

Another Productivity Paradox? The  
Accord and Recent Productivity  
Trends in Australian Manufacturing

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A productivity mentality is being encouraged across a wide spectrum of Australian industries and enterprises. Productivity growth is being facilitated through the auspices of award restructuring under the Accord, through the general range of policies associated with microeconomic reform and through increases in public expenditure on training and education. The fears of increasing external debt, industry closure, increasing unemployment and declining living standards are being used to encourage all parties to participate in this productivity enhancement process. It is clearly in the interests of capital and labour for productivity growth to occur, the distribution of the benefits and costs associated with productivity improvements remain less clear cut.

This paper will examine the recent productivity performance in Australian manufacturing. This sector is selected for a number of reasons: more comprehensive data is available, the sector has been signalled out as needing to lift its performance if Australia's external position is to improve, it has been subject to more research scrutiny than any other sector and it assumes strategic importance in the current train of award restructuring where part of the rationale is to lift labour productivity growth rates. This will then be followed by a review of the evidence on productivity determinants for manufacturing. Finally, the implications and contradictions are examined in the context of the Accord.

The primary contention of this paper is that the emphasis on labour costs and efficiency evident in the Accord cannot, by itself, improve manufacturing productivity. Paradoxically the evidence suggests that the Accord has contributed to lowering the growth rate in productivity. The recent Australian manufacturing productivity experience replicates the scenario outlined by Skinner (1986) for the American manufacturing sector. In his influential paper, Skinner (1986) argued that corporate strategies which attempted to improve labour efficiency and utilization were at best focusing only on 20 percent of the potential sources for productivity enhancement:

"Resolutely chipping away at waste and inefficiency - the heart of most productivity programmes - is not enough to restore competitive health. Indeed, a focus on cost reductions is proving harmful." (1986: 56)

The majority of productivity gains were to be obtained from outside of labour costs and efficiency, notably through investment in plant, equipment and technology. As mentioned elsewhere (see Burgess, 1989) there is a real danger in Australia of an over-emphasis upon microeconomic reform and cost reducing supply side measures to the relative neglect of important demand side and macroeconomic factors which impact upon productivity growth.

## THE CONCEPT OF PRODUCTIVITY

There are a number of productivity concepts. In general terms it is output per unit of input. The most common term is labour productivity, or output per person employed or per person hour of employment. However, efficiency concerns concentrate upon the growth in productivity through time. In this case labour productivity growth refers to the difference between output growth and the growth in labour input. Labour is not the only input into the production process. The major other productive input is capital, hence capital productivity refers to the difference between output growth and growth in the capital input. Total factor productivity is output growth less the combined growth in inputs, where the inputs are

weighted by their respective factor shares in output. Alternatively, labour productivity can be represented as the growth in total factor productivity plus the change in the capital-labour ratio. To concentrate upon labour productivity is misleading to the extent that it excludes the contribution of other inputs to output generation.

If productivity is increasing then firms can produce more with their productive inputs. The unit costs of production will fall, and under competitive conditions product prices will decline. In an international trading context productivity performance is an important determinant of international competitiveness.

## THE DISTRIBUTIVE QUESTION

In static terms, labour productivity increases will involve both real income gains and potential income losses. If firms can produce the same output with fewer employees, then one of the consequences of productivity growth will be unemployment. The real income gains can be distributed between capital, employed labour, consumers or government (through taxation). The essential point is that while productivity growth is in general desirable it does pose both distributive and equity questions for the community. For example, potential generators of productivity growth (displaced labour) are clearly worse off as a result of the process.

Another problem is that the sources of productivity gains are neither enterprise nor sector exclusive. That is, the productivity gains in one sector may be the result of investment and efficiency improvements in other sectors. For example, improvements in labour productivity in the private road transport sector as a result of public freeway construction. Productivity growth may also only be the consequence of the exercise of market power via higher product prices. The ability to exercise discretionary pricing power in product markets may explain inter enterprise and inter sector differences in labour productivity growth.

Questions related to the distribution of the gains from productivity growth has been recently discussed by Isaac (1989) who favours a distribution via lower product prices, with the size of any dispersement to wages being determined more by national productivity growth as opposed to industry productivity growth. The whole issue of distribution is complex and divisive. The Australian wage system has favoured a national distribution of productivity gains on equity grounds, though the appropriate measure for such purposes is problematic (see the Report of the Working Party on Productivity, 1976). The national distribution of productivity gains was central to the 1986 national wage case, however, more recently the focus has switched towards productivity generation and distribution at the enterprise level under award restructuring.

To focus upon productivity as a wage determination principle has a number of problems. First, there are a multitude of problems associated with the measurement of productivity (to be discussed below). Second, there are the problems associated with the identification of the sources of productivity growth - this has a bearing on rewards and distribution. Third, there are problems for the non market and trade sectors. The non market sector does not generate an output which has a market value, consequently productivity measurement takes on additional difficulties. The trade sectors have their output values influenced by exchange rates and world commodity markets. Fourth, the issue equity; how should productivity gains be distributed between workers in the same enterprise, across different enterprises and sectors, to those not in employment, and between labour and capital. This is especially difficult given the sectoral interdependence associated with productivity generation and the implicit contribution of labour and capital displacement towards productivity growth. Fifth, the implications associated with a distribution of the productivity gains for macroeconomic problems such as inflation and the current account deficit. Finally, the observation that wage differences are not related to productivity differences within enterprises and between occupations (see Brown, 1989). To focus upon the distribution of productivity gains incorrectly assumes that the current wage and salary structure accurately reflects differences in productivity levels.

These above issues and dilemmas are pertinent to the process of award restructuring where in principle enterprise productivity bargaining is being encouraged, but within nationally set parameters.

## MEASUREMENT AND METHODOLOGICAL ISSUES

Productivity estimates are likely to be a combination of hope, guesses, brazenness and good luck. The number of problems and assumptions associated with generating estimates compound each other to render the results very suspect. On the side of caution it is more reliable to follow Schott's recommendation (1984: 270) and consider longer term trends when the errors cancel each other out and to not use short term productivity growth as an indicator of anything, let alone efficiency or wage determination. Often the periodic surge or slowdown in productivity growth is eventually eliminated through statistical revisions. Different measures produce different results; for example, Harris and Lattimore (1989: 16) note that total factor productivity growth in Australian manufacturing for the 1980's can range between 2.1 and 0.2 percent per annum depending upon which sets of data from a large range of potential permutations for different estimates of output, labour input and capital stock are selected.

Output is best measured in physical terms where units are homogeneous. Unfortunately output is not homogeneous, firms are likely to produce more than one product; there are even problems with measuring output in an industry with apparent homogeneous physical units such as bricks (see Burgess, 1981). Some sectors produce only services, that is, there is no physical dimension to their output. Output is thus measured in value terms which in turn involves such potential problems as double counting, inflation, and qualitative changes. The accepted measure is real value added, but there are price index problems, especially with inputs, and quality changes tend to be ignored. The public sector poses special problems because it does not generate a market valued output; nevertheless, productivity enhancement is just as important an issue for the public sector.

Labour input tends to be measured in terms of labour hours. Using persons employed may misrepresent the growth in the input, especially given recent changes in the composition of employment between full time and part time employment. There are a number of labour series each differing in their focus (employers or employees) and their period of collection. The labour input represents an average stock of labour per period based on discrete observations such as every month. It is implicitly assumed that the quality of labour is constant as is the degree of labour utilization.

Capital input represents the greatest unknown in any estimation procedure. Even if the theoretical doubts are eschewed (see Harcourt, 1972) there are innumerable problems. Capital in use consists of a range of disparate machines, plants, buildings etc. subject to differing degrees of usage, obsolescence and depreciation. The vintage of capital differs significantly. This disparate mass has to be combined into one measure with allowance being given to inflation. Recognition has to be given to that fact that some capital is owned and some of it leased. Capital itself is not used in production, but it does generate a flow of services which have to be valued.

When combining labour and capital inputs to estimate total factor productivity, their weighting is problematic. At best it is based on heroic assumptions (see Kregel, 1972: ch.4), at worse some ad hoc estimates.

To compound the problems other traps await the uninitiated. Productivity tends to be cyclical, hence the time period of selection tends to be important. If you start from a recession, then the productivity results are flattering as has occurred with the UK

productivity experience in the 1980's (see Rowthorn, 1989). If you start from a boom the productivity record is poor. With aggregate measures the results are affected by structural change, this is an important aspect when considering aggregate productivity trends. A structural shift in production and employment from sectors with low productivity levels to sectors with high productivity levels will increase average productivity levels. The reverse applies for shifts from relatively high productivity to relatively low productivity sectors. The shifts in Australian employment from the relatively high productivity manufacturing and agricultural sectors to the relatively low productivity service sectors have depressed average labour productivity growth rates.

Productivity is the residual which is left unexplained after accounting for the growth in inputs. Deridingly it is referred to as our measure of ignorance. Total factor productivity is sometimes referred to as technical change - suggestive of the effects of productivity growth upon the unit costs of production. However, there is nothing stopping the analysis going further and attempting to identify and quantify those sources which explain this technical change apart from the primary inputs. Such exercises in growth accounting have their measurement and methodological problems compounded (see Maddison 1987; Nelson 1981), but the range of additional variables is extensive and includes such factors as research and development expenditure, catch-up effects and qualitative changes in labour and capital.

## RECENT PRODUCTIVITY PERFORMANCE IN THE MANUFACTURING SECTOR

Hopefully the appropriate degree of caution has been encouraged. The productivity performance of Australian industry has recently been under fire from a number of quarters (see Clark 1989; Moore 1989; Business Council, 1989). Especially emphasised has been the apparent failure of the Accord and microeconomic reforms to generate any demonstrable improvement in productivity performance. In recent years there has been a plethora of studies on Australian manufacturing productivity (see BIE 1986; EPAC 1989; Hughes et al, 1990). A brief summary of the major findings is presented below. The data, time periods and methodology of analysis do differ between the various studies.

### ABS National Accounts (1990)

This provides estimates for labour productivity only. It is subject to revision, especially for recent periods. The following data represents the growth rate in real gross product per hour worked for recent years with the trend rate from 1974/75.

	Trend 1985/6 %	1986/7 %	1987/8 %	1988/9 %	%
market sector	2.1	2.1	1.6	1.6	1.9
manufacturing	3.0	2.8	1.4	1.2	3.8

The latest figures provide a turn around from the previous 2 financial years. In general the labour productivity growth rate for manufacturing has been consistently above the national average for the market sector and for the economy as a whole. On a sector basis for 1988/89 the highest rate of growth was recorded by the utilities (such as electricity generation) at 8.2 percent while construction recorded a decline in labour productivity of 3.7 percent. Within the manufacturing sector the textile industry recorded negative productivity growth of 1.5 percent while the basic metals industry recorded productivity growth of 14.6 percent.

## OECD (1989)

Labour productivity growth rates are regularly published for the member economies. Part of the recent summary result for the manufacturing sector is as follows.

	1960-73 %	1973-79 %	1979-88 %		
OECD	5.2	2.4	3.7		
Australia		2.2	2.6	2.7	
UK	3.6	0.6	3.8		

In general the Australian growth rate in labour productivity for the manufacturing sector has been consistently below the OECD average. The mid 1970's (post OPEC) saw a significant productivity slowdown across most OECD economies (see Maddison 1979). Australia did not share this experience. The end of the boom in post war labour productivity growth in manufacturing occurred much earlier in Australia during the 1960's (see BIE, 1986). On the UK productivity miracle the point has been made (see Rowthorn, 1989) that this decade's performance comes off dismal performance for the 1970's; total manufacturing output for the UK reached its 1979 level in 1988.

## EPAC (1989)

A number of commissioned studies were used to review the productivity performance of the Australian economy. Both measures for labour and total factor productivity were provided, with international comparisons. With respect to the manufacturing sector the comparative estimates for total factor productivity growth were as follows.

	1960-73 %	1973-79 %	1979-85 %		
Australia		2.1	1.7	0.4	
OECD	4.5	1.5	1.8		

A similar trend in relation to the OECD average for labour productivity growth for Australia is observed in the 1960's and 1970's for total factor productivity, the 1980's however represents a significant slowdown. The EPAC paper does highlight the significant differences present in the range of estimates from the commissioned studies.

The data so far has summarised productivity growth rates. The EPAC paper also reported on relative productivity levels for a number of sectors. International comparisons of productivity levels are subject to a range of problems, one of the greatest being the effects of currency movements. The relevant data for manufacturing, with Australian output per person as a ratio of the OECD average output per person, is as follows.

	1967-73	1981-86		
largest 14 OECD economies		0.86	0.85	
6 smallest of the above	1.07	0.92		

Relative labour productivity levels in Australia generally have declined. Nevertheless, apart from the USA, the estimates indicate that Australian productivity levels in manufacturing are comparable to those in the majority of OECD economies.

Hughes, Burgess, Dunlop (1990)

This study points to a significant slowdown in recent labour and total factor productivity growth for manufacturing. The observations are bi-annual, the recent growth rates were:

	labour productivity %	total factor productivity %		
1986/7	0.8	-0.2		
0.5	1.1			
1987/8	0.8	1.5		
0.1	1.2			
1988/8	-0.2	-	0.3	-

The data on the capital stock estimates are only available to 1987/88. The points to emphasize are that for recent observations the capital productivity growth was significant, the consequence being that total factor productivity growth exceeded labour productivity growth. This is quite unusual in post war manufacturing experience. While the recent growth in labour input has been strong, the capital stock has stagnated and even declined.

There are many other studies which have not been reported on. For example, the Bureau of Industry Economics has released several reports over the last 5 years on productivity growth for the Australian manufacturing sector (see Harris, 1989). More recently they have moved from aggregate analysis towards enterprise and plant evaluation. Extensive publicity (Australian Financial Review, 1990) surrounded the analysis of productivity levels across four Kodak plants, where it was found that the Australian plant lagged behind the efficiency levels achieved in similar plants in Brazil, Malaysia, the UK and Canada. Despite many measurement and methodological problems, some commonality in results can be observed for the 1980's with respect to manufacturing labour productivity growth in Australia. First, manufacturing labour productivity growth has been consistently above the recorded growth rates for the total private sector in Australia. Second, Australia has been consistently below the OECD average growth rate. Third, despite the recent ABS data, there was a slowdown in labour productivity growth from the mid 1980's. Fourth, recent

figures point towards an improvement in total factor productivity and in total factor productivity exceeding labour productivity growth.

Examination of the trends in the data on output and input reveals the following trends. Output: a severe recession in 1982/3, but real output growth thereafter. Labour input: a slight decline in both hours and employment, with both measures indicating similar labour productivity trends. Capital input: strong initial growth (the early 1980's 'resources boom') followed by relative stagnation and decline (the average age of equipment increased steadily). The overall picture for the decade is of the manufacturing sector producing about 20 percent more output with about the same labour input and a slightly larger capital stock. Evidence of improving efficiency, whether of sufficient speed and extent is open to debate.

## DIAGNOSING THE LONGER TERM TRENDS

Growth rates in themselves may be interesting, what is important is analyzing the factors generating particular productivity outcomes. From the BIE studies (Harris, 1989) the following general observations emerged with respect to the period 1954/5-1981/2:

- (a) technical change in Australian manufacturing in the post war period has been largely labour augmenting; that is, enterprises have attempted to economise on the use of labour through the substitution of capital (this trend would seem to have been reversed by recent experience).
- (b) in the 1950's and 1960's economies of scale had an important bearing on productivity growth, this effect was diminished in the 1970's and 1980's where technological improvements have been more important- this has implications for industry policy which favours mergers and rationalization as a vehicle towards productivity improvement.
- (c) productivity growth is cyclical following on from the proposition known as Verdoorn's law (see Whiteman, 1986); recessions generate poor productivity growth, booms generate strong productivity growth.
- (d) the majority of productivity gains were passed on in the form of higher wages to the employed workforce.
- (e) demand growth and the average age of plant seemed to be the major determinants of differences in inter-industry productivity growth rates. Relatively higher productivity growth rates were recorded in those sectors with relatively higher output growth and more modern plant and equipment.

## A PRODUCTIVITY SLOWDOWN FOR AUSTRALIAN MANUFACTURING DURING THE 1980'S?

There is no clear answer to the question. In terms of decade averages, labour productivity growth is higher than the 1970's. In terms of the position relative to the OECD average growth rate there has been a decline. Output per person or per person hours has increased, the rate of growth in labour productivity has on average been greater, but as compared with other economies the growth rate is lower. However, it should also be noted that the oil price shocks of the 1970's had a much greater impact on average OECD output and productivity growth than they did for Australia. Most OECD economies were coming back from a relatively poor decade whereas the Australian productivity growth actually improved in the 1970's. A slowdown in the recent 3-4 years though is noted by Hughes et al (1990) for labour productivity growth. Total factor productivity is below its previous decade average but has recently been above labour productivity growth. In their analysis of productivity growth 1970/1-1988/9 Hughes et al (1990) found that the apparent recent slowdown was largely explained by the falls in real unit labour costs associated with the Accord. Whether this represents a utilization/economising effect or a substitution effect is canvassed in the paper. It should be noted that the slowdown was associated with declining equipment/labour ratios and an ageing capital stock; that is, technical

change appears to be capital augmenting as opposed to labour augmenting in earlier periods.

## COMPARATIVE PRODUCTIVITY LEVELS

As mentioned earlier, comparative productivity levels were in the news following the comparisons between similar Kodak plants internationally (see Australian Financial Review, 1990). The Australian plant did not fare well. This follows on from a range of similar studies looking at international comparisons (see Haig, 1986; EPAC, 1989). Two points need emphasising: there are a multitude of factors impinging on productivity - often simplistic views as latched on to such as restrictive work practices, incompetent management etc to explain inter-plant or international differences; second, such studies look at levels of productivity and are comparing static efficiency - that is, it may be possible for plants to better utilize their productive inputs and generate a once off efficiency improvement; however, attention to determinants of productivity growth or the rate of technical progress through time is also important.

Following on, the other popular international comparison is that of comparing rates of growth in productivity (as presented earlier). Such comparisons are interesting but should be used with caution. Firstly, contextual factors differ between economies - cyclical, structural, and utilization rates. Second, levels as well as growth rates are important - the catch up views on technology highlight this (see Maddison, 1987). For example, average Japanese labour productivity levels in manufacturing are still significantly below those in the USA, even though Japanese growth rates are much higher than the USA for the entire post war period. Third, productivity growth is uneven and irregular; time periods become important (see the UK decade performance for the 1970's and 1980's).

International comparisons can be instructive if the suitable degree of caution is applied in their interpretation and analysis. For example, the Australian manufacturing sector would appear to suffer from disadvantages of small scale and insufficient research and development expenditure as compared to other advanced Western economies. However, evidence from the BIE (1986) suggests that scale economies are not as important as they previously were. Also, Australia directly imports technology through franchising arrangements; is the development or application of technology more important in terms of influencing productivity growth?

## THE ACCORD AND PRODUCTIVITY GROWTH

The Accord has contributed to a slowdown in productivity growth for the reasons outlined above. If it is assumed that the index of real unit labour costs approximates the movement in relative input prices (this seems reasonable in the context of the impetus given to capital costs from the mid 1980's currency depreciation and the continuation of high real rates of interest), then capital-labour ratios are likely to stagnate. Since it is through new capital that productivity generating processes are largely embodied (see Englander and Mittelstadt, 1986), the result will be a slowdown in productivity growth. In turn there are further pressures for wage restraint and cost reduction. This scenario reverses the earlier experience, with technical progress now being largely capital augmenting for relative cost reasons. This has important implications for the longer term Okun relationship in the Australian economy (see Hughes, 1990) and upon the future productivity growth rates and living standards. The current emphasis upon award restructuring is intended to give a fillip to productivity. Perversely it may reduce unit labour costs further and result in increased work intensification, but at best in a static sense all this improves is the utilization of labour (see Burgess and Macdonald, 1989). A one off improvement, but the aim is to achieve sustained growth in labour productivity. Microeconomic reforms and increasing labour flexibility should not be seen as the catalysts for unleashing a significant improvement in productivity growth rates.

As cautioned by Brown (1989), increasing flexibility may only increasingly segment the labour market and direct attention away from some of the fundamental forces influencing productivity growth rates. In reality productivity growth depends heavily on not only what goes on in the enterprise, but what goes on outside it. Following on from Verdoorn's Law, restrictive demand policies in lieu of current account deficits can only dampen productivity growth. In concert, high real interest rates supporting an overvalued exchange rate will do likewise; investment will be stifled and there will be an increase in labour-capital ratios. The interdependence between sectors and between the public and private sector should also be considered. Cost cutting and efficiency in resource utilization are commendable goals, but in themselves they cannot generate sustained productivity growth.

One of the real dangers of the current Accord process is that it confuses static efficiency with dynamic efficiency, also it creates unrealistic expectations and provides plenty of ammunition for the critics of the Accord. While the Accord delivers real wage restraint it also places downward pressure on productivity growth and gives credibility to the critics of the Accord process (see Moore, 1989). The evidence suggests that productivity growth is largely determined by factors external to the enterprise - true it is important how the enterprise manages these factors (see Frenkel, 1989) - to place emphasis upon the enterprise or to fix enterprise wage systems to productivity growth is opening up a large can of worms and missing the real focus of productivity generation.

## CONCLUSION

There is a productivity imperative in Australia which is being highlighted by the publicity surrounding award restructuring and the process of microeconomic reform. This paper has reviewed a range of evidence on Australian manufacturing productivity performance for the 1980's. Skinner (1986) argued that for US manufacturing the paradox was that the more effort which went into efficiency improvements, especially via labour cost cutting, the

more stagnant productivity growth rates appeared to be. The same paradox is present in the current policies for improving Australian manufacturing productivity. Output growth and investment in new plant and equipment are longer term determinants of productivity growth. Microeconomic reforms can improve static efficiency, but do not address longer term dynamic issues. Restrictive macroeconomic policies only serve to stifle investment and productivity growth. The Accord has reduced the relative cost of labour inputs and resulted in capital augmenting technical change. Within such an environment the longer term prospects for manufacturing productivity growth are bleak; poor productivity performance in the future will generate further pressure for accelerated microeconomic reforms, restrictive demand policies and downward pressure on real wages. The productivity paradox will continue!

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