimising individuals and economic agents as 'bearers' of class relations has a further implication. In neoclassical economics, individuals are price-taking utility maximisers constrained by whatever their endowments happen to be. In such constrained

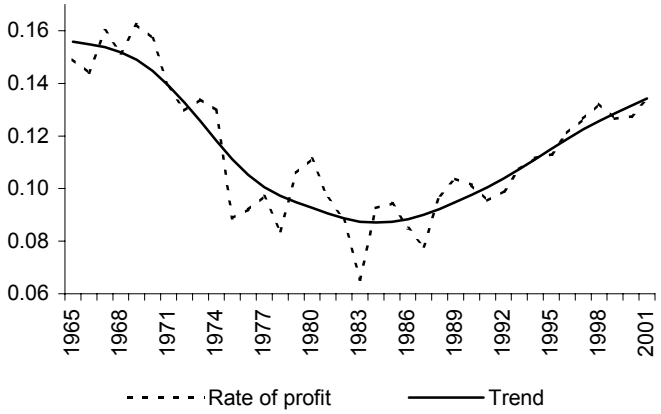
circumstances, their (given) preferences determine their actions, and the market signals transmitted by their demands for output and supplies of factors interact with (constrained) profit maximising firms' demands for factors and supplies of outputs to determine prices. But since production is only undertaken in order for output to be sold and consumed, there is a presumption that consumer sovereignty is at the ontological heart of the economy. The surplus-based frame of reference, reaching its apogee in the work of Marx, is quite different. Money is advanced as capital purely in order to make more money, which is taken as profit. The purpose of production is to make a profit, and consumer demand is shaped and manipulated as far as possible towards this end. Firms compete with one another to make more profit, and more profitable firms will starve less profitable ones of investment, and drive them into bankruptcy. In this manner, pursuit of profit rather than any notion of 'consumer sovereignty' is what ontologically drives the economy.

Since large firms will tend to create more profit than smaller ones, profitability must be scaled by assessing it relative to the capital stock in which money is tied up. Each individual firm thereby earns a rate of profit, whose weighted sum is the average rate of profit for the economy as a whole. How this average rate of profit for the economy as a whole changes over time is therefore a key summary statistic of capitalist development. In contrast to the neoclassical vision, a theory whose vision is of a society characterised by class conflict over the production and appropriation of the surplus entails that the central category of macroeconomics is not GDP and its components, and their growth over time, but the average rate of profit and its trend over time. Hence a focus on profitability is the central organising theme in any survey of particular periods in the history of a capitalist economy. The first step is to describe trends in the average rate of profit, and, through some appropriate decomposition, to broaden that description to encompass trends in the proximate determinants of profitability. The second step is to use such descriptions in the elaboration of behavioural hypotheses concerning the dynamics of a capitalist economy. This paper is limited to the first of these two steps.

3 The Rate of Profit and its Decomposition

The average net pre-tax rate of profit (henceforth, rate of profit (r)) over the last third of the twentieth century is illustrated in Figure 1. The rate of profit peaked at 16.2% in 1969. It then fell steeply in two phases. During the first half of the 1970s, it lost some 45% of its value, falling to 8.9% by 1975. It then stabilised, and indeed rose to 11.1% by the end of the decade. There was then a second steep fall to a trough of 6.5% in 1983, followed by a mild recovery with quite large fluctuations until the end of the 1980s. Thereafter the 1990s saw a much more sustained recovery, from 9.9% in 1991 to 13.2% in

Figure 1: *Pre-Tax Average Net Rate of Profit and Trend, Australia 1965-2001*



1998 and to 13.4% in 2001. In longer run trend terms, the rate of profit fell by some 44% to a trough in 1984; it subsequently rose continuously to the end of the century, by which time it had regained its 1971/72 level, but was two and a quarter percentage points below its mid-'60s trend value.

Formally, the rate of profit is the ratio of profits (Π) to the capital stock (K), where profits are the difference between total value added in money terms (hence Money Value Added, or MVA) and total wages. In order to describe in more detail the trends in the rate of profit, it is useful to consider the rate of profit as the product of the share of profits in MVA, and the 'productivity' of capital:

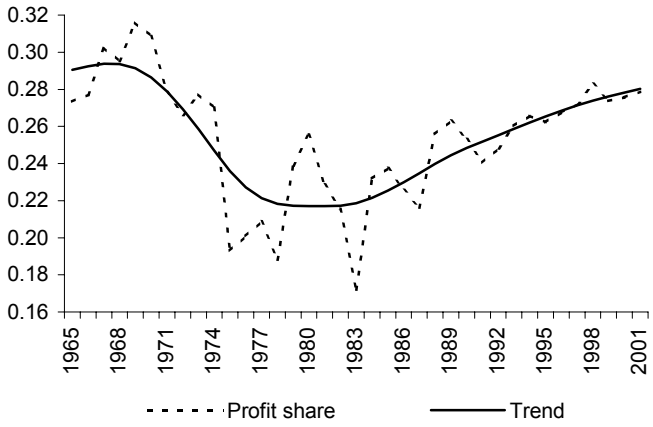
$$r = \frac{\Pi}{K} = \frac{\Pi}{MVA}\frac{MVA}{K} \tag{1}$$

The ratio of MVA to capital stock K is commonly termed 'capital productivity' (by analogy to labour productivity). While the nomenclature 'capital productivity' does some linguistic violence to the presupposition that only labour creates value, it is, for better or for worse, a well-established term. Because the measurement of capital productivity is invariant to any distributional change between wages and profits, equation (1) is often used because it appears to separate those proximate factors operating on the rate of profit involving distribution (the profit share) from those involving technology (capital productivity). These issues will be considered in turn.

3.1 The profit share

The share of profits in MVA is shown in Figure 2. Both actual and trend values peaked in the late 1960s (1969 and 1967 respectively) and then fell to a trough in the early 1980s (1983 and 1981 respectively) before recovering to their 1970/71 values by the end of the century. The time profile of the profit share is thus similar to that of the rate of profit, although in trend terms the trough was

Figure 2: *Share of Profits in MVA, Actual and Trend, Australia, 1965-2001*

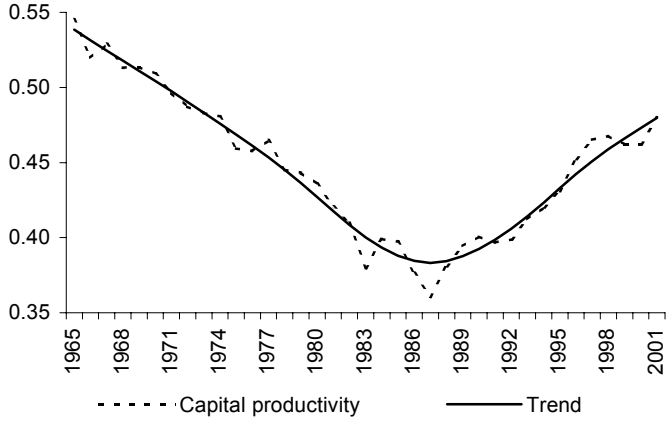


both earlier and more prolonged. Indeed, while the trend trough was in 1981, the trend profit share hardly moved between 1978 and 1983.

3.2 Capital productivity

The series for capital productivity is shown in Figure 3. There are three noteworthy features. First,

Figure 3: *Capital Productivity, Actual and Trend, Australia, 1965-2001*

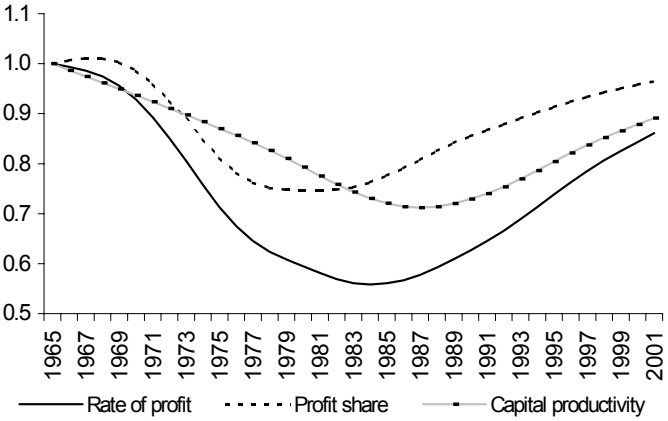


the annual data underlying the trend fluctuated much less than that for the profit share. Second, the trough occurred in 1987, some six years later than the trough in the profit share. Third, the recovery in capital productivity by the end of the century, compared with its initial level, was not as comprehensive as that for the profit share.

3.3 Initial summary

Figure 4 illustrates the trends in profit rate, profit share and capital productivity, each indexed to its own 1964/65 level. Three periods can be distinguished.

Figure 4: *Rate of Profit, Profit Share and Capital Productivity, Trends, Australia 1965-2001, 1965=1*



Mid-'60s to early '80s (1965-1984) Falling profit share and falling capital productivity both contributed to the fall in the rate of profit, and almost equally. The falling profit share accounted for about 46% of the fall in profitability, and falling capital productivity about 54%.

Mid-'80s (1984-1987) A rising profit share compensated for falling capital productivity, and the rate of profit began to rise.

Late '80s to the end of the century (1986-2001) A rising profit share and rising capital productivity both contributed to the rise in the rate of profit. In contrast to the falling phase, rising capital productivity contributed a little less than the rising profit share: the latter accounted for some 54% of the rise in profitability, whereas rising capital productivity accounted for about 46%.

It is worth emphasising that a focus on the behaviour of the profit share only accounts for about half of the movement in profitability. The behaviour of capital productivity is just as important. Hence both profit share and capital productivity merit more detailed consideration.

4 The Profit Share

Consider first the following decomposition of the profit share. Profits are the difference between total value added and total wages. Total value added (MVA) is the product of a price index (p_{mva}) and real money value added ($RMVA$). Total wages (W) are the product of a wage rate per hour (w) and the total number of hours worked (H). That is,

$$\frac{\Pi}{MVA} = \frac{MVA - W}{MVA} \tag{2}$$

and so

$$\frac{\Pi}{MVA} = \frac{p_{mva}RMVA - wH}{p_{mva}RMVA} \tag{3}$$

Dividing through by the price index and the number of hours worked,

$$\frac{\Pi}{MVA} = \frac{\frac{RMVA}{H} - \frac{w}{p_{mva}}}{\frac{RMVA}{H}} \tag{4}$$

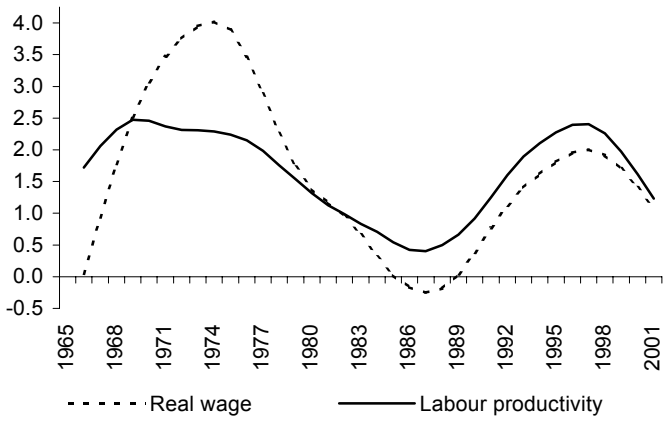
Thus the profit share is the difference between real money value added per hour of labour worked ($RMVA/H$), which is a measure of labour productivity, and the real (product) wage (w/p_{mva}), all expressed as a proportion of labour productivity.[2] Hence as long as the *level* of labour productivity exceeds the *level* of the real wage (as long, that is, as the *level* of profits is positive), the direction of the rate of change of the profit share is determined by the difference between the rate of change of labour productivity and the rate of change of the real wage.[3] If the rate of growth of labour productivity exceeds that of the real wage, the profit share will rise. Conversely, if the rate of growth of the real wage is greater than that of labour productivity, then the profit share will fall. Annual rates of growth of these two series are very volatile, and so only their smoothed time trends are shown in Figure 5, in which these propositions are illustrated.

In trend terms, for just over a decade, from 1969 to 1981, the annual rate of growth of the real wage exceeded the annual rate of growth of labour productivity. By contrast, for two decades after 1981 the annual rate of growth of labour productivity exceeded the annual rate of growth of the real wage. Thus movements in the profit share turn on the comparison between the forces determining productivity

[2]Deflating the money wage by the GDP deflator defines the real (product) wage. A real wage expressing command over consumption goods would require deflating the money wage by the implicit deflator for households' total final consumption expenditure. While the latter is appropriate for the study of living standards, the former is more appropriate for the study of the profit share.

[3]This is established by differentiating equation (4) and expressing the outcome in proportional rates of change.

Figure 5: *Trend Rates of Growth of Labour Productivity and the Real (Product) Wage, Australia, 1965-2001*



change in the production process and the forces determining nominal wage and price changes in labour and product markets. While Figure 5 is only another way of describing the movement in the profit share, there are several features of interest in the trends of both annual real wage growth and annual labour productivity growth.

4.1 Real wage growth

As regards trend real wage rates of growth, three features are apparent in Figure 5.

1. Real wage growth peaked in 1974, which marked the maximum difference between real wage growth and productivity growth. Indeed, while the trending procedure hides contingent peaks and troughs, it is worth noting that the actual profit share collapsed by 7 percentage points (i.e. by about a quarter) in the one year 1974 to 1975, during which the actual real (product) wage increased by 11.6%.[4] But thereafter the trend rate of growth of the real wage fell. This was partly accomplished by rising unemployment, which doubled in the mid-'70s and then doubled again by the mid-'80s, with the average duration of a spell of unemployment rising from 13 weeks in August 1975 to 35 weeks in August 1981 and to 49 weeks in August 1986.

2. Trend real (product) wage growth was less than 1% p.a. from 1982 to 1991, and was negative for the three years from 1986 to 1988. Overall during these ten years it averaged 0.25% p.a.,

[4]Conventional economic commentary at the time expressed concern about this more rapid growth in wages than in labour productivity in terms of a 'real wage overhang', a 'real wage gap', and excessive 'real unit labour costs' (INDECS 1992, pp. 75-77).

a decade during which wage bargaining was dominated by a succession of agreements between the trade union movement and the government intended to deliver wage restraint in exchange for economic and employment growth. These ('Accord') agreements eventually oversaw a determined shift from centralised wage bargaining mechanisms to decentralised bargaining procedures at enterprise level underpinned by a centrally determined floor of awards and safety nets. Since their net effect did indeed deliver wage restraint, they were obviously beneficial to corporate profitability.

3. Trend real wage growth rose through the first half of the 1990s to peak in 1997 before falling back for the remainder of the decade. This more rapid growth can be interpreted as a lagged response to the productivity gap and the real wage falls of the previous decade, and was facilitated by (small) falls in unemployment and by the productivity margin of the 1990s. The rise was not associated with any increase in industrial militancy (measured by days lost through industrial disputes). Indeed, the decade also saw a more aggressive shift towards decentralised bargaining and non-unionised individual workplace contracts.[5]

4.2 Productivity growth

As regards trend productivity rates of growth, there are two striking features in Figure 5.

1. The trend rate of growth of labour productivity averaged over 2% p.a. over the decade from 1967 to 1976. It then fell steadily to 0.4% in 1987.[6] This is the 'productivity slowdown' following the 'golden age' of the 1950s and 60s, and is a (largely unexplained) feature of all developed capitalist economies.

2. In the late 1980s and especially the 1990s there was an acceleration of productivity growth, recovering its pre-productivity slowdown levels between 1994 and 1998. It is tempting to attribute this to the influence of the microeconomic 'reforms' of the labour market.[7] But this acceleration

[5]For surveys of Australian labour market experience, see Stegman (1999), Burgess, Mitchell and Watts (1999) and Campbell and Brosnan (1999). Current methods of setting pay are outlined in *Australian Social Trends 2002* on the basis of the May 2000 ABS Survey of Employee Earnings and Hours. See also OECD (2001, pp. 90-8).

[6]The ANA series (5204.0, Table 21) displays a similar shape and the same turning points but at a higher level at least until the late 1980s. The difference is due to the different definitions of the variables used to define labour productivity.

[7]Dowrick (1999, pp. 17-20) is sceptical, because, according to his study, hours of work in the 1990s barely increased, and one would have expected greater efficiency in resource allocation to be accompanied by faster growth of both outputs and inputs, neither of which he finds. Yet the different definitions of this paper do find faster growth in real MVA

is not unique to Australia. For the US economy the phenomenon has been much discussed in terms of the acceleration of investment in computer software and hardware (for example Oliner and Sichel (2000), Gordon (2002) and Stiroh (2002a, 2002b)), but there is no consensus as to conclusion.

4.3 A summary

The extent (or rate) of productivity growth puts bounds on what real wage growth is possible if the profit share is not to fall. Figure 5 shows a very poor productivity performance over a decade after 1976, followed by an improving productivity performance for a further decade, which in turn appears to have come to a halt in the late 1990s. Given this productivity growth record, the real wage growth that occurred in the 1970s was compatible only with a falling profit share. From 1981 and for the rest of the century, trend real wage growth was below trend productivity growth. Real wage growth patterns are explicable in terms of lagged responses to productivity growth in excess of real wage growth, unemployment pressures, and state action to limit the extent of perceived trade union power. But productivity growth patterns require further investigation, because they are important not only in the explanation of the profit share but also in the explanation of capital productivity, the other component of the rate of profit.

5 Capital Productivity

Nominal capital productivity can be decomposed in the following manner. Since the capital stock (K) is the product of a price index (p_k) and the real capital stock (RK), then

$$\frac{MVA}{K} = \frac{p_{mva} RMVA}{p_k RK} = \frac{p_{mva}}{p_k} \frac{RMVA}{RK} \tag{5}$$

and dividing through by the number of hours worked,

$$\frac{MVA}{K} = \frac{p_{mva}}{p_k} \frac{\frac{RMVA}{H}}{\frac{RK}{H}} \tag{6}$$

Hence nominal capital productivity is the product of two terms: a price variable and a real variable. The price variable is a relative price, the price of output relative to the price of fixed capital. When it falls, fixed capital is becoming more expensive relative to output and so nominal capital productivity

during the 1990s, and while the levels of growth rates are different, their pattern is similar to that shown in OECD (2001, p. 77).

falls; and conversely for when it rises. The second term, the real variable, is the ratio of labour productivity to the real fixed stock of capital per hour worked, where the real fixed stock of capital per hour worked is a measure of 'capital intensity'. Then the rate of growth of capital productivity is determined by the sum of

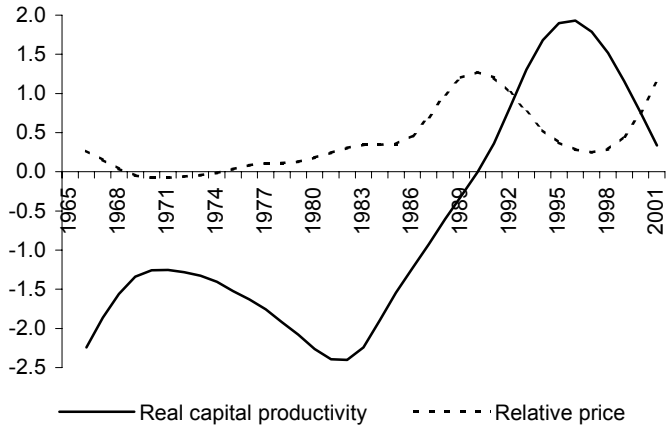
- the rate of growth of the price of output relative to the price of fixed capital, which is the difference between the rate of growth of the GDP deflator and the rate of growth of the implicit price deflator for fixed capital,

and

- the rate of growth of 'real' capital productivity, which is the difference between the rate of growth of labour productivity and the rate of growth of capital intensity.

Trend rates of growth in real capital productivity and relative prices are illustrated in Figure 6.

Figure 6: *Trend Rates of Growth in Real Capital Productivity and Relative Prices, Australia, 1966-2001*



5.1 Prices

The contribution of trend relative price rates of change divides into three distinct periods.

1. From the mid-'60s to the mid-'80s, the effects on the rate of growth of nominal capital productivity arising from the trend rate of growth of relative prices were very small. They were positive and rising from the mid-'70s to the mid-'80s, so that capital was becoming steadily relatively cheaper, but in growth rate terms the effect had only risen to 0.35% by the mid-'80s, and in

general this positive effect was overwhelmed by the strongly negative effects contributed by the trend rate of growth in real capital productivity.

2. During the second half of the 1980s this positive effect accelerated, to peak at 1.3% by the end of the decade, and this strong rise was sufficient to outweigh the negative effects in the second half of the 1980s contributed by the trend rate of growth in real capital productivity, so that nominal capital productivity began to rise from its 1987 trough.

3. For most of the 1990s, the trend contribution of relative price change to the rate of change of nominal capital productivity fell back to its early 1980s level, but remained positive, and then accelerated again at the end of the decade.

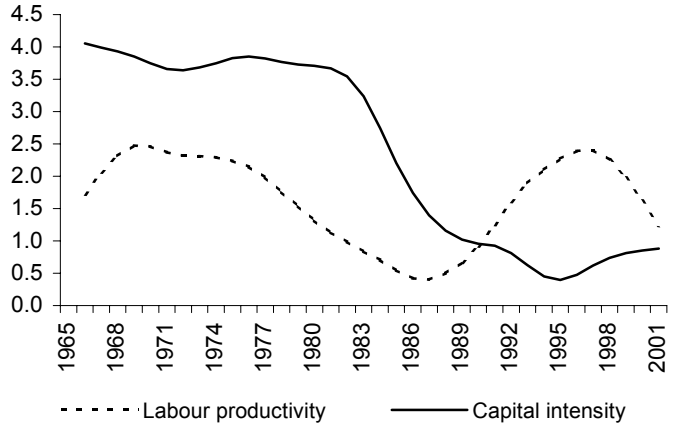
5.2 Real capital productivity

The contribution of the trend rate of growth of real capital productivity to the trend rate of growth of the rate of profit was negative from the mid-'60s for some 25 years, and, for the decade of the 1970s (through to 1982), the contribution was increasingly negative. From 1982, the trend rate of growth of real capital productivity was rising, but starting from a trough of -2.4% it took almost a decade (until 1991) before it became positive. It continued to rise until the mid-'90s, peaking at 1.9%, and then it fell back sharply. Hence the growth rate of nominal capital productivity was dominated by the growth rate of real capital productivity over the whole period, except for the period from 1988 to 1992.

The importance of real capital productivity can be considered further by exploring the decomposition of equation (6), whereby the rate of growth of real capital productivity is the difference between the rate of growth of labour productivity and the rate of growth of capital intensity. The reason for this exploration is that increases in capital intensity are 'classically' the way in which labour productivity increases are achieved. The two rates of growth are illustrated in Figure 7. The dotted labour productivity line is reproduced from (the solid line in) Figure 5. The rate of growth of real capital productivity (in Figure 6) is reproduced as the vertical distance in Figure 7 between the dotted line representing the rate of growth of labour productivity and the solid line representing the rate of growth of capital intensity.

The capital intensity graph has three distinct segments. From 1965 through to 1982, capital intensity grew at an average annual rate of 3.8%. There was then a sharp transition over five years, which was followed by the much lower average annual growth rate of 0.7% from 1988 to the end of the century. Hence

Figure 7: *Trend Rates of Growth of Labour Productivity and Capital Intensity, Australia, 1966-2001*



- through the 1970s the broadly constant (high trend) rate of growth of capital intensity was combined with a steadily falling rate of growth of labour productivity;
- for the decade following 1988, the broadly constant (low trend) rate of growth of capital intensity was combined with a strongly rising rate of labour productivity growth;
- for the second half of the 1990s, the trend rate of growth of capital intensity remained approximately constant at its lower level, while labour productivity growth rates fell sharply.

It is therefore not the case that increases in capital intensity drove labour productivity, at least in any simple manner. This suggests further investigation of two related areas. First, from the mid-'80s there have been large investments in ICT (information and computer technology, both hardware and software) which have had major compositional effects on the capital stock. Annual growth rates in the volume of investment in computer hardware were running at over 33% p.a., and in software at over 20% p.a., right through the 1990s, so that, by 2000, more than 20% of all non-building investment was accounted for by investment in computer hardware and software, compared with about 6% in 1986 (Gruenwald *et al.* 2001, p. 10). Hence it is possible that the rising rate of growth of labour productivity is attributable to the greater efficiency, and possibly to the positive network externalities, implied by the growing use of computer technology.

Secondly, much of the practice and most of the rhetoric of Australian economic policy in the last two decades of the twentieth century has involved emphases on 'microeconomic reform', 'economic rationalism' and 'deregulation', with associated robust emphasis on the benefits of individualism coupled with trenchant denunciation of any residual maintenance of a collectivist ethic by the labour movement. Both legal and informal encouragement has thereby been given to reorganisations of the

labour process, and this can entail productivity growth that is not associated with any acceleration of capital intensity. Citing work that attributes only one third of the productivity growth of the late 1990s to the production and use of ICT, the OECD concluded in 2001 that

> "structural reforms undertaken in Australia during the past two decades were instrumental to the accelerated growth of overall productivity in the 1990s, even in the absence of an unambiguous direct link between particular microeconomic reforms on the one hand and productivity outcomes on the other." (OECD 2001, p. 82)

It is likely that the combination of ICT investment and the changing legal and regulatory framework have combined to provide some spur to reorganisations of production, which have played a significant role in raising labour productivity growth rates. On the other hand, the same trends have also encouraged growth in precarious employment, wage dispersion, and the fragmentation of working-time arrangements, so that the lower rates of growth of capital intensity in the 1990s are likely to have been accompanied by direct increases in labour intensity. Hence disentangling the sources of increases in labour productivity deserves further investigation.

5.3 A summary

From the capital productivity side,

1. the fall in the rate of profit to the mid-'80s was entirely driven by the fall in real capital productivity;

2. the rise in the rate of profit in the second half of the 1980s was due to favourable relative price effects;

3. as regards the 1990s effects on the rate of profit, the rate of growth of real capital productivity continued to predominate over that of relative prices, although increasingly less so in the second half of the 1990s.

Since the rate of growth in capital intensity was broadly constant at a higher level, and then (after a transition) broadly constant at a lower level, the falling level of real capital productivity appears to be driven by falling labour productivity growth, and the rising level of real capital productivity by rising labour productivity growth. The puzzle, however, is the association of falling labour productivity growth with the higher growth rates of capital intensity, and rising labour productivity growth with lower growth rates of capital intensity. This focuses attention sharply on the need for further research

to explain the growth rate record of labour productivity, and its relation to the growth rate record of capital intensity.

6 Conclusion

The celebration of the virtues of the free market is a celebration of the virtues of capitalist competition, and capitalist competition is a struggle for profitability fought ultimately through innovation and technical change, for it is through these latter that labour productivity is increased. Classically, technical change is a process of 'capital-deepening', of equipping each hour of labour with increasing quantities of fixed capital in real terms. But this will only thereby yield additions to profitability if labour can be prevented from appropriating to itself the extra output produced. Labour productivity, that is, has to be 'high enough'.

Improving profitability requires that a rising profit share dominate any falling trend in capital productivity. For this to occur, labour productivity growth rates have to exceed real wage growth rates by enough to counteract any tendency of falling capital productivity. In these terms, the two decades from the mid-'60s were a disastrous period for the trend rate of profit. Thereafter, given the steady fall in labour productivity, recovery in the profit share required serious restraint in the rate of growth of the real wage, and this was indeed delivered through the 1980s. But the rising profit share during the first half of the 1980s was dominated by continually falling capital productivity. Only after the mid-'80s did this situation change. In the second half of the 1980s, the profit rate rose because of the rising profit share and because of relative price changes favourable to rises in nominal capital productivity. Real capital productivity only began to rise in trend terms from 1991. That is, through the 1990s, in trend terms, labour productivity growth rates exceeded capital intensity growth rates, and this dominated profitability in the 1990s. The key variable is therefore labour productivity, and the key facts to be explained are its fall from the late 1960s to the mid-1980s, and its rise thereafter to the late 1990s.

Since the mid-1970s, a war of attrition by capital on the working class and its labour market institutions has been fought with increasing success. Through the 1980s, this was marked by the shift from wages to profits. But thereafter, that shift was reinforced by rising capital productivity. For from the late 1980s, the growth in capital intensity required to achieve a significant recovery in labour productivity growth was dramatically lower than had been the case for the two decades following the mid-1960s. While the changing nature of technology played some role, it was also the case that continued working class defeats rendered reorganisations of the labour process rather easier

to effect. The combination of capital logic and class struggle were therefore mutually reinforcing. But class conflict is a dynamic process, and historically contingent outcomes are never final. For if capital deepening is the source of labour productivity, the investment in non-labour inputs required to raise labour productivity always risks driving down capital productivity. Moreover, state-sponsored attacks on labour movement organisations and traditions in the absence of real wage increases are unlikely to be successful in the long term in permanently raising labour productivity, for they raise long run difficulties about legitimacy in liberal democracies. Yet the real wage increases that might be required to persuade workers to alter working practices always risks driving down the profit share. How these issues evolve will determine the next phase of the evolution of Australian capitalism.

A Appendix: Data Sources, Measurement Issues and Trends

A.1 Data sources

Australian National Accounts (ANA) data (ABS 5204.0) is a combination of what is available electronically from <http://www.abs.gov.au> and what can be found in annual ANA printed volumes. Useful data is also available from <http://www.rba.gov.au>. In addition to what is available electronically from ABS, labour market statistics are primarily from ABS 6204.0 *The Labour Force Australia Historical Summary, 1966 to 1984*; *The Labour Force Australia Historical Summary, 1978-1989*; *The Labour Force Australia, 1978-1995*; annual volumes to 1997 of ABS 6101.0 *Labour Statistics;* and OECD *Labour Force Statistics 1965-1985, 1970-1990* and *1979-1999.* While many detailed adjustments have been made to the data to construct usable time series, these are not listed here. However, major conceptual issues are outlined below.

A.2 Measurement

A.2.1 The measurement of net output

Gross domestic product (GDP) is too inclusive a category to represent total value added, or total new value created, for three reasons. First, it includes an estimate of depreciation (consumption of fixed capital, or that annual expenditure necessary to maintain the capital stock at its current level), which averages 16% of GDP over the period. While it is usual to work with gross rather than net figures because depreciation expenditures in national accounts are relatively unreliable, this must be balanced against the fact that depreciation does not reflect the money form of any additional value created.

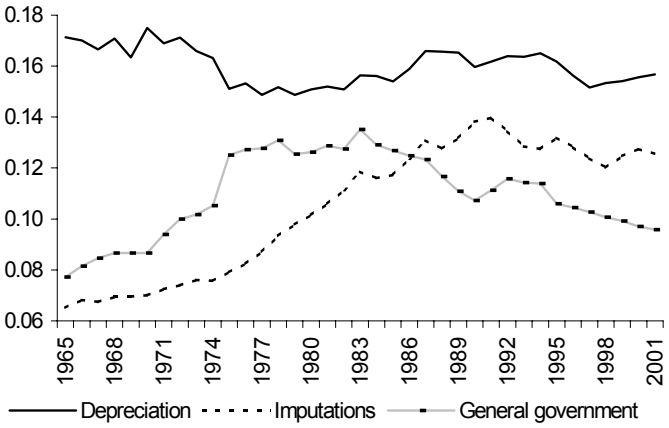
Second, GDP includes a set of imputations, a valuation of product that does not enter the market but is considered to reflect additional productive activity, which averages 10.2% over the period. The most important imputation in the ANA is the rent that owner-occupiers are deemed to pay to themselves for housing services provided. Without an estimate for imputed rent, GDP would fall whenever a renter leaves the rental market and purchases a property for owner occupation, even though there is no change in the quantity of housing services provided. While imputing rent is meaningful on a use-value basis, it makes little sense in terms of new value produced. The ANA also impute an interest charge for services provided by financial institutions for which no explicit charge is made, and estimate the farm consumption of farm output. Like imputed rent, neither of these imputations

should be included in an estimate of aggregate value added.[8]

Third, public consumption (health and social services, education, defence, police, judiciary, fire services etc.) is financed out of taxation revenues, rather than through sale in the market. While there is some charging for some services, the revenues raised are small as a proportion of the total cost of provision. This output cannot then be valued at market prices, because there are none, and in the ANA it is measured at its cost of provision, which is deemed to be the total compensation (wages, salaries and supplements) paid to employees of 'general government'. This amounts to an average of 10.8% of GDP over the period. While the inclusion of general government in GDP makes sense if its purpose is to describe the provision of use-values, it cannot be justified from the perspective of the creation of new value.

Were these components of GDP to be constant proportions of GDP, then no adjustment would be necessary, for time trends in GDP could be used to consider time trends in new value created. But Figure 8 shows that the proportions are not constant. While the coefficient of variation of depreciation

Figure 8: *Proportions of GDP, Australia, 1965-2001*

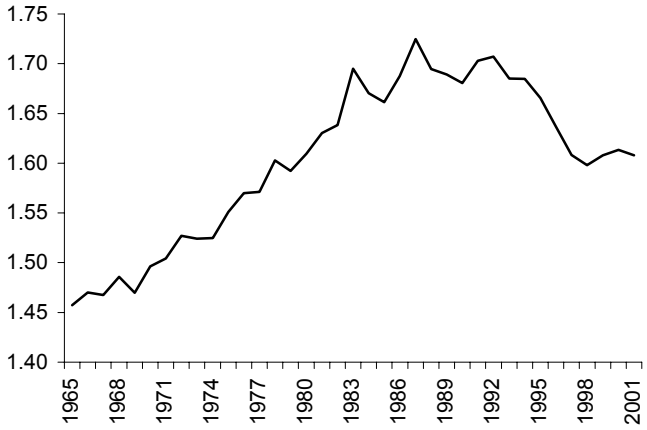


as a proportion of GDP is only 4.6%, that of general government is 15%, and of imputations is 25%. Hence aggregate value added must be considered explicitly. Call aggregate value added 'money value added' (MVA), where MVA is defined as equal to GDP less depreciation, imputations and compensation of general government employees. Figure 9 shows the time trend of overestimation of

[8]Other imputations included in the ANA are income received in kind (such as private use of company cars and other such 'fringe benefits'), value added by owner-builders in the construction of and alterations and additions to dwellings, and non-farm output produced and consumed by the same person. Lack of published data means that these (rather smaller) imputations are not considered in this paper.

MVA by GDP.

Figure 9: *GDP as a proportion of MVA, Australia, 1965-2001*



A.2.2 The measurement of wages

Since the focus is on the measurement of the surplus, the category 'wages' must be measured to include all related costs of employing labour: wages, salaries, supplements and employers' payments into superannuation funds. All of these are included in 'employee compensation'. However, there are also 'employers' (owners of unincorporated enterprises, ordinary partnerships and sole proprietorships, typically employing only small numbers of people) and 'own account workers' (the self-employed) to consider. Whereas in the US and the UK no distinction is made between employers and self-employed, there is such a distinction made in Australian statistics at industry level electronically after 1984 (and in printed sources after 1978). However, the lack of complete data over the period and the desirability of maintaining international comparability combine to suggest a common treatment of self-employed and employers. There are three choices. Either their total earnings can all be included as labour income. Or they can all be accounted for as profit. Or they can be split in some manner between wages and profits. The problem with either of the first two procedures is that their earnings are plainly mixed, so that adopting either procedure will import substantial errors into subsequent estimates of profitability. This is because the self-employed and employers are numerically significant. The self-employed amount to around 10% of total employment over the period, and employers constitute 5.2% of total employment in 1984, falling to 3.6% by 2001. Hence some 13-15% of the employed labour force is involved.

The procedure adopted here is to split the income of the self-employed and employers into a

wage component and a profit component. Despite the apparent absurdity that they thereby exploit themselves, the rationale is that such people can always choose to join the labour market as employees, and hence the opportunity cost of not doing so is their foregone employee compensation. For each year of the sample, and for each major industry group identified in the Standard Industrial Classification, an average labour income per employee is determined by dividing total employee compensation by the total number of employees. Multiplying this average labour income per employee in each major industry group by the total numbers of self-employed and employers in that industry group estimates the wage component of the income of the self-employed and employers in that industry group.

Two further points should be noted. First, the very small number of 'unpaid family helpers' are excluded from this study, precisely because they are unpaid. Second, in the calculation of total labour income in each major industry group, the compensation paid to general government employees is excluded.

A.2.3 The measurement of profits

Profits are the difference between MVA and total wages as just defined. Two points in particular should be noted. First, defining profits as the aggregate of all non-labour incomes is a very inclusive definition of profits. It includes, for example, all (actual, rather than imputed) rental and interest payments as a part of profits. This inclusivity is motivated by the theoretical presumption that all non-labour factor payments are components of the sum of value that is produced by labour, but appropriated by capital, and subsequently divided through market transactions between the component fractions of capital (industrial, landed, financial and commercial).

Second, profits are here defined as pre-tax. This is obviously inadequate if the aim is to explain capitalist behaviour. But the requirements of the state's taxation regime, the determination of how much to distribute as dividends to shareholders and the determination of investment are all demands on the division of the surplus. In this sense, the pre-tax measure of profits is appropriate for a long run analysis, because it determines what else is possible.

Duménil and Lévy (1993) have a similar argument. They suggest that a long run analysis

> "begins with technology and wages, accounts progressively for the impact of institutions, such as the financial system or the state, includes, at some point, inventories and financial assets and, thus, moves from a rather simple definition to a more concrete framework, closer to the actual behaviour of firms." (Duménil and Lévy 1993, p. 30)

In particular, while considerations of resource allocation (determined by investment flows according to

differential profitability between firms and industries) and of macroeconomic stability (which operates through firm behaviour) require an after-tax definition of profit for their analyses, such analyses are more concrete and subsequent to the long run analysis of the determination of pre-tax profitability by technology and wages. This long run approach is followed here.

A.2.4 The composition and measurement of the capital stock

There are a considerable number of conceptual and practical difficulties with the capital stock. These concern what precisely should be included, and how what is included should be measured.

Composition Since this study is concerned with the profits earned on invested capital, that capital should exclude the residential capital stock owned by households. By the same token, it also excludes the general government capital stock. What remains, however, is more than the fixed capital stock owned by nonfinancial and financial corporations, since the household sector owns more capital stock than just residential dwellings. The fixed capital stock then comprises non-residential buildings and structures, machinery and equipment, computer software, assets concerned with mineral and petroleum exploration, livestock, and artistic originals.

However, money is tied up in more than just the fixed capital stock. What also should be included, but is not, is the capital tied up in inventories (finished stocks and work in progress). Armstrong *et al.* remark in their study (1991, p. 347) that, the case of the USA apart,

> "what data are available suggest that the ratio of stocks to net fixed capital varies little either over time or across countries, being about one-third of the value of fixed capital for both manufacturing and total business."

To this extent that this is true for Australia, while the level of profitability will be overestimated by the exclusion of the circulating capital elements of the capital stock, its time trend will be relatively unaffected.

Measurement Since the measure of MVA excludes depreciation, so too must the capital stock. This implies that a measure of net rather than gross capital stock is required. The gross fixed capital stock is calculated according to the perpetual inventory method, whereby the flows of gross investments less discards per year are cumulated. This method values capital assets at their inflation adjusted initial cost throughout their lifetime; there is no depreciation at all over asset lives until the very end, when they depreciate all at once. With such a method of valuation, it is difficult to embrace the ideas

of technical change accelerating the depreciation of fixed assets, and of the devaluation of fixed capital as part of the resolution of a crisis. Furthermore, discard schedules are based on average economic conditions, and they are therefore inappropriate for the investigation of long run trends that change those conditions. For these reasons, it is more appropriate to measure the fixed capital stock in net rather than gross terms, by replacing discard schedules with depreciation schedules.

A.3 Trends

The data are filtered using the procedure suggested by Hodrick and Prescott (1997). This involves a choice of value for the smoothing parameter, which involves an *a priori* decision concerning a compromise between the distance of the variable from its trend and the curvature of the trend. There is no 'correct' choice. Thus for example the default value of the smoothing parameter for annual data in the *EViews* (version 3.1) software package is 100; on the other hand, in order to construct a long run trend over 120 years for the USA, Duménil and Lévy (1993, p. 223) use a value of 5000. For Australia, the series in this paper that are the most volatile are the annual rates of growth of the real wage, of productivity, and of capital intensity. The choice made here is to take the smallest value of the smoothing parameter that eliminates a short-lived acceleration of real wage growth at the end of the 1970s. On this basis, a smoothing parameter of 35 has been used for all series.

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