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EARNINGS INEQUALITY IN AUSTRALIA:

CHANGES AND CAUSES

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Abstract

This paper reviews research which has examined recent developments in earnings inequality in Australia. Four main issues are addressed. First, what have been the dimension and timing of changes in earnings inequality which have occurred? Second, how have earnings differentials between workers in different age groups and with different levels of educational attainment changed, and to what extent can those changes be explained by shifts in the relative demand for labour and relative supply of labour by level of skill? Third, what do we know about the causes of changes in earnings inequality? Fourth, how have changes in earnings inequality affected the distribution of income?

1. Introduction

Writing about the Australian wage-setting system in the 1930s W.K. Hancock (1930, p.153) commented that "...the dominant passion of Australian labour is for substantial equality". Traditionally, this passion has been regarded as having its manifestation in a more egalitarian wage structure in Australia than in other countries (see for example the citations in Norris, 1986). However, in recent years a range of studies have suggested that - at least in terms of the distribution of earnings - Australia is moving progressively further away from the goal of substantial equality. Following studies undertaken in the United States and United Kingdom which showed large increases in earnings dispersion in those countries in the period since the mid-1970s (for example, Juhn et al., 1993, and Schmitt, 1993), researchers in Australia have undertaken similar analyses and found evidence that earnings dispersion has also increased in this country.

The objective of this paper is to review research on recent developments in earnings inequality in Australia.[1]   Individual studies of earnings inequality have tended to apply different data sources, have often used different methods for measuring earnings inequality, and have examined different potential causes of changes in earnings inequality. Hence, after several years of renewed research on the topic of earnings inequality it seems an appropriate time to assess where we currently stand in our understanding of changes in earnings inequality in Australia, and to consider what further research might be desirable.

It seems generally accepted that knowledge about the nature and causes of changes in earnings inequality is important for a number of reasons. First, analysis of earnings inequality is the starting point for developing an understanding of the distribution of income in a society. Hence, information on changes in earnings inequality may be useful for assessing changes in social welfare.[2] Second, to the extent that the main changes in labour market outcomes in Australia in recent years - for example, higher rates of unemployment and lower rates of real wage growth than in preceding periods, and changes in the distribution of earnings - have been caused by a common set of factors, understanding the causes of changes in earnings dispersion may provide a 'window' for obtaining insights into the causes of other important labour market developments.

The organising structure for the paper is to initially examine evidence on changes in earnings inequality and on changes in earnings differentials between groups of workers with different observable characteristics, and to then link that descriptive information in a review of the potential causes of changes in earnings inequality.

Section 2 presents descriptive evidence on the size and timing of changes in earnings inequality. Section 3 examines how earnings differentials between workers in different age groups and with different levels of educational attainment have changed, and whether shifts in the relative demand for labour and relative supply of labour skill level can explain changes in earnings differentials. Section 4 provides a general framework for assessing the causes of changes in earnings inequality. The decomposition framework identifies potential causes of changes in earnings inequality as changes in the composition of employment between workers with different characteristics, and changes in earnings differentials between groups of workers with different characteristics. Hence, the framework provides a basis for linking information on changes in earnings inequality and on changes in earnings differentials between workers across age and education groups presented in the previous sections. Research on a range of other topics is also reviewed in the paper. Section 5 examines evidence on the effects of changes in earnings inequality on the distribution of income in Australia. Section 6 provides a brief comparison of changes in earnings inequality in Australia and in a range of other developed countries. Concluding remarks with suggestions for future research are in section 7.

2. Changes in Earnings Inequality

This section reviews descriptive information on changes in earnings inequality in Australia in the period since the mid-1970s. The first sub-section presents measures of changes in earnings inequality using data from the ABS Labour Force Survey (LFS). The second sub-section examines whether alternative data sources - the ABS Survey of Employee Earnings and Hours (SEEH) and the ABS Income Distribution Survey (IDS) - provide consistent information on changes in earnings inequality.[3] The third sub-section compares and attempts to reconcile the findings from alternative measures of the extent of change in earnings inequality.

a. Descriptive Information

Descriptive information on changes in earnings inequality for the period between 1975 and 1995 using earnings data from the LFS is presented in this sub-section. The material presented is drawn primarily from Borland and Wilkins (1996). Figures 1a and 1b show annual observations of real weekly earnings in main job for full-time employees at different percentiles of the distribution of earnings (normalised to 100 in 1975). For both male and female employees the emerging dispersion between each earnings series - with individuals at the top of the distribution of earnings achieving higher real weekly earnings than individuals at the bottom of the distribution

- shows that earnings inequality has increased. For example, between 1975 and 1995 real weekly earnings of a male employee at the 10th percentile decreased by 9.4 per cent, whereas earnings of an employee at the 90th percentile increased by 10.0 per cent. And for female employees over the same period real weekly earnings of an employee at the 10th percentile increased by 13.1 per cent, whereas earnings of an employee at the 90th percentile increased by 25.8 per cent.

Figure 2 provides summary information on the change in log real weekly earnings in main job by decile in the distribution of earnings for full-time male and female employees between 1975 and 1995. A number of contrasts between changes in earnings inequality for male and female employees are evident from Figure 2. First, real weekly earnings of male employees below the 40th percentile decreased over the period, whereas real weekly earnings of females at all decile intervals increased in the same period. Second, the increase in earnings dispersion for male employees has occurred throughout the distribution of earnings, whereas for female employees the increase in earnings dispersion appears concentrated above the median point of the distribution of earnings. Third, measured by either the change in the difference between log real weekly earnings of individuals at the 90th and 10th percentiles, or at the 75th and 25th percentiles, earnings dispersion has increased by a larger amount for male employees than for female employees.

What has been the timing of changes in earnings dispersion? Figures 3a and 3b decompose changes in earnings inequality for male and female employees into a number of sub-periods: 1975-1982, 1982-1990, and 1990-1994. Real weekly earnings of employees at the 10th, 25th, 50th, 75th, and 90th percentiles are adjusted to equal 100 in each base period (1975, 1982, and 1990), and the adjusted measures of real weekly earnings at the 10th, 25th, 75th, and 90th percentiles are then expressed as a ratio of adjusted real weekly earnings of the median employee. Figure 3a shows that the main influences on changes in earnings inequality for male employees have been: a decrease in relative earnings of employees with below-median earnings between 1975 and 1982; and an increase in relative earnings of employees with above-median earnings between 1990 and 1994. Figure 3b shows a slightly different pattern for female employees. A decrease in relative earnings of employees with below-median earnings between 1975 and 1982, and an increase in relative earnings of employees with above-median earnings between 1975 and 1990, were factors causing an increase in earnings inequality. However, those influences were to some extent offset by an increase in the relative earnings of employees at the bottom of the distribution of earnings (10th percentile) between 1982 and 1990.

The descriptive information on the distribution of earnings presented in this sub-section is constructed from a sample of full-time employees in each year. Hence, it

is important to be aware that as the population of full-time employees changes over time, the distribution of earnings may also be affected. For example, suppose that there is an increase in the number of unemployed persons and that the new entrants to unemployment are drawn exclusively from the bottom decile of the distribution of earnings. Then with real weekly earnings of all other employees unchanged over time, measures of earnings dispersion would show a decrease in inequality that was due to sample selection effects.

Another factor that must be taken into account is that measures of changes in earnings inequality will be sensitive to the starting date chosen for the analysis. The implications of a finding that earnings inequality has increased substantially over some time period may differ significantly depending on the absolute level of earnings inequality in the starting year. In this study 1975 has been chosen as the starting date as it is the earliest year from which continuous annual data on the distribution of earnings are available. Research undertaken by Norris (1977) suggests that the finding of increased earnings inequality between 1975 and 1995 is not likely to be dependent on the choice of starting year. Norris examined changes in dispersion of weekly earnings of full-time adult male employees between 1960 and 1975, and concluded that there was little overall change in earnings inequality during this period.

b. Alternative Data Sources

A range of studies have used alternative data sources to the LFS to examine changes in earnings inequality. King et al. (1992), Gregory (1993), and McGuire (1994) have applied data from the SEEH; and Borland and Wilkins (1996) use data from the IDS. These studies which apply alternative data sources arrive at the same general conclusion that the extent of earnings dispersion in Australia has increased since the mid-1970s. However, whether the data sources match in estimates of the size and timing of changes in earnings dispersion has not been assessed.

To examine the relation between earnings data from the LFS and the SEEH Table 1 presents a decomposition of changes in average 90-10 and 75-25 percentile differences in log real weekly earnings for sub-periods between 1975-77 and 1993-95 for each data source. In making the comparison it is important to note that there are two differences between the earnings series: first, the LFS data are for all employees whereas the SEEH data are for non-managerial employees; and second, the LFS data are for weekly earnings in main job whereas the SEEH data are for total weekly earnings.

For the period 1975-77 to 1993-95 the alternative data sources provide similar findings on changes in earnings inequality. Both data sources show increasing earnings dispersion at all points of the distribution of earnings for male employees, and for

female employees a narrowing of dispersion between the 10th and 50th percentiles and increasing earnings dispersion at other points of the distribution of earnings. The main differences are that for male employees the LFS shows a larger increase in earnings dispersion between employees at the 10th and 50th, and 50th and 90th, percentiles than the SEEH; and for female employees the LFS shows a larger increase in earnings dispersion between employees at the 50th and 90th percentiles than the SEEH. Hence, it appears that the data sources display greater consistency in measures of changes in earnings inequality around the mid-points of the distribution of earnings than at the end-points of the distribution.

For the disaggregated time periods there is again a reasonable degree of consistency between the data sources although further differences are apparent. For both male and female employees the SEEH shows a more even increase in earnings dispersion between 1975-77 and 1989-91, whereas the LFS shows increases in earnings inequality in this sub-period concentrated between 1975-77 and 1979-81. For male employees the LFS shows larger increases in earnings dispersion at the top of the distribution of earnings between 1989-91 and 1993-95 than the SEEH (adding in managerial employees accounts for some - but not all - of the difference). And for female employees the SEEH shows declining earnings dispersion between employees at the 10th and 50th percentiles over all sub-periods, whereas the LFS shows decreases in earnings inequality only after 1983-85.

To compare earnings data from the LFS and IDS, Borland and Wilkins (1996) examined the correlation between measures of changes in real weekly earnings by decile between 1982 and 1990 from the two data sources. For both male and female employees the measures from the alternative data sources generally display a high degree of consistency. The main differences found to exist between the data sources were in the measures of changes in real weekly earnings at the 10th and 90th percentiles.

c. Alternative Measures of Earnings Dispersion

The approach to measurement of changes in earnings inequality applied in the previous sub-sections involves analysis of whether changes in real weekly earnings over some time period differ for employees at different positions in the distribution of earnings. Two alternative approaches to measurement of changes in earnings inequality have also been applied. One approach is to define 'low-wage', 'medium-wage' and 'high-wage' jobs and to examine changes over time in the proportion of employees with each type of job (for example, King et al., 1992, and McGuire, 1994). Job categories are defined on the basis of earnings relative to median earnings. For example, 'low-wage' jobs might be defined as jobs with weekly earnings less than 75%

of median weekly earnings. Changes in the proportion of employees in each job type category can have implications for earnings dispersion. For example, an increase in the proportion of employees in 'low-wage' and 'high-wage' job categories is generally interpreted as an increase in earnings inequality. A second approach is to apply the ratio of quintile earnings boundaries to median earnings in a base period to an end-period, and to examine the change over time in the number of employees in each earnings interval (Gregory, 1993). With this approach an increase in the proportion of employees in the bottom and top base-period quintile ranges is interpreted as an increase in earnings inequality.

Table 2 presents some results from studies which have applied these alternative measurement approaches. Panel A shows that the proportion of male and female employees in low-wage (below 75% of median weekly earnings) and high-wage (above 150% of median weekly earnings) jobs decreased between 1975 and 1989. Panel B shows that employment growth for male and female employees between 1976 and 1990 was concentrated in ranges of the distribution of earnings which were in the bottom and top quintiles of the distribution of earnings in 1976. Hence, both methods of measurement find a 'disappearing middle' in the distribution of earnings and produce results consistent with increased earnings inequality.

Recently, some criticism of these alternative methods of measurement and of the findings of a 'disappearing middle' have been raised (see Belchamber, 1995). The main criticism of the measures is as follows. Each measure defines 'low-wage' and 'high-wage' jobs on the basis of earnings relative to median earnings. Therefore, there are two ways in which, for example, an increase in the proportion of 'low-wage' jobs could occur. First, median earnings might be unchanged but earnings in some below median earnings jobs could decrease pushing those jobs below the 'low-wage' threshhold. Second, median earnings might increase which will raise the cutoff level of absolute earnings between 'low-wage' and 'medium-wage' jobs. With an unchanged distribution of earnings below the initial level of median earnings, the higher cutoff level of earnings can increase the proportion of 'low-wage' jobs.

The second scenario of a higher level of median earnings with an unchanged distribution of earnings below the initial median level of earnings could occur if extra jobs are created with earnings above the initial median level of earnings. Belchamber (1995) provides evidence which supports the argument that increases in the proportion of 'low-wage' jobs in Australia between 1985 and 1991 were primarily due to creation of new jobs at the top end of the distribution of earnings. However, whether this constitutes a criticism of the measurement methodologies would seem to depend on the appropriate definition of a 'low-wage' job. If a job is regarded as 'low-wage' only in the context of earnings in that job relative to earnings in other jobs, the alternative

methodologies seem appropriate for measuring the proportion of 'low-wage' jobs; on the other hand, where it is the absolute level of earnings which determines whether a job should be defined as 'low-wage' the alternative methodolgies may provide a misleading guide to the proportion of 'low-wage' jobs (Levy and Murnane, 1992, pp.1338-1340).

3. Changes in the Structure of Earnings

What have been the causes of changes in earnings inequality in Australia? To think about this question the common approach is to consider what types of factors affect individuals' earnings at a point in time, and to examine how those factors might have changed over time. Generally the factors which are considered to affect earnings at a point in time are thought of as either 'characteristics' of workers, or 'returns to characteristics' of workers. Characteristics which are relevant for earnings determination may be either observable or unobservable to researchers. An example of an observable characteristic would be an individual's level of educational attainment; and an example of a characteristic which is often unobservable would be an individual's IQ. The return to a characteristic measures the effect on earnings of a marginal change in that characteristic. For example, the return to educational attainment is the extra earnings which accrue to an individual who acquires an extra year of schooling. This taxonomy of the factors which can affect individual earnings at a point in time provides the basis for a classification of factors which might cause changes in earnings dispersion over time: Changes in the distribution of observable characteristics amongst the workforce; Changes in the returns to observable characteristics; and Changes in the distribution of unobservable characteristics amongst the workforce or changes in the return to unobservable characteristics. This section examines the second factor - Changes in the return to observable characteristics. In the next section an overall assessment of the contribution of each factor to changes in earnings inequality in Australia is undertaken.

Following the theory of equalizing differences (see Rosen, 1986) characteristics which are generally considered relevant for earnings determination relate to the skill levels of workers, and job conditions. Research on earnings inequality has largely focused on how earnings differentials between workers with different skill levels have changed over time. Of course skill is a difficult concept to define involving physical abilities, cognitive abilities, and interpersonal capabilities of workers (see for example, Spenner, 1990). Proxies for the skill level of a worker which are commonly adopted are age or labour market experience, educational attainment, and occupational status. Research in Australia has examined how earnings differentials have changed between

workers in different age groups, and with different levels of educational attainment. The next sub-section presents descriptive information on changes in earnings differentials between employees in different age groups, and with different levels of educational attainment. The following sub-section examines how changes in the relative demand for and relative supply of labour with different skill levels have affected earnings differentials. The final sub-section discusses other evidence on changes in the relative demand for labour by skill level, and introduces possible explanations for demand shifts.

a. Descriptive Information

Table 3 presents information on relative average weekly earnings in main job of full-time employees disaggregated by age group between 1975 and 1994. Following McGuire (1994) and Borland and Wilkins (1995) the main finding from Table 3 is that for both male and female employees there have been large and consistent decreases in relative earnings of younger and older employees.[4] For example, the ratio of weekly earnings of employees aged 15-19 years and employees aged 35-44 years fell from 50.0 per cent in 1975 to 41.1 per cent in 1994.

Table 4 presents information on changes in relative average annual and weekly earnings of workers with different levels of educational attainment between 1968/89 and 1989/90. The findings are consistent with evidence from a number of studies which have examined changes in earnings differentials across education groups (Miller, 1983, Maglen, 1991, 1993, Chia, 1991, Karmel, 1993, 1995, Borland, 1995, and Gregory, 1995). Using workers who did not complete high school as the base group, relative earnings of male and female employees with a degree decreased between 1968/69 and 1985/86, with a slight reversal between 1985/86 and 1989/90. Relative earnings of employees with a trade qualification or diploma decreased between 1968/69 and 1981/82, with a slight reversal between 1981/82 and 1989/90. Relative earnings of male employees who had completed high school decreased between 1968/69 and 1981/82, with a reversal between 1981/82 and 1989/90; and relative earnings of female employees who had completed high school showed little change over the period.

In interpreting data on relative earnings between workers with different skill levels it is important to consider whether changes in earnings differentials represent effects of changes in the relative market price for the different skills of those workers, or changes in the relative quality of workers in different skill categories. For example, changes in the relative quality of workers with different levels of educational attainment might occur due to changes in the age composition of workers in each education group, or to changes in the relative quality of educational outcomes across

cohorts of workers. Alternatively, changes in the relative quality of labour by age group might occur due to changes in the average educational attainment of workers in each age group, or to changes in the average years of labour market experience between age groups.

In some cases it is possible to control for effects of changes in relative quality of labour between skill groups in order to focus on effects of changes in the relative market return on earnings differentials. For example, within-cohort comparisons of earnings of workers in different education groups hold constant the age composition of the population, and provided the same group of workers from the cohort is employed in each time period, the quality of labour within each education group in the cohort will also be constant. Hence, time-series analysis of relative earnings by level of educational attainment within a cohort of workers can be considered to provide information on changes in the market return to constant quality units of labour in each education group.

Following the approaches in Chia (1991) and Borland (1995) Table 5 shows the ratio of average annual earnings for synthetic cohorts of workers with a degree and who had not completed high school between 1968/69 and 1989/90. Numbers in the same line in the Table shows within-cohort relative annual earnings of workers in those education groups. Importantly, within-cohort changes in relative earnings follow the same U-shaped pattern over time as is evident in the aggregate data for male and female workers in Table 4. Perhaps the main difference between the within-cohort changes in relative earnings and the aggregate data is that for some older groups of males increases in relative earnings of workers with a degree are shown to have increased from 1978/79 onwards rather than from 1985/86. As well as evidence of within-cohort changes in relative earnings by level of educational attainment, there also appear to have been changes over time in the relative quality of labour between education groups. For example, the 'Degree/NCHS' earnings ratio for workers aged 15-24 declined between 1973/74 and 1985/86 which suggests that the relative quality of workers with a university degree decreased with each new cohorts of labour market entrants over that period.

b. Labour Supply and Labour Demand

Could changes in labour supply have affected earnings differentials between workers in different age groups and with different levels of educational attainment? Potentially, this appears a strong possibility as there have been large changes in relative labour supply by age and educational attainment since the late 1960s. The labour supply of both younger and older males and females has declined, whilst labour supply of prime-age males and females has increased (Borland and Wilkins, 1995). At the

same time, there has been a large decrease in labour supply of males and females who have not completed high school, and increases in labour supply of males and females with higher levels of educational attainment (Karmel, 1995).

Substantial changes in the composition of employment have also occurred since the early 1970s which suggests the possibility that changes in relative earnings between workers in different age groups, or with different levels of educational attainment, have been caused by changes in relative demand for different types of labour. Similar to the changes shown to have occurred in the relative labour supply of different groups, the share of employment of younger and older workers has decreased whilst the share of prime-age workers has increased (Borland and Wilkins, 1995), and there has been a decrease in the employment share of workers who have not completed high school and an increase in the share of workers with higher levels of educational attainment (Maglen, 1991).

To assess whether the changes in relative labour supply and labour demand by age and educational attainment could have affected earnings differentials, Borland and Wilkins (1995), Borland (1995), and Karmel (1995) have applied tests from Katz and Murphy (1992). The labour supply test examines whether data on relative earnings of workers in different age or education groups are consistent with the hypothesis of stable factor demand by evaluating the sign of:

$$\Delta_{tt} = (w_t - w_t) \cdot (L_t - L_t) \qquad (1)$$

where w_t is a $k \times 1$ vector of market prices for labour inputs in period t and L_t is a $k \times 1$ vector of labour inputs in period t. Katz and Murphy demonstrate that where the aggregate production function from which the demand for labour inputs is derived is concave and linear homogeneous: a) $\Delta_{tt} \leq 0$ implies that changes in relative earnings and employment can be explained solely by changes in relative labour supply, although it is also possible that changes in relative labour demand have occurred; and b) $\Delta_{tt} > 0$ implies that a necessary condition to explain changes in relative earnings is changes in relative labour demand, although this finding does not exclude the possibility that changes in relative labour supply have also occurred.

To test for the effects of demand factors on relative earnings between age and education groups, Murphy and Katz (1992, p.68) note that with CES technology the relative wage rates of two groups of workers at time t can be expressed as:

$$\log(w_1(t)/w_2(t)) = (1/S)[D(t) - \log(x_1(t)/x_2(t))] \qquad (2)$$

where $w_i(t)$ is the wage rate of group i, s is the elasticity of substitution between the two types of labour, D(t) is a time-series of relative demand shifts measured in log quantity units, and $x_i(t)$ is labour inputs from group i. It is straightforward to solve equation (2) for the relative demand shift variable in each time period:

$$D(t) \ = \ s[\log(w_1(t)/w_2(t))] \ + \ \log(x_1(t)/x_2(t)) \qquad (3)$$

Where the labour market operates on the specified demand curve, equation (3) can be applied to derive estimates of the demand shift variable. As has been noted previously, it is important to be aware that changes in relative labour demand can occur either due to changes in the relative market return to constant quality units of labour in each skill group, or to changes in the relative quality of labour between skill groups.[5]

Borland and Wilkins (1995) examine data from both the LFS and IDS data sources and do not find strong evidence that labour supply effects alone are able to explain changes in earnings differentials between age groups. There is consistent evidence of labour supply effects on relative earnings between 1975 and 1979, weak evidence of labour supply effects on relative earnings between 1975 and 1990, and no evidence of labour supply effects in the period after 1990. On the other hand, analysis of earnings differentials between workers with different levels of educational attainment provides stronger evidence of labour supply effects. Borland (1995) finds that changes in relative earnings by education group are consistent with labour supply effects as the only determinant of changes in earnings of male employees between 1968/69 and 1985/86, and changes in earnings of female employees between 1974/75 and 1989/90.

Borland and Wilkins (1995) examine labour demand effects on earnings differentials between age groups. Using workers aged 35-44 years as the base group, they find a consistent decrease in the relative demand for workers aged 15-24 years, 25-34 years, and 55-64 years between 1975 and 1994. Relative demand for workers aged 45-54 years initially decreased over the period, but then increased at the end of the period. Karmel (1995) and Borland (1995) examine how labour demand changes have affected the relative demand for workers with different levels of educational attainment. Both studies find evidence of a strong and consistent increase between 1968/69 and 1989/90 in demand for workers with a degree, trade qualification or diploma, or who had completed high school relative to workers who had not completed high school.

c. Assessment

Analysis of changes in earnings differentials between workers in different age groups and with different levels of educational attainment in Australia suggests the following scenarios regarding effects of changes in labour supply and labour demand. From the mid-1970s onwards there has been a consistent increase in the relative demand for male and female workers in prime-age groups and with higher levels of educational attainment. The rate of increase in relative demand for those groups may have gradually accelerated over the period. Changes in the supply of workers with different levels of educational attainment more than offset the effects on earnings differentials of changes in relative demand during the 1970s and in the first part of the 1980s; however, in the latter part of the 1980s demand changes appear to have been the main factor affecting earnings differentials. The switch from supply to demand factors as the primary explanatory factor for changes in earnings differentials between education groups appears to have been due mainly to an accelerating rate of change in relative demand, rather than a decreasing rate of change in relative supply of workers with different levels of educational attainment. Changes in the supply of workers in different age groups offset demand changes in the latter part of the 1970s, but since that time the main determinant of changes in earnings differentials appears to have been changes in relative demand.

The increase in relative demand for workers in prime-age groups, and with higher levels of educational attainment, can be interpreted as an increase in the relative demand for high-skill workers and a decrease in relative demand for low-skill workers. Other evidence of an increase in the relative demand for more skilled workers in Australia is also available. Gregory (1993) and Aungles et al. (1993) have shown that an increase in relative demand for workers in 'high-skill' occupation groups occurred between 1976 and 1991. And Borland and Foo (1996) present evidence of an increase in relative demand for nonproduction employees in manufacturing industry between 1952 and 1987.

What factors could have caused an increase in the relative demand for workers with higher skill levels? First, changes in the industrial composition of product demand which occur, for example, due to changes in the pattern of international trade, will shift the relative demand for labour towards those types of labour which are intensive in expanding industries. Where expanding sectors are intensive in more highly skilled labour this can explain an increase in the demand for workers with higher levels of skill. Second, increases in the capital intensity of production where high-skill labour is a complement for capital and low-skill labour is a substitute for capital can cause an increase in the relative demand for more skilled labour (Griliches, 1969). A third explanation for changes in the relative demand for labour by skill level is technological change. Hicks-neutral technical change does not affect the relative demand for

different types of labour within each industry sector, but may affect the composition of employment if the labour-saving effect of technical change varies between sectors which differ in skilled labour intensity. Alternatively, non-neutral technical change which occurs, for example, due to the introduction of computers, may increase the relative productivity of and demand for high-skill workers within each sector (Krueger, 1993).

4. Causes of Changes in Earnings Inequality

In this section possible causes of changes in earnings inequality are examined using the general framework for decomposing sources of changes in earnings inequality described in the previous section. The first sub-section describes one possible approach for decomposing the sources of changes in earnings inequality. The second sub-section describes results from the application of this decomposition methodology to Australia for the period between 1982 and 1990. The third sub-section assesses the findings from the decomposition analysis.

a. Deccomposition Approaches

A variety of methods can be applied to decompose changes in earnings inequality between the effects of changes in the distribution of, and return to, observable and unobservable characteristics of workers (see Borland and Wilkins, 1996). One method - variance decomposition - involves decomposition of the change in the variance of earnings over time between the effects of observable changes in characteristics, changes in earnings differentials between workers with different observable characteristics, and changes in the distribution of, and return to, unobservable characteristics. That is, where s_t^2 is the variance of log real weekly earnings in year t, s_{it}, s_{it}^2, and w_{it} are respectively the share of employees, the variance of log weekly earnings and average log real earnings in group i in year t, and $\overline{w}_t$ is average log real weekly earnings in year t:

$$s_t^2 \;=\; \sum_{i=1}^{n} s_{it} \cdot s_{it}^2 \;+\; \sum_{i=1}^{n} s_{it} \cdot [w_{it} - \overline{w}_t]^2 \tag{4}$$

By examining the effect of shifts in s_{it} across time it is possible to establish the effect of changes in the composition of employment on the variance of log weekly earnings; and similarly, by allowing s_{it}^2 and $[w_{it} - \overline{w}_t]^2$ to vary, the role of changes in within-group and between-group variance in earnings in explaining changes in the variance of log weekly earnings can be ascertained. Changes in the composition of employment show the effect of changes in the distribution of observable characteristics on earnings

dispersion, changes in between-group earnings variance show the effect of changes in the returns to observable characteristics, and changes in within-group variance in earnings show the effect of changes in the distribution of, and returns to, unobervable characteristics.

b. Findings

Borland and Wilkins (1996) have applied the variance decomposition method described in the previous sub-section to examine the causes of changes in inequality in weekly earnings in Australia between 1982 and 1990. In that study the workforce is disaggregated into 20 skill groups (five education groups and 4 experience groups) for males and females. The results of the decomposition analysis are shown in Table 6 and can be summarised for both male and female employees as follows: First, changes in the distribution of observable characteristics caused a slight increase in earnings dispersion. Second, changes in the return to observable characteristics caused a decrease in earnings dispersion. Third, changes in the distribution of, and return to, unobservable characteristics caused an increase in earnings dispersion, and were the main factor affecting earnings dispersion over the period. The effects of unobservable factors appear to have had the largest impact on earnings dispersion for workers in the top quintile of the distribution of earnings. In interpreting these findings it is, of course, important to note that the results are for the period between 1982 and 1990, and it is not possible to say whether the same conclusion would extend to other time periods.

c. Assessment

Analysis of changes in earnings inequality in Australia between 1982 and 1990 shows that an important factor which tended to increase earnings inequality over that period was changes in the distribution of, and return to, unobservable characteristics. As differences in educational attainment and years of experience of workers are the 'observable characteristics' in the decomposition analysis, therefore changes in the distribution of, and return to, unobservable characteristics can be interpreted as changes which occur within education and experience categories.

What factors might cause changes in the distribution of, or return to, characteristics within education and experience categories? A number of possible explanations have been suggested. First, it is possible that changes in the distribution of unobservable skill characteristics (for example, in the distribution of quality of schooling qualifications within each education category) will affect earnings inequality. Second, changes in the return to unobservable skill characteristics (for example, an increase in the returns to cognitive skills from introduction of computers to the

workplace) will change the distribution of earnings within education and experience categories. Third, it is known that even after controlling for differences in skill levels and job conditions, earnings of workers vary significantly with industry classification (Borland and Suen, 1990). Changes in inter-industry earnings differentials will therefore affect earnings inequality within education and experience categories. Fourth, changes in intra-firm or intra-establishment earnings differentials between workers with similar education attainment and years of experience will contribute to effects of unobserved characteristics on earnings inequality. Finally, changes in institutional factors (for example, wage-setting rules or trade union power) may affect earnings dispersion within education and experience categories.

In Australia, there is little research which assists in distinguishing between these explanations for how unobservable factors might have caused changes in earnings dispersion. Preston (1995) has shown that inter-industry earnings differentials increased between 1981 and 1991 in Australia. This is suggestive of some effect of inter-industry effects on changes in earnings dispersion; however, further work would be required for the magnitude of the effect to be determined. Borland (1996) has examined the relation between changes in union density and changes in earnings dispersion in Australia between 1986 and 1994. As earnings dispersion for union members is less than for nonunion members, it might be expected that decreases in union density which have occurred in Australia from the early 1980s (for example, union density for male employees fell from 53 per cent to 38 per cent between 1982 and 1994) would have been associated with an increase in earnings dispersion. Table 7 presents some findings from shift-share analysis of the relation between changes in union density and changes in earnings inequality. It is shown that changes in union density can account for approximately 30 per cent of the increase in the variance of earnings of full-time male employees in Australia between 1986 and 1994, and 15 per cent of the increase in the variance of earnings of full-time female employees over the same period. Increases in the variance of earnings of nonunion members have been the main determinant of increases in earnings dispersion. In interpreting these findings two limitations of the study of union density effects must however be noted: first, the study does not control for changes over time in the distribution of, and return to, observable skill characteristics; and second, although the findings provide evidence of empirical linkages between changes in union density and changes in overall earnings dispersion, this is not a sufficient basis for establishing causality from changes in union density to changes in earnings dispersion.

5. Earnings and Income Inequality

How have changes in earnings dispersion affected income inequality in Australia? Labour market earnings account for a significant proportion of income received by most persons and income units (Saunders, 1995, p.3 shows that 62 per cent of total household income in Australia in 1989-90 was received in the form of wages, salaries, and supplements) and hence it might be expected that there would be a significant flow-on effect from changes in earnings dispersion to income inequality. Consistent with this hypothesis, a range of studies have shown that income inequality has increased between families and between households during the 1980s (Harding, 1993, 1996, and Johnson et al., 1995). For example, findings from Harding (1996) reported in Table 8 shows that between 1981-82 and 1989-90 the Gini coefficient for the distribution of family market income (between individuals) increased by 3.2 per cent. Despite the consistency between the directions of changes in inequality in labour market earnings and market income, it is important to note that many other factors apart from changes in earnings inequality can affect the distribution of income. Hence, to determine the effect of changes in earnings dispersion it is important to examine the role of other factors which could also have affected the distribution of market income.

In assessing the effects of changes in earnings inequality on the distribution of income one problem is that recent studies of income inequality in Australia have differed in their choices of definitions of income units - household, families, or ABS income unit - and in choices of how to report the distribution of income - over individuals or over income units. Hence, it is sometimes difficult to compare findings from different studies. Nevertheless, it does seem that a reasonably consistent story on causes of changes in market income inequality in Australia emerges from recent research.

The starting point for analysing the effects of changes in earnings inequality on the distribution of market income is to set out the range of factors which might affect the distribution of market income. First, changes in the distribution of market income between income units can occur due to changes in the distribution of business income, investment income, and wage and salary income. Second, sources of changes in the distribution of wage and salary income between income units can be decomposed as: changes in the distribution of wage and salary payments between individuals; changes in the distribution of employment between income units; and changes in the composition of income units. For example, increases in earnings dispersion between individuals who are heads of income units is likely to increase income inequality; similarly, a change in the distribution of employment which increases the proportion of two-worker and zero-worker income units and decreases the proportion of one-worker income units is likely to increase income inequality.

On the first issue of the role of different types of market income in changes in income inequality Table 8 shows that increases in inequality in both the distribution of business income and of wage and salary income have occurred during the 1980s. Unfortunately, existing studies do not present evidence which would allow the relative effect on market income inequality of changes in the distribution of business income and in the distribution of wage and non-wage income to be determined.

The second issue of causes of changes in the distribution of wages and salaries between income units can be addressed using the decomposition stated above. First, inequality in the distribution of wage and salary income between individuals increased during the 1980s (Harding, 1993, and Saunders, 1995). While effects of increases in earnings dispersion amongst full-time employees were largely offset by decreases in earnings dispersion between part-time employees, an increase in the earnings differential between full-time and part-time employees and the growing proportion of part-time employees caused the distribution of wage and salary income between individuals to widen. Second, changes in the distribution of employment between income units appear to have increased inequality in the distribution of wage and salary income. This finding seems to be primarily explained by increases in unemployment which have been relatively concentrated amongst income units in the lower range of the distribution of income (Bradbury, 1992, and Saunders, 1992). On the other hand, the sizeable changes male and female labour force particpation rates and employment/population rates which occurred during the 1980s (Gregory, 1991) appear to have had little effect on the distribution of wage and salary income (Harding, 1994). For example, changes in employment patterns of females in married couples have a net equalising effect on the distribution of wage and salary income (Bradbury, 1992, and Saunders, 1993). Changes in employment/population rates of females in married couples have been positively correlated with husband's position in the male distribution of earnings. This might have been expected to increase income inequality. However, the increase in inequality caused by the growing gap between high income and low income couples, has been more than offset by a falling gap between high income and middle income couples. The latter effect is explained by the greater proportionate effect on married couples' incomes of changes in female employment/population rates for middle income couples than for high income couples. Third, changes in the composition of income units appear to have increased income inequality. For example, Harding (1994, p.25) argues that the rise in the proportion of persons living in sole parent and 'couple without children' families - and the corresponding decline in the proportion living in 'couple with children' families - have exacerbated wage and salary income inequality during the 1980s.

From existing studies it seems reasonable to conclude that increases in earnings dispersion were one factor which explains increases in market income inequality in Australia during the 1980s. However, as these studies have generally been concerned with issues apart from effects of earnings inequality on income inequality, the available evidence on the issue must be regarded as somewhat sketchy. Hence, it appears that there is still scope for futher research to determine the significance of the relation between changes in earnings dispersion and income inequality. In particular, research which examines this relation using alternative definitions of an income unit and methods of reporting the distribution of income, and which conisders issues such as the relative effects on income inequality of changes in earnings dispersion and other factors, would be most valuable.

6. International Comparisons

How do the changes in earnings inequality in Australia since the mid-1970's compare with the experience of other countries? This section briefly reviews the findings of overseas studies on the nature and sources of changes in the distribution of earnings. Table 9 summarises findings on changes in earnings inequality for male employees. It does not seem too inaccurate to classify countries into three groups on the basis of changes in earnings inequality since the mid-1970's. In both the United States and the United Kingdom there have been very large increases in earnings dispersion since 1975. The experience of Australia appears to match with a group of countries (including Canada and perhaps New Zealand) where increases in earnings dispersion have been significant, but not as substantial as in the United States or United Kingdom. Gregory and Woodbridge (1993) have examined changes in earnings dispersion in the United States and Australia between 1976 and 1992, and find that the main difference between the experience of those countries over that period was a larger increase in earnings dispersion for employees with above-median earnings in the United States than in Australia. In a third group of countries - such as France and Germany - earnings inequality has increased only marginally, or has decreased since the mid-1970's.

In the countries which have experienced the greatest increases in earnings dispersion, the United States and United Kingdom, changes in earnings inequality appear to have been due to changes in the return to observable skills and to changes in unobservable factors (Schmitt, 1993, Davis 1992, OECD, 1993, and Juhn et al., 1993). In Canada, Australia, and New Zealand, which have experienced less substantial increases in earnings dispersion, it has been changes in earnings dispersion within skill groups that have been the primary cause of changes in dispersion; and, in contrast to

the United States and United Kingdom there does not appear to have been a strong effect of changes in the rate of return to observable skills on earnings dispersion (Davis, 1992). In Germany there has been no change in earnings differentials across or within skill groups, and in France there has been a narrowing of earnings differentials across skill groups (Abraham and Houseman, 1993, and Katz et al., 1993).

7. Conclusion

Recent research on earnings inequality in Australia has documented in a reasonably conclusive manner increases in dispersion in weekly earnings for male and female employees in the period since the mid-1970s. There is also evidence of narrowing and then widening earnings differentials between employees with different levels of educational attainment, and widening earnings differentials between employees in different age groups. However, at least in the 1980s it appears that the higher degree of earnings inequality has not been the result of changes in earnings differentials between employees with different skill levels, but rather, it has been increases in earnings differentials between employees with similar observable skill characteristics which have been the main factor tending to cause an increase in earnings inequality.

Despite the contribution to our understanding of earnings inequality of recent research, there is still a large amount that we do not know. Three issues in particular seem to require attention. First, what have been the main factors which have caused increases in the relative demand for workers with higher levels of skill? Second, what factors have caused increases in earnings inequality between workers with similar observable skill characteristics? And third, how significant has been the effect of changes in earnings inequality on increases in market income inequality which have occurred in Australia? The answers to these questions should yield insights, not only into the causes of changes in earnings inequality, but also into other labour market developments of importance since the mid-1970s in Australia such as increases in the rate of unemployment and stagnant real wages.

Endnotes

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1. See also Borland and Norris (1996). For cross-country reviews of trends in earnings inequality see Davis (1992), OECD (1993), and Katz et al. (1993).

2. Interpreting the welfare consequences of changes in the distribution of earnings may not, however, be a straightforward exercise. For example, suppose that the proportion of persons with earnings in the bottom quintile of the distribution of earnings rises. Where the rise is known to be due to an increase in the number of low-wage full-time jobs and it is also known that the jobs are occupied by primary bread-winners, the interpretation might be welfare is lower after the change. On the other hand, where the rise in the proportion of low-wage jobs is due to the entry into the labour market of students taking part-time jobs in order to better prepare themselves for full-time employment, it would be possible to argue that an increase in welfare has occurred.

3. For a review of data sources see the Appendix.

4. From the alternative IDS data source however, a slightly different story emerges. Borland and Wilkins (1995) show that although over the whole of the sample period relative average annual earnings of full-time full-year workers in different age groups have moved in a similar direction to relative weekly earnings from the LFS, there are large differences in the timing, size of change, and ordering of size of change by age group between the data sources. For example, the IDS data source shows smaller changes in relative earnings by age than the LFS data source. One possible explanation for the difference between data sources is that the IDS excludes workers who were not in employment for a whole year, and hence, if it is workers with marginal attachment to employment who experience the largest changes in relative earnings, the IDS data source will underestimate changes in relative earnings for all workers who are employed at any point in time.

5. The Katz-Murphy tests assume that wages adjust to restore equilibrium in the labour market in response to changes in labour supply and labour demand. Given institutional factors such as the role of trade unions and the award wage system which are likely to affect wage outcomes in Australia, and the existence of high levels of unemployment, the assumption of wage adjustment and labour market equilibrium seems problematic. However, in an environment with labour market disequilibrium the Katz-Murphy tests have the same interpretations for the role of demand and supply factors provided that wages and employment adjust towards equilibrium in response to changes in labour demand and labour supply (Borland and Wilkins, 1995).

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Table 1: Change in Inequality (Percentile Difference) in Log Real Weekly Earnings - 1975-77 to 1993-95

	1975-77 to 1979-81	1983-85 to 1989-91	1989-91 to 1993-95	1975-77 to 1993-95
A. Males				
a. LFS				
90-50	3.79	1.42	4.66	9.87
50-10	7.91	2.27	-0.50	9.68
75-50	2.44	1.11	2.38	5.93
50-25	1.74	3.70	-0.71	4.73
B. SEEH				
90-50	1.90	2.86	0.62 (1.81)	5.38
50-10	3.34	1.38	0.60 (1.46)	5.32
75-50	2.27	1.67	0.54 (0.28)	4.48
50-25	1.87	0.33	0.90 (1.11)	3.10
B. Females				
a. LFS				
90-50	4.33	-0.31	-1.52	2.50
50-10	1.01	-3.72	-2.75	-5.46
75-50	2.50	3.30	-0.44	5.36
50-25	2.58	-0.84	0.76	2.50
B. SEEH				
90-50	5.44	1.77	0.91 (1.05)	8.12
50-10	-1.05	-3.68	-2.81 (-1.85)	-7.54
75-50	2.29	2.64	1.45 (1.90)	6.38
50-25	0.51	2.89	-0.30 (0.48)	3.10

Note: a) Data from the SEEH are not available for 1982; and differences in sampling methodolgy prevent comparisons of data from before 1981 and after 1983.

b) LFS data are weekly earnings of full-time employees in main job; and SEEH data are total weekly earnings of full-time non-managerial employees.

c) '90-50' denotes the difference in log weekly earnings of employees at the 90th and 50th percentiles of the distribution of earnings. Other measures of inequality are similarly defined.

d) Numbers in brackets for SEEH 1989-91 to 1993-95 are changes in the percentile differences in real weekly earnings for all employees.

Source: a. LFS - ABS, Weekly Earnings of Employees (Distribution) Australia, catalogue no.6310.0; and b. SEEH - ABS, Distribution and Composition of Employee Earnings and Hours - Australia, catalogue no.6306.0.

Table 2: Changes in the Distribution of Employment by Earnings

Panel A: Shares of Low-, Medium-, and High-Wage Employment - All Males and All Females - 1975-1989

	1975	1989
Male:		
High	6.83	8.72
Middle	75.82	66.58
Low	17.36	24.70
Female:		
High	3.67	9.12
Middle	70.83	57.64
Low	25.50	33.25

Source: King et al. (1992, Table 1, p.395)

Panel B: Australian Employment Growth by Earnings Quintiles - 1976-1990 (Thousands)

Quintile	Full-Time Non-Managerial Employees (May Survey)		All Male Employees (August Survey)
	Male	Female	
First (Lowest)	176	114	279
Second	-51	24	-14
Third	-82	54	-24
Fourth	15	104	45
Fifth (Highest)	94	50	196

Source: Gregory (1993, Table 1, p.67)

Table 3: Average Weekly Earnings by Age - Full-Time Employees in Main Job - LFS - 1975-1994

	1975	**1979**	**1982**	**1986**	**1990**	**1994**
A. Males						
15-19	50.0	48.2	46.2	43.5	44.1	41.1
20-24	79.5	75.7	75.3	71.4	71.4	65.1
25-34	96.5	93.7	92.3	90.0	91.1	86.0
35-44	100	100	100	100	100	100
45-54	97.1	96.1	95.3	96.4	97.0	98.6
55-59	93.6	93.2	93.4	91.1	91.2	87.7
60+	82.7	84.4	85.4	85.9	84.8	82.7
B. Females						
15-19	64.5	61.6	57.0	53.9	52.1	50.3
20-24	97.6	95.0	87.6	84.4	82.1	79.4
25-34	105.9	108.8	103.7	103.2	99.6	99.6
35-44	100	100	100	100	100	100
45-54	99.3	100.5	95.2	95.1	92.9	95.1
55-59	102.6	102.6	97.0	94.3	89.4	91.2
60+	99.3	101.6	94.4	87.1	87.7	88.6

Source: ABS, Weekly Earnings of Employees (Distribution) Australia, catalogue no.6310.0.

Table 4: Average Earnings By Level of Educational Attainment - Full-Time Full-Year Workers - 1968/69-1989/90

	Not Completed High School	Completed High School	Trade Qualification/ Diploma	University Degree
A. Males				
i. Annual Earnings				
1968/69	100	113.9	131.3	235.2
1973/74	100	111.9	124.9	207.8
1978/79	100	108.4	121.1	187.1
1981/82	100	99.1	117.1	178.9
1985/86	100	105.2	122.1	171.2
1989/90	100	107.4	120.4	180.4
ii. Weekly Earnings				
1982	100	108.1	125.6	171.4
1986	100	106.7	124.1	168.0
1990	100	106.7	125.1	174.2
B. Females				
i. Annual Earnings				
1973/74	100	109.7	135.8	208.1
1978/79	100	109.2	124.3	169.8
1981/82	100	109.5	121.6	174.3
1985/86	100	109.0	124.8	167.9
1989/90	100	105.4	125.2	170.4
ii. Weekly Earnings				
1982	100	107.6	128.0	138.5
1986	100	101.4	124.5	133.2
1990	100	107.2	122.5	134.6

Note: For Annual Earnings - Not Completed High School = Left school at 16 years of less; and Completed High School = Left school at 17 years or above and do not have higher qualification.

Source: (i) Annual Earnings: ABS, Income Distribution Australia, 1968-69, catalogue no.6502.0; ABS, Social Indicators no.3, 1980, catalogue no.4101.0; ABS, Income Distribution Australia, 1978-79, catalogue no.4108.0; ABS, Social Indicators no.4, 1984, catalogue no.4101.0; ABS, 1986 Income Distribution Survey, Persons with Earned Income, Australia, catalogue no.6546.0; and ABS, 1990 Income Distribution Survey, Persons with Earned Income, Australia, catalogue no.6546.0; (ii) Weekly Earnings: ABS, Income Distribution Survey, Unit Record File, 1981/82 - 1989/90.

Table 5: Degree/NCHS - Ratio of Average Annual Earnings By Cohort - Full-Year Full-Time Workers - 1968/69-1989/90

Cohort	1968/ 69	1973/ 74	1978/ 79	1981/ 82	1985/ 86	1989/ 90
A. Male						
35-44 (1968/69)	2.35	2.14	2.00	2.06	2.17	2.13
25-34 (1968/69)	2.01	1.92	1.83	1.83	1.86	1.97
15-24 (1968/69)		1.78	1.54	1.55	1.55	1.67
15-24 (1973/74)		1.60	1.57	1.46	1.47	1.60
15-24 (1978/79)			1.60	1.52	1.47	1.54
15-24 (1981/82)				1.56	1.49	1.57
15-24 (1985/86)					1.53	1.67
15-24 (1989/90)						1.74
B. Female						
25-34 (1973/74)		1.96	1.62	1.84	1.70	1.77
15-24 (1973/74)		1.83	1.61	1.47	1.56	1.64
15-24 (1978/79)			1.63	1.54	1.50	1.61
15-24 (1981/82)				1.58	1.46	1.58
15-24 (1985/86)					1.40	1.54
15-24 (1989/90)						1.50

Source: ABS, Income Distribution Australia, 1968-69, catalogue no.6502.0; ABS, Social Indicators no.3, 1980, catalogue no.4101.0; ABS, Income Distribution Australia, 1978-79, catalogue no.4108.0; ABS, Social Indicators no.4, 1984, catalogue no.4101.0; ABS, 1986 Income Distribution Survey, Persons with Earned Income, Australia, catalogue no.6546.0; and ABS, 1990 Income Distribution Survey, Persons with Earned Income, Australia, catalogue no.6546.0.

Table 6: Decomposition of Sources of Change in Variance of Log Weekly Earnings - Full-Time Employees - IDS - 1982-1990

a. Males

	Total Change in Variance	Change in Observable Skills	Change in Return to Observable Skills	Change in Unobservable Skills and Return to Unobservable Skills
All	0.015	0.002	-0.008	0.021
Percentiles				
0-20	-0.006	0.001	-0.005	-0.002
20-80	0.005	0.001	0.000	0.004
80-100	0.021	0.003	0.000	0.018

b. Females

	Total Change in Variance	Change in Observable Skills	Change in Return to Observable Skills	Change in Unobservable Skills and Return to Unobservable Skills
All	-0.003	0.008	-0.021	0.010
Percentiles				
0-20	0.001	0.006	-0.006	0.001
20-80	0.004	0.000	0.000	0.004
80-100	0.011	0.011	-0.011	0.012

Note: '0-20' denotes all employees with earnings at or below the 20th percentile of the distribution of earnings. Other groups are similarly defined.

Source: ABS, Income Distribution Survey, Unit Record File, 1981/82, 1985/86, 1989/90.

Table 7: Variance Decomposition - Log Real Weekly Earnings - Full-Time Employees in Main Job - 1986-1994

	Males	Females
Total Percentage Change in Variance of Log Real Weekly Earnings	.0561	.0142
Effect of:		
Change in Union Density	.0169	.0022
Change in Union/Nonunion Earnings Differential	-.0005	.0002
Change in Variance Union Earnings	.0004	-.0038
Change in Variance Nonunion Earnings	.0393	.0156

Source: Unpublished data from ABS, Trade Union Members Australia, catalogue #6325.0.

Table 8: Distribution of Family Income - Individuals - Australia - IDS - 1981/82 - 1989/90

	Gini Coefficient 1981/82	1989/90	Change in Gini Coefficient
Business/Trust Income	0.890	0.927	+0.037
Investment Income	0.870	0.871	+0.001
Wage and Salary Income	0.493	0.500	+0.007
Market Income	0.412	0.444	+0.032

Note: Market Income equals private or pre-government intervention income.

Source: Harding (1996, p.286).

Table 9: Changes in 90-10 Percentile Earnings Differentials
by Country - Males

1. United States   Time Period: 1976-1988

Measure: Change in 90-10 percentile difference in log weekly earnings - Full-time employees

Change: 25.0%

2. United Kingdom   Time Period: 1975-1987

Measure: Change in 90-10 percentile difference in log weekly earnings - Full-time employees

Change: 22.0%

3. Canada   Time Period: 1980-1985

Measure: Change in 90-10 percentile difference in log weekly earnings - Full-time employees

Change: 15.0%

4. Australia   Time Period: 1975-1987

Measure: Change in 90-10 percentile difference in log weekly earnings - Full-time employees in main job

Change: 14.0%

5. France   Time Period: 1979-1987

Measure: Change in 90-10 percentile difference in log hourly earnings - Full-time, full-year employees

Change: 3.0%

6. Germany   Time Period: 1983-1988

Measure: Change in 90/10 annual earnings ratio - Full-time, full-year employees

Change: -7.0%

7. New Zealand   Time Period: 1984-1994

Measure: Change in ratio of 90-10 percentile difference in log hourly earnings and median log hourly earnings - All employees

Change: 9.8%

Sources: United States - Juhn et al. (1993); United Kingdom - Schmitt (1993); Canada - Davis (1992); Australia - ABS, Weekly Earnings of Employees (Distribution) Australia, catalogue no.6310.0; France - Katz et al. (1993); Germany - Abraham and Houseman (1993); New Zealand - Dixon (1996).

Data Sources

A. Labour Force Survey

From 1975 onwards each year in a supplementary (August) survey to the household-based Labour Force Survey the ABS has collected information on the weekly earnings of employees. This information is reported in ABS, Weekly Earnings of Employees (Distribution) Australia, catalogue no.6310.0. The earnings variable is weekly earnings in main job for full-time employees. Earnings are the amount of last 'total pay' from wage and salary jobs prior to the survey interview. Information is available on the distribution of earnings and on average earnings for all employees and for disaggregated age and industry categories. Information on the distribution of earnings is the number of employees with weekly earnings in fixed monetary intervals (for example, less than $80, $80-$120,...).

B. Survey of Employee Earnings and Hours

From 1975 onwards each year (excluding 1982 and 1984) the ABS has undertaken the firm-based Survey of Employee Earnings and Hours. One component of the survey involves collection of information on weekly earnings of employees. This information is reported in ABS, Distribution and Composition of Employee Earnings and Hours - Australia, catalogue no.6306.0. The earnings variable (available on a consistent basis over the sample period) is total weekly earnings of full-time non-managerial employees. Earnings are weekly earnings for the sample period attributable to award, standard or agreed hours of work plus overtime earnings. Earnings from bonus payments, commissions and overaward payments are included in the measure, but retrospective payments, payments in advance, or severance payments are excluded. Information is available on the distribution of earnings and on average earnings for all employees and for disaggregated sector and occupation categories. Information on the distribution of earnings is the number of employees with weekly earnings in fixed monetary intervals (for example, less than $80, $80-$120,...). Due to changes in the types of businesses included in the Survey, and in the definition of full-time and part-time employees, it is not possible to directly compare data on the distribution of earnings from the Survey of Employee Earnings and Hours from before 1981 and after 1983.

C. Income and Housing Survey

On six occasions between 1968/69 and 1989/90 the ABS has undertaken a household-based Income and Housing Survey (generally referred to as the Income Distribution Survey). One component of this survey involves collection of information on earnings of household members. Two types of data on earnings are available from the survey. First, for each survey information on average total annual earnings of full-year full-time employees disaggregated by age and level of educational attainment are available. Second, for the 1981/82, 1985/86, and 1989/90 surveys unit-record information on weekly and annual earnings in main job of full-time employees can be obtained. These individual-level earnings data can be matched with information on the labour force status and demograhic characteristics of each person in the survey.

Figure 1a: Adjusted Real Weekly Earnings by Percentile - Full-Time Male Employees in Main Job - 1975-1995 (August)
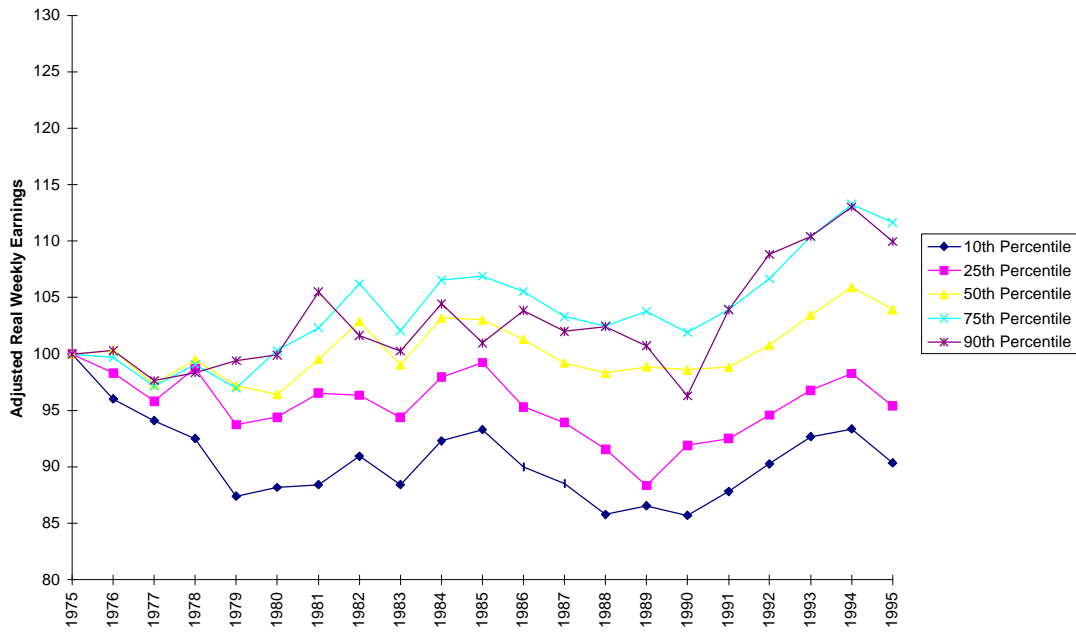
Figure 1b: Adjusted Real Weekly Earnings by Percentile - Full-Time Female Employees in Main Job - 1975-1995 (August)
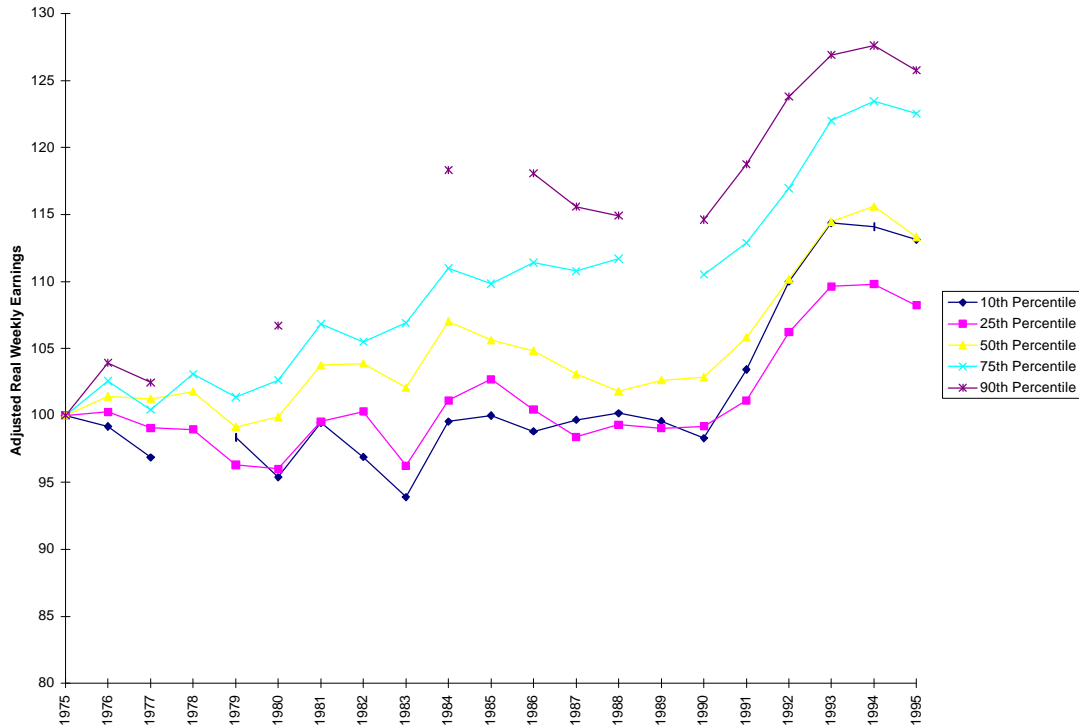
**Figure 2: Change in Log Real Weekly Earnings by Decile - Full-Time Employees in Main Job - 1975-1995
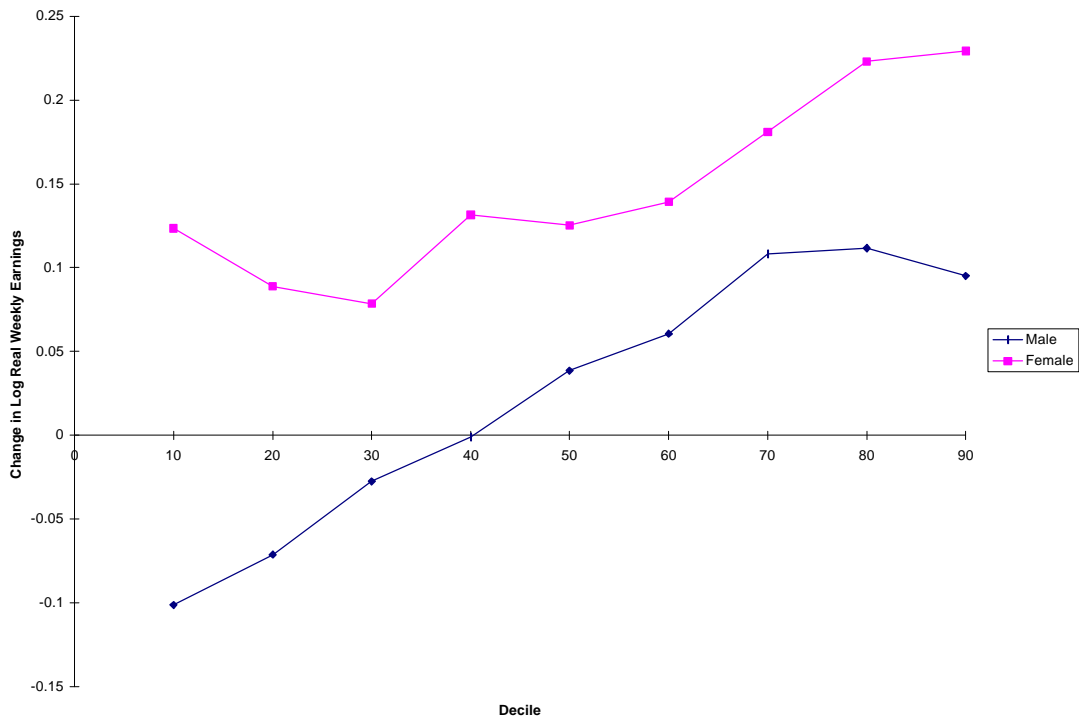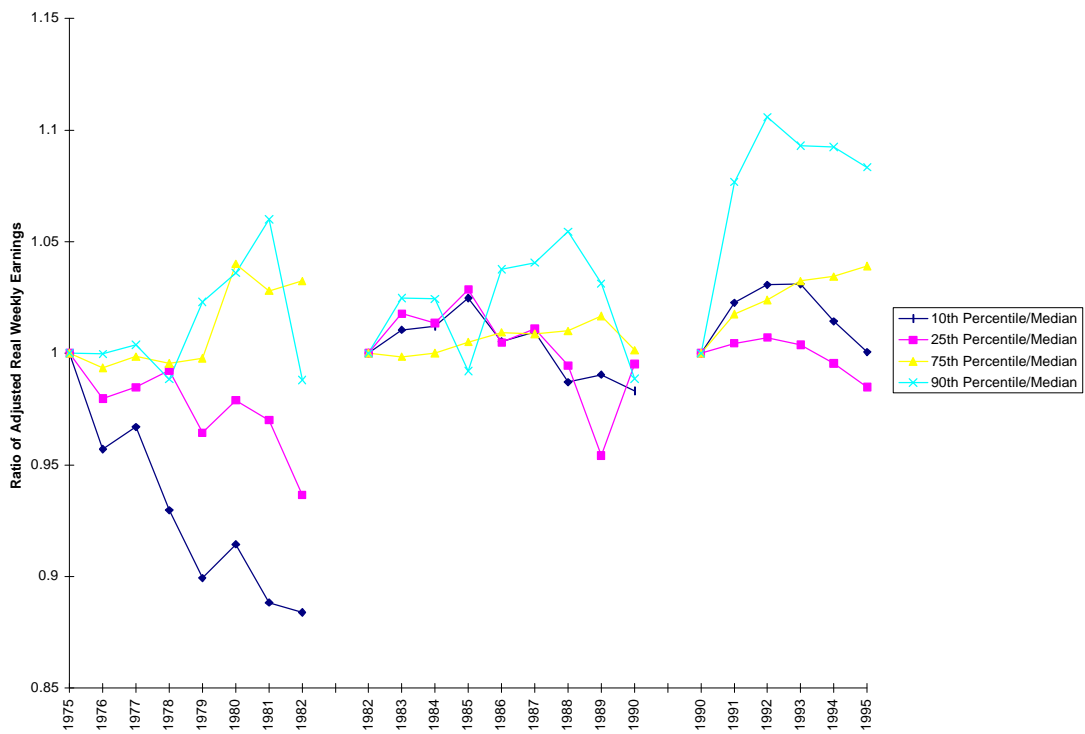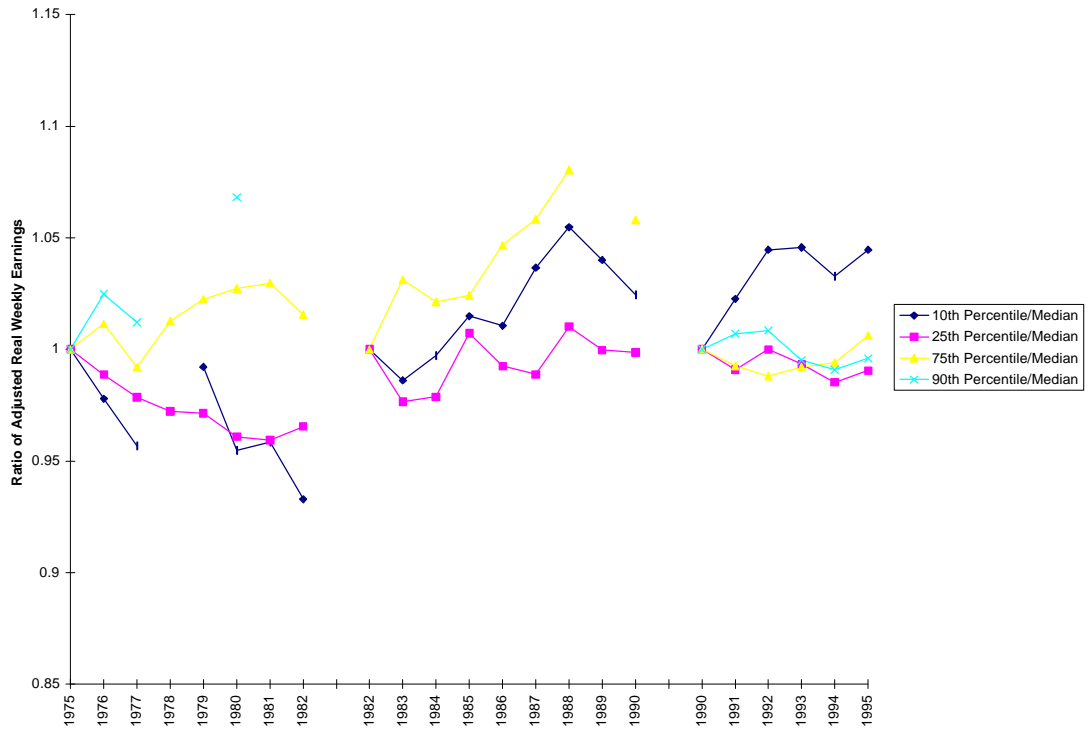(August)**

**Figure 3a: Ratio of Adjusted Real Weekly Earnings by Percentile - Full-Time Male Employees in Main Job
- 1975-1995 (August)**

Figure 3b: Ratio of Adjusted Real Weekly Earnings by Percentile - Full-Time Female Employees in Main Job - 1975-1995 (August)

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