THE ROLE OF LABOUR COSTS IN THE YOUTH LABOUR MARKET: 
AN OVERVIEW OF THE EVIDENCE

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ABSTRACT

In recent years there has been a proliferation of studies examining the effects of changes in labour costs on the teenage labour market. These studies address a wide range of issues, including employment, unemployment and labour supply responses, changes in the distribution of the workforce across industries and between full and part time jobs, changes in the income distribution, changes in schooling behaviour. This paper undertakes the important task of reviewing the empirical evidence, and commenting on the applicability of the major overseas research findings to the Australian youth unemployment problem. There are a number of valuable lessons to be learned from our review. First, the evidence on the direction of effects of changing labour costs is probably not open to dispute: higher labour costs lower employment and increase unemployment. However, obtaining precise magnitudes of these effects is rather difficult. Second, the evidence on wage elasticities reported in a large number of recent overseas studies examining the effects of minimum wages is not directly relevant to the Australian teenage labour market. Third, and perhaps the most important finding, the own-wage elasticity of teenage employment demand exceeds unity. Fourth, changes in wage rates are not an efficacious policy for altering the distribution of income.
INTRODUCTION

In recent years there has been a proliferation of studies examining employment and unemployment responses to changes in labour costs. A large number of these have been concerned with estimating the deleterious effects of legislated minimum wage changes. Overseas research, particularly in the United States and Canada, dominates this literature. And while the institutional framework in the United States and Canada differs from that in Australia, there are undoubtedly many valuable lessons to be learned from the overseas studies. Knowledge not only of empirical results but also of research methodology may be beneficial to furthering our understanding of the likely impact of labour costs on teenage labour demand and supply in Australia.

The potential importance of the research findings can be immediately gained if we articulate just two major findings. First, the elasticity of teenage employment with respect to the minimum wage appears to be modest, ranging from -0.1 to -0.3. Second, the own-wage elasticity of teenage employment exceeds -1.0.

Thus, it appears that a careful review of this research has much to offer. The benefits to be derived include not only an increased awareness of empirical results such as those just mentioned, but also an appreciation of the limitations of the studies, and the setting up of a framework within which the applicability of the overseas findings to current Australian policy on youth unemployment may be evaluated. This paper, therefore, undertakes the important task of surveying research on the impact of labour costs on the youth labour market and commenting on the applicability of the major overseas research findings to the Australian youth unemployment problem.

* Financial assistance from the Bureau of Labour Market Research is acknowledged. The views expressed are those of the author, however, and should not be attributed to the Bureau of Labour Market Research. Helpful comments have been received from Fred Gruen, Keith Mackay, Paul Paterson and Ralph Smith.
The paper is structured as follows. Section II presents some preliminary remarks on the themes of the research. Themes highlighted include the difference between the influence of minimum wages and the influence of average labour costs, and the distinction between employment and unemployment effects. Section III examines empirical evidence on the impact of labour costs on the teenage labour market. It has three sub-sections. First, issues of model specification are reviewed. Included are an examination of the 'control' variables suggested for inclusion in the estimating equation, and the suitability of labour cost measures generally used. Second, the results from a number of overseas studies are summarised, and issues of conflict and consensus pinpointed. The following issues are covered: labour supply, employment and unemployment elasticities with respect to labour costs; income distribution effects. Third, the Australian evidence is reviewed. Section IV examines the impact of changes in legislated minimum wages on average wages. The collation and comprehension of the evidence on this issue is a pre-requisite to the correct application of overseas research findings to the Australian youth unemployment problem. It indicates, for example, whether the evidence on the influence of minimum wages (with an estimated employment elasticity of around \(-0.1\)) or that on the influence of average labour costs (estimated employment elasticity in excess of \(-1.0\)) is more appropriate for use when addressing Australian labour market problems. Section V provides a brief summary of the major findings.

II THEMES IN THE LITERATURE

II (a) Theoretical Basis of the Estimating Equation

The competitive framework has provided the theoretical basis for the majority of analyses of the influence of labour costs in the youth labour market. This framework is demonstrated for a homogenous factor in Figure 1.
There is a unique real wage \( W_0 \) which equates labour supply and labour demand. At any wage other than \( W_0 \) the forces of excess demand or excess supply cause the wage to return to the equilibrium level.

In many cases, however, the labour market might more realistically be characterised by real wage rigidity than by the flexibility of wages assumed by the perfect competition model. Thus, suppose the real wage is fixed (by fiat) at \( W_1 \), a level higher than the wage which would prevail under perfect competition, \( W_0 \) (see also Rees (1979), pp.63-65). Transactions must take place at wage \( W_1 \) - individuals who are unable to secure employment at the prevailing wage are prevented from supplying labour at a wage lower than \( W_1 \). No forces are thus set up to return the market to the free market equilibrium. At wage \( W_1 \), labour supply \( (N_2) \) exceeds labour demand \( (N_1) \). Numbers employed are, however, constrained by the voluntary nature of labour contracts to be the lesser of the two quantities. The \( N_1 \) jobs must be rationed among the \( N_2 \) workers. Thus \( N_2-N_1 \) persons, the difference between labour supply and labour demand, are involuntarily unemployed.
A number of points about this analysis are worth emphasizing. First, employment is lowered by the imposition of a wage above the level of the equilibrium wage. Second, individuals who are employed are better off as a result of the higher wage. Third, numbers unemployed ($N_2 - N_1$) comprise (i) individuals directly disemployed by the imposition of a higher real wage ($N_2 - N_1$), (ii) individuals induced into the market by the higher monetary rewards to labour market activity ($N_2 - N_1$). This unemployment is involuntary. Fourth, the unemployment rate is given by the expression

$$(N_2 - N_1)/N_2.$$ 

Description of the perfectly competitive market with a homogeneous labour input invariably precedes the estimation of ad hoc specifications of single equation models of the form:

$$Y = f(M, D, X_1, \ldots, X_n) \quad (1)$$

where,

$Y$ = measure of labour force status

$M$ = measure of minimum wage

$D$ = business cycle variable

$X_1, \ldots, X_n$ = other factors thought to determine youth labour force status.

One alternative approach to the estimation of the effects of labour cost changes may be termed the disaggregated approach. This recognizes that different labour force groups possess varying levels of skills, and they thus should be entered as distinct inputs into the production function. The desirability of a disaggregated approach has been emphasized by Abood and

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1. This is the usual text-book illustration of the effects of minimum wages. One recent development of this model has been to distinguish between two sectors: 'covered' where firms are required to pay minimum wages, and 'uncovered'. Flexible wages in the 'uncovered' sector are a means of moderating the unemployment rate effect discussed. Such a distinction was quite important in the United States in the 1960's and 1970's, but is less so today given the relatively small size of the 'uncovered' sector. The distinction seems less relevant in the Australian institutional framework, although both part-time work and self-employment may correspond to the United States' 'uncovered' sector.
Killingsworth (1981), Hasenrath (1981) and Brown (1981), among others. Such emphasis stems from the recognition that it is only with a properly disaggregated model that the full extent of substitution effects can be appreciated.

The theory of the demand for factor inputs suggests that a change in the price of one factor will, with all other factor input prices held constant, change quantity demanded according to the rule [Allen (1938)]

\[
\frac{\partial X_a}{\partial a} \cdot \frac{W_a}{X_b} = C_a (c_{ab} - \eta)
\]

where \(X_b\) is the quantity demanded of factor \(b\), \(W_a\) is the wage of factor \(a\), \(C_a\) is the proportion of total costs going to factor \(a\), \(\eta\) is the price elasticity of demand for the commodity produced, and \(c_{ab}\) is the elasticity of substitution (holding output constant) between inputs \(a\) and \(b\).

Equation (2) indicates that if the price of factor \(a\) increases, demands for all factors are affected. Furthermore, the effect for each factor is decomposed into two components. First, there is an output effect, brought about because the factor price increase alters the cost of production and hence commodity price, which will in turn influence the amount of the commodity sold. This output effect results in an equi-proportional decrease in the demand for all factors. Second, there is a (output constant) substitution effect. Factor \(a\) has been made relatively more expensive than other factors, and so it pays to substitute other factors for it in production. Thus, demand for factor \(a\) will decrease (\(c_{ab}\) can be signed unambiguously from theory). Demand changes for the other factors cannot be determined \textit{a priori}; using Allen's (1938) terminology, factors of production may be either competitive \((c_{ab} > 0)\), or complementary \((c_{ab} < 0)\)^2 in production.

2. For the case of more than two factors.
Thus, consider a reduction in the wages of unskilled teenagers. Theory suggests that this will lead to an increase in the employment of unskilled teenagers. The same theory, however, prompts the interesting questions: At whose expense is this increase in unskilled teenagers’ employment? Is it associated with reductions in the employment of other teenage groups (e.g., skilled teenagers)? Reductions in the employment of adults males? Reductions in the employment of adult females? Reductions in the desired capital stock?

The determination of these substitution effects is quite important. In examining substitution effects the researcher should pay particular attention to the theoretical content of the model used to derive an estimating equation. As is generally agreed among economists, the theoretical model provides a framework within which empirical results can be interpreted, and also provides restrictions from factor demand theory on the functions to be estimated; restrictions which can be tested, or imposed to increase estimator efficiency [see Hazenmesh (1981)]. Furthermore, it is also apparent that considerable effort ought to be expended identifying the different skill groups among which substitution effects are thought likely. As shown in the next section, the aggregation of various skill categories has been responsible for a degree of confusion in the literature, and is regarded as a major shortcoming of recent literature [Linneman (1982)].

Two methods in the spirit of the above have been employed in the literature. First, cost/production functions have been estimated, with the translog [see Varian (1978)] being among the more popular. Second, systems of factor demand equations have been estimated. These generally take the form:

\[ X_i = X_i(W, Y) \]

where \( X_i \) is the \( i \)th factor input, \( W \) is a vector of factor prices, and \( Y \) is the level of output. Restrictions from demand theory such as the cross
price effects being symmetric may be either tested or imposed. So long as proper account is taken of the cross-equation restrictions suggested by theory, the above procedures are equivalent [Varian (1979)].

II (b) Minimum Wage versus Own Wage Elasticities

Analysis of a heterogeneous labour input raises the following issue. Within the teenage employment aggregate there are groups of workers who should be distinguished on the basis of their skill level. For the purpose of this exposition we consider two groups: the first termed 'unskilled', and the second 'skilled'. We assume that the unskilled group receive the minimum wage and the skilled group receive a wage in excess of the minimum. In other words, the minimum wage is assumed to be directly relevant only to the employment of unskilled workers. Their employment can therefore be termed 'at risk' from minimum wage changes. Analogously, the skilled groups' employment may be termed 'not at risk' from minimum wage changes.

Own wage elasticities of employment demand measure the response of a groups' employment to a change in its wage rate. Each teenage skill group has an own-wage elasticity. In calculating this elasticity the relevant wage rate would be the minimum wage for the group of unskilled workers, and a higher market wage for the group of skilled workers. Another elasticity measure which has been used in the literature is the minimum wage elasticity of employment demand. This measures the effect upon total (unskilled plus skilled) employment of a change in the minimum wage. The minimum wage, however, corresponds to the own wage of only a portion of the employed.

Which elasticity is to be preferred depends upon the task at hand. For some purposes the minimum wage elasticity may appear to be the relevant concept. For example, the teenage labour market magnitude upon which most people focus is the aggregate teenage unemployment rate; policy makers might therefore be interested in how this magnitude responds to changes in
one policy instrument, minimum wages. For other purposes, however, the minimum wage elasticities will be far from ideal. For example, if we are interested in the effects of minimum wages on the employment of the workforce at risk (unskilled workers) then an own-wage elasticity of employment demand for unskilled workers would be appropriate. The key question then is the relationship between the elasticity of total employment with respect to the minimum wage (which is what is typically measured in minimum wage studies) and the elasticity of unskilled employment with respect to the minimum wage [Brown, Gilroy and Kohen (1981a)]. There are two reasons for expecting the minimum wage elasticity to provide an underestimate of the own-wage elasticity of employment demand for unskilled (or low-wage) workers. First, the minimum wage elasticity is diluted by the inclusion of skilled workers not directly affected by minimum wage changes [Gremlich (1976)]. Second, following minimum wage changes there may be substitution of skilled workers for unskilled workers within the aggregate category examined [Gremlich (1976), Brown (1981)].

If labor market data allowed researchers to identify low-wage workers [see Linneman (1982)] the above categorization would be redundant; the minimum wage elasticity would then be equivalent to the own-wage elasticity for the group of low-wage workers. Unfortunately, limitations on the data available generally force the researcher to analyze groups of teenagers that include both minimum wage and above minimum wage workers. One of the aims of this review is to determine which concept portrays the pattern of response likely to prevail in Australia. Section IV is devoted to this task. In the meantime the review shall cover both categories of estimates.

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3. A further difficulty with the minimum wage elasticity is that whilst the wage of minimum wage teenagers alters, so too does the wage of minimum wage adults. An increase in the wage of minimum wage adults, ceteris paribus, would tend to raise teenage labour demand. For further elaboration on this theme, see Brown (1981).
II (c) Employment versus Unemployment Effects

Analysis of the competitive model indicates that at an above equilibrium wage rate, numbers unemployed are equal to the gap between the labour supply and labour demand curves. A theme of the recent literature, however, has been that there will be no simple relationship between excess supply at above equilibrium wages as read from the conventional graphical analysis of the competitive market (see Figure 1), and available measures of unemployment [Welch (1974)]. The general difficulty of accurately measuring the unemployed in the face of a hazy distinction between the unemployed and the 'not in the labour force' categories [eg: Clark and Summers (1979)] is compounded by the difficulties associated with discouraged and encouraged worker effects [Fisher (1973)]. That these effects are non-trivial is demonstrated by Mincer's (1976) finding that no more than a third of the employment loss appears as unemployment.

Because of this deviation of official unemployment figures from the number suggested by theoretical analysis, most recent empirical work [eg: Mincer (1976), Ragan (1977), Sadinsky (1988)] has preferred to examine employment equations rather than unemployment equations. Brown, Gilroy and Kohen (1981a) put forward three reasons why a focus on employment is preferred to a focus on unemployment. These are: (i) it escapes from the discouraged and encouraged worker effects, (ii) a focus on employment allows one to distinguish between full-time and part-time employment, (iii) employment data appear to be of a superior quality than unemployment data (at least in the United States), especially in relation to the adverse effects of changes in the methods of collecting statistics which have had less effect upon employment counts than upon unemployment counts.

If the preferred approach is to concentrate upon employment equations, unemployment rate effects associated with minimum wages can still be derived. What is required is the estimation of a labour supply equation.
Then, the estimated employment and labour supply equations can be used to derive the unemployment rate effect as follows:

\[ \Delta n = (1 - \mu) \left( \frac{\Delta L}{L} - \frac{\Delta E}{E} \right) \] \hspace{1cm} <3>

\[ \eta_u = \frac{E}{U} (\eta_L - \eta_E) \] \hspace{1cm} <4>

where,

\( L \) = labour supply
\( E \) = employment
\( U \) = numbers unemployed
\( u \) = unemployment rate
\( \eta_L \) = elasticity of labour supply with respect to the wage

This is referred to as the indirect method of deriving unemployment rate effects. Results obtained using this approach will in general differ from those obtained when the direct method of examining unemployment rate equations is used. Moreover, there is no presumption that they will differ in a consistent way.

II (d) Mitigating Factors

The minimum wage literature is replete with suggestions as to why the imposition of an institutionally determined wage may have less impact than indicated by analysis of the competitive model. The suggestions include the presence of monopoly power, public sector employment, segmented labour markets, non-wage costs, induced increases in labour force efficiency. In this sub-section we review two potential labour market reactions to increased wages, namely the substitution of wage for non-wage costs, and induced increases in worker efficiency. These are addressed as they appear to underly some current Australian debate.
(i) Implications of Higher Youth Wages for the Compensation Package

It has been suggested that employers may react to higher youth wages by altering the structure of the compensation package associated with the job rather than reduce numbers employed. For example, wage payments may be substituted for non-wage payments (fringe benefits, clean up time, employment stability). Moreover, if the labour contract is viewed as covering a number of periods, the employer may substitute wages today for wage growth (i.e., higher future wages) [see Lazonick and Miller (1981)]. Simply stated, what employers give today they may take back tomorrow. A result of this substitution is that age-earnings profiles are twisted in a clockwise manner. This has important implications for labour market behaviour. In an unconstrained equilibrium, the wage package components will be in their optimum proportions. However, in the constrained optimum subsequent to the institutionally imposed wage the compensation package will no longer be in the optimal proportions. Consequently, some workers may withdraw from the labour market. The extent of any labour force withdrawal will ultimately depend upon the substitutability of current wages for other forms of compensation. If they are close substitutes, the employment effects will be minimal: the minimum wage will thus have altered the structure of, but not the total amount of, compensation. Conversely, if current wages and other forms of compensation are not easily substitutable.

The applicability of this compensation package components switching hypothesis to Australian conditions appears clouded, however. It implies that trade unions will acquiesce to the switching of wages for paid leave or fringe benefits. While some unions have, of late, been seen to agree to wage cuts in return for employment maintenance it is unclear that such behaviour can be generalised. The one component of the compensation package which may be altered, because it is less obvious, is wage growth: higher current wages may be offset by lower wage growth in subsequent years.
(ii) Shock Effects

Several writers have proposed that increases in institutionally determined wages might be associated with improvements in managerial efficiency. As West and McKee (1980) point out, this idea has parallels with Leibenstein's theory of X-inefficiency. It rests on the proposition that there is a certain amount of slack or inefficiency in the production process (that is, firms produce their output at a cost which is above the level that is theoretically attainable). A wage increase which threatens the financial viability of the firm will encourage (shock) management to eliminate this slack, through better supervision, planning and control. The shock effect has, however, found little support among academic economists. Most find it difficult to imagine management repeatedly rationalising procedures so as to increase productivity of all factors in response to successive wage increases [Rees (1979)]. To the extent that firms operate in a competitive environment they are already under a great deal of pressure to be efficient. Even more telling is the observation "that management is regularly 'shaken up' every time there is a recession, and that to the extent that the minimum wage increase causes a shake up it only advances the date of the inevitable reckoning which faces any inefficient management in a small, marginal firm" [Pettengill (1981)].

An alternative explanation for the presumed increase in productivity following an increase in institutionally determined wages places emphasis upon workers' effort. Workers, presented with the choice between improved efficiency and being retrenched, might be motivated to increase their productivity. This line of argument, sometimes referred to as the 'economy of high wages', effectively endogenises worker effort. Pettengill (1981) attempts to model this. Worker effort is viewed as a composite of the pace at which a person is willing to work, his willingness to show up for work regularly and punctually, his willingness to obey orders. Each worker is
faced with a trade off between the psychic costs of expanding more effort, and the increase in wage that could be obtained thereby. An optimal level of effort will be chosen. Pettengill thus characterizes (at least) some low wage earners as individuals who have rationally chosen low-effort jobs.

Minimum wages restrict the range of effort-wage combinations open to the individual. If low wage jobs are eliminated by a minimum wage, low-wage workers have a choice of either increasing their productivity to a level commensurate with the minimum wage, or be unemployed/withdraw from the labour force. Two categories of individuals may be distinguished. First, there are workers who will be unable or unwilling to meet the new productivity standard; they will be dismissed. Second, there are workers who remain employed but earn the higher minimum wage at the cost of more effort. Pettengill’s model, therefore, predicts that some sub-(new)minimum wage workers will be employed at the new minimum wage; hence the disemployment effect will be less than suggested by the competitive model.

The similarity between this argument and that used in the 35 hour week campaign in Australia suggests that it should be given careful consideration.

II (e) Income Distribution Effects

From a theoretical perspective, it appears that the efficiency of the labour market is likely to be impaired by institutionally determined wages. Thus, a reasonable question to ask is: What justifications are advanced for such labour market intervention? It is usually suggested that minimum wages are needed to ensure that all workers receive a “living” wage, and that they are a useful policy instrument in the war against poverty. These ideals,

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4. Stigler (1946) refers to the possibility that some low-wage workers might raise their productivity following an increase in the minimum wage.
under the cloak of a "fair and reasonable wage", appear to underly many of the decisions of wage fixing bodies in Australia [see Niland and Isaac (1977)]. Such rationales have been extensively criticised, however. Needs are generally best related to expenditure units, and the income of expenditure units (households or families) may differ from the income of individuals. Grmalich (1976) points to a number of reasons why the correlation between individual wages and household or family income might not be perfect: irregular hours of work, low-wage secondary workers in high income families, varying family sizes and number of income earners, varying amounts of non-labour income. The implication of a low correlation between wage levels and family income is that minimum wages will never have strong redistributive effects. Stigler (1946) also takes up the argument against minimum wages. He states that most policies aimed at increasing the incomes of the poor impair incentives, and suggests that there are two important questions to be answered. First, does the minimum wage policy promote a reduction in poverty? Stigler believes that it does not, arguing that

The connection between hourly wages and the standard of living of the family is thus remote and fuzzy. Unless the minimum wage varies with the amount of employment, number of earners, non-wage income, family size, and many other factors, it will be an inept device for combating poverty even for those who succeed in retaining employment. And if the minimum wage varies with all these factors, it will be an insane device.

Second, are there efficient alternatives to minimum wage policy for achieving the equity objective? Pointing to the comparative advantages of a negative income tax, Stigler answers this question in the affirmative.

Three additional reasons for decrying the use of minimum wages as a means of eliminating poverty may be noted: (i) A minimum wage by itself provides no income - income depends on hours of work as well as on the wage rate [Ragan (1981)]. Given the potential disemployment effects referred to above, the minimum wage policy instrument might well miss its target. (ii) One possible effect of minimum wages may be to reduce lifetime incomes through curtailing profitable training opportunities. (iii) Some of the
gains may accrue to highly paid workers, through either a bumping up of their wages (to maintain relativities) or an increased likelihood of employment (via the substitution effects discussed above).

Thus, although minimum wages might be seen by policy makers as a means of achieving the goal of equity, it is by no means certain that they will achieve a more equitable distribution, and nor that policy makers will have used the most appropriate policy instrument.

III EMPIRICAL EVIDENCE

III (a) Some Outstanding Issues

In this sub-section we present a brief sketch of a number of methodological issues raised in the minimum wage literature.

(i) Measures of Labour Force Status

The first generation of minimum wage studies [eg: Moore (1971), Lovell (1972)] were mostly concerned with assessing unemployment effects, these being measured by regressing the proportion of the labour force (or population) unemployed against the variables on the right hand side of equation (1). Second generation minimum wage studies [eg: Mincer (1976), Ragan (1977)] have tended to take cognizance of the theoretical perspective advanced by Fisher (1973), Goldfarb (1974), and Mincer (1976) and have estimated the effects of the minimum wage on both the employment - population and labour force - population ratios. Unemployment effects may be derived from the estimated employment and labour supply equations [see Section II (c)].

(ii) Measuring the Cost of Labour

The minimum wage variable incorporated in most studies has generally been based on a minimum wage construct devised by Kaltz (1978). The Kaltz measure focuses upon the ratio of minimum wages to average wages in each
industry, weighted by the proportion of workers covered by the minimum wage legislation. These industry wage ratios are combined into an index in which the weight for each industry ratio is the proportion of total employed persons in the particular industry. In general the index is given by:

\[
\sum \frac{E_i}{E_t} \left[ \frac{M_i}{\text{AHE}} \cdot C_i \right] + \left[ \frac{M_i^*}{\text{AHE}} \cdot C_i^* \right]
\]

where,

- \( E \) = non-agricultural teenage employment
- \( M \) = basic minimum wage rate
- \( \text{AHE} \) = average hourly earnings of non-supervisory workers
- \( C \) = proportion of non-supervisory teenage workers covered by the basic minimum wage rate
- \( M^* \) = minimum wage rate for newly covered workers
- \( C^* \) = proportion of non-supervisory teenage workers covered by the minimum wage applicable to newly covered workers,
- \( i \) = major industry division
- \( t \) = total private non-agricultural teenage employment

This index has two main virtues. First, it focuses upon the ratio of minimum wages to average (market determined?) wages, and to this extent captures the idea that the impact of a given minimum wage would be greater the higher that minimum relative to market determined wages. Second, the index takes account both of changes in coverage and changes in the level of minimum wages in an intuitively appealing manner [Welch (1974)].

Offsetting the above virtues are a number of deficiencies. Hanermeesh (1981) argues that while most interest is on the youth labour market, the Kaitz variable is not specific to that market. Hanermeesh attempts to overcome this by deriving a youth average earnings proxy, calculated by multiplying the average hourly earnings figure in the Kaitz index by the ratio of the earnings of full-time workers 16-24 to those of
all full-time workers. His alternative index measure has only minor effects on the size of (significant) minimum wage effects.

The preceding discussion raises the thorny issue of the purpose of deflation. Lovell (1972) appears to argue that it is simply to deflate nominal wage data to real values [see also Gramlich (1976)]. More popular though is the view [Fisher (1973)] that the primary aim of deflation is to capture the idea that minimum wages will have more effect the higher they are relative to the pre-legislation market clearing wage.5 It is to be noted, however, that the wage ratio just outlined is non-operational, as market clearing wages cannot be observed post-legislation. The operational version of such a wage ratio usually makes the assumption that in the absence of minimum wage legislation the relative wage of persons earning less than the minimum wage would be a fixed proportion of the industrial average wage. Fisher (1973) argues that this assumption will rarely be satisfied, and so will result in errors in measurement, a data problem which will cause a downward bias in the estimated coefficient [Levi (1973)].

The final problems with the minimum wage variable are noted. First, there is a limited amount of variability in the cost measure; as Lovell (1973) and Wachter and Kim (1982) point out, virtually all of the evidence of minimum wage effects has been gleaned from implications of erosion over time of the nominal minimum as prices have risen and labour productivity has grown between the step-like increases in the minimum. Second, following Wachter and Kim (1982) we draw attention to the fact that the government's social welfare legislation programs (minimum wages, direct job creation) are not made independently of each other. Furthermore, these programs may interact. Accordingly, a well-specified employment rate equation should contain separate variables to represent the various government policy initiatives. Wachter and Kim (1982) claim that data and

5. West and Mokee (1988) suggest both purposes are legitimate.
conceptual problems make this impossible. Consequently, they view their minimum wage variable as a proxy for a composite government policy variable.

(iii) Business Cycle

A major difficulty with analysis of minimum wage changes is the separation of wage effects from the influence of other exogenous variables. To illustrate this important point we draw upon an example used by the United States Minimum Wage Study Commission. Consider the influence of the state of the economy. If the minimum wage was increased just as the economy was entering a recession the simple relationship between minimum wages and youth employment we observe would most probably be negative. Conversely, if the minimum wage was increased just as the economy moved into a boom the simple minimum wage - employment level relationship would be likely to be positive. In these two instances employment changes which should be correctly attributed to the state of the economy could be erroneously attributed to the minimum wage change. Simple correlations, therefore, which make no attempt to control for the influence of other exogenous factors, can hardly be advanced as proof of anything. Thus, it is usual for additional control variables to be included in the estimating equation. Typical business cycle measures include prices, age, male unemployment rates (used by Brown, Gilroy and Kohen (1981b)), output levels (Fansmee et al. (1981)), registered vacancy levels (Layard (1982)), and capacity utilisation (Lewell (1972), Acock and Killingworth (1981)). These reflect the state of the overall demand for labour.

(iv) Other Variables

A large number of control variables in addition to business cycle measures have been introduced into the estimated equations. For example, variables designed to control for supply factors such as participation in

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6. This example describes the Australian experience in 1974.
the armed forces [Mincer (1976), Wachtler and Kim (1982)], the influence of manpower training programs [Ragan (1977), Abowd and Killingsworth (1981)], school enrolment rates [Ragan (1977), Gramlich (1976)], potential labour supply [Lovell (1972), Ragan (1977)]. have been included. Time trends, welfare benefits and the composition of aggregate demand are other variables which have been considered for inclusion in the estimating equation. One statistical problem often encountered with this more comprehensive approach is that of multicollinearity [for example, see Wachtler and Kim (1982)].

A number of studies have reported the sensitivity of their 'preferred equation' to the inclusion/exclusion of various regressors.

Lovell (1972) investigates the effects of differences in model specification between two studies which arrive at opposite conclusions as to the effects of minimum wages on unemployment. The studies are Moore (1971) [significant unemployment effects] and Bureau of Labour Statistics (1978) [no unemployment effects]. A number of differences between the studies are identified, including differences in the data base (monthly or quarterly observations), measurement of labour force status (use of unemployment rate or unemployment/population ratio), demographic categories examined. Lovell's replication exercise suggests these differences cannot account for the divergent conclusions reached by the two studies. Instead, the important role played by population structure variables is emphasized. It was only in estimated equations which omitted a variable reflecting the relative supply of teenagers that the minimum wage has an effect upon the level of unemployment. As Lovell points out, such equations imply that an increase in the teenage population relative to the adult population has not materially influenced the teenage unemployment problem. This, Lovell suggests, is a dubious proposition. Hence the Lovell specification which includes relative supply variables gives the result that the minimum wage has no effect on teenage unemployment.
There has, however, been a lack of agreement on the appropriateness of including supply-type variables [such as teenage population share, school enrolment rates, per cent of teenagers in the armed forces] in the estimating equation [Adie and Galloway (1973), Fisher (1973), Lovell (1973), Welch (1974)]. Welch (1974) argues that these variables are simultaneously determined with employment, and hence estimating equations which include them should be treated with caution.\(^7\) He reports that the effect of including them in an equation was to reduce sharply the minimum wage effects, a result which supports Lovell's (1972) earlier finding. Abood and Killingsworth (1981) also report their estimated minimum wage effects to be quite sensitive to the inclusion and specification of population variables. Moreover, they go on to suggest that the relative employment equations (in log form) err if a single population variable [namely $\ln(\text{teen pop/adult pop})$] is included. For such a specification constrains the effects of changes in the populations of teenagers and adults on the employment level of teenagers to be equal in value and opposite in sign, and is therefore overly restrictive. Abood and Killingsworth prefer to use variables reflecting separately the supplies of both teenagers and adults. This re-specification of the population structure variables sharply reduces estimated elasticities of employment with respect to the minimum wage. In addition it had the effect of rendering the estimated minimum wage impacts far less sensitive to the inclusion/exclusion of other potentially important variables. For example, Abood and Killingsworth show that when manpower variables are added to equations which include $\ln(\text{teen pop/adult pop})$ as a variable they cause drastic changes to the magnitude and statistical significance of the minimum wage effect, which is then not significantly different from zero. However, when the same variables are added to an equation which contains the two population structure variables outlined above, their inclusion is demonstrated to have little impact on other

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\(^7\) See also Brown, Gilroy and Kohen (1981b), p.109.
estimated elasticities.

Finally, we note that the O.E.C.D. (1986) refers to the composition of aggregate demand as being potentially important. Goods which are intensive in inputs of youth time should be analysed. Perhaps the spirit of this suggestion could be captured by an industry mix variable, though this does not appear to have been investigated in the literature [one exception is Mattila (1981)].

III(b) Empirical Results: Overseas

Our discussion in the preceding subsection reflects a healthy scepticism towards the empirical results from the minimum wage literature. The studies reviewed have many shortcomings, some of which are serious. In this section we present overseas empirical evidence on labour market reactions to cost changes. We proceed by presenting detailed results from a number of the more reputable studies. This is followed by the presentation of 'consensus' estimates.8

(1) Labour Supply, Employment and Unemployment Effects of Minimum Wages

The studies chosen for detailed analysis are Mincer (1976), Ragan (1977), and Studinsky (1980). These use similar model specifications and econometric techniques, the first two being for the United States and the third for Canada. These studies have been selected so as to provide useful cross-country comparisons.9

Mincer conducts an analysis for 19 age-sex-race groups using quarterly data for 1954-69. The age-sex groups examined are teenagers (aggregated over 16-19 year old males and females), 20-24, 25-64 and 65+ year old males,

8. This presentation draws upon Brown, Gilroy and Kohen (1981a).

9. Studies showing adverse effects of minimum wages on employment could also be presented for Puerto Rico, Chile, Costa Rica—see Rotenberg (1981).
and 28+ year old females. We concentrate on the teenage results in our presentation. Additional control variables included in Mincer’s linear equations are the unemployment rate of prime age males, the fraction of the population group in the armed services, and a quadratic time trend. Mincer notes the time trend is used as a ‘crude substitute for more complex specifications of employment and labour force functions’.

Ragan (1977) analyses the labour market status of 16 teenage sub-groups defined by age (16-17, 18-19), race (whites and non-whites), sex and school enrolment status.10 His data period extends from 1961(I) to 1972(IV), and the estimation framework employed is along the lines of that used by Mincer (1976). The variables in the estimated equations include: minimum wage, seasonal dummies, prime age male unemployment rate, manpower programs, population structure.

The study by Addinksky (1980) examines the labour market position of teenage (14-19 years) males and females in Canada. A pooled time-series cross-section approach is used. These data are annual observations for five major Canadian regions. Employment, labour supply and unemployment equations are estimated, the latter being used in comparisons with unemployment elasticities calculated using the indirect approach [see Section II (c)]. The influence of the following factors on youth labour force status are investigated: prime age male unemployment rate, minimum wages, regional dummies, quadratic time trend.

Employment Effects

Mincer’s estimates indicate that increases in the minimum wage are associated with reductions in teenage employment; the point estimates of elasticities being −0.305 for whites and −0.465 for non-whites. This latter

10. See also Ragan (1981). This later analysis extends the data period to 1978(IV). One result which differs from Ragan (1977) is that non-students are more susceptible to minimum wage changes than students.
estimate was not significant at conventional significance levels, however. Mincer does not discuss, nor present, the estimated effects for the other control variables. Ragan establishes teenage employment to be very cyclically sensitive. A manpower programs variable was largely significant for 16-17 year olds, but did not contribute to the explanation of employment ratios for 18-19 year olds. The population supply variable gave mixed results, having a negative impact in the employment equations for non-whites and a negligible impact in the equations for whites. Turning to the minimum wage variable, it is found to have a negative effect in 12 of the 16 teenage sub-groups analyzed, but is significant in only 7 of these cases. For enrolled females, the effects for the younger age group (16-17) exceed those for the older age group (18-19). The evidence on relative employment effects between the male age groups is ambiguous. The negative effect is more pronounced for students than for non-students, for non-whites than for whites, and for males than for females. For males, the minimum wage coefficient is significant in 5 out of the 8 subgroups. Ragan concludes 'This is strong support for the hypothesis that Federal minimum wage legislation reduces youth employment'. The range of (significant) elasticities reported by Ragan was -0.18 to -1.32 for males, and -0.23 to -0.59 for females.

Svedinsky's empirical results suggest that cyclical factors, as proxied by the prime age male unemployment rate, are not important in the female employment equation. Minimum wages, however, have statistically significant negative effects on employment of both males and females. The elasticity of employment with respect to the minimum wage is -0.18 for males and -0.27 for females (-0.17 for a weighted aggregate of males and females). Thus, minimum wage effects are stronger for females than for males, a result contrary to the evidence for the United States. Svedinsky's empirical

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11. This rather high 'minimum wage' effect was for an enrolled category. When this outlier is removed, the range of significant male elasticities is -0.10 to -0.75.
results do not evidence lagged effects of the minimum wages.

The above results support the conclusion that the employment effects of a minimum wage increase are NEGATIVE (consistent with the predictions of the competitive model). Any number of additional studies could be presented as additional evidence on this point [eg: Gramlich (1976) - elasticity of -0.89 for 16-19 year olds, Kosters and Welch (1972) - elasticity of between -0.24 and -0.36 for 16-19 year olds]. Yet, it must be conceded that the estimated effects vary appreciably. A 'consensus' statement is therefore quite difficult. For such an estimate, however, we turn to Brown, Gilroy and Kohen (1981a). They reviewed nearly two dozen studies of the effects of minimum wages on youth labour market status for the United States Minimum Wage Study Commission. Summarising these studies, Brown, Gilroy and Kohen (1981a) suggest that most employment elasticities fall into a -0.1 to -0.3 range, and draw attention to a cluster around -0.1. They confirm the results of Ragan (1977) that disemployment effects are greater for males than for females, although the differences are slight. Brown, Gilroy and Kohen (1981a) also note a tendency for the disemployment effects to decrease with age. And while white/non-white differences have been studied in a number of studies, there is a lack of consistency in the evidence produced, this being attributed to the relatively small sample size of the non-white group.

Participation Effects

Mincer finds that the minimum wage has a large significant negative effect on the teenage participation rate, with the elasticity being -0.158 for whites and -0.374 for non-whites. The statistical evidence presented by Ragan, however, suggests that minimum wages have not markedly affected labour force participation. Swidinsky reports that minimum wages have statistically significant negative effects on labour supply for both males and females. The elasticity of labour supply with respect to the minimum
wage is -0.08 for males and -0.28 for females. Thus, minimum wage effects are stronger for females than for males. The minimum wage elasticity calculated for a weighted aggregate of males and females is -0.13, and this is similar to Mincer's (1976) result for non-whites.

Thus, again we have a situation of conflicting results. Brown, Gilroy and Kohen (1981b) suggest that the most common finding in the literature is one of labour force withdrawal following a rise in the minimum wage. The size of the estimated labour force effect is varied, though the Brown, Gilroy and Kohen (1981b) result of rough equivalence between employment and labour force elasticities has been reported in a number of studies.

Unemployment Effects

As presented above, Mincer finds that the estimated minimum wage effects on labour supply are less than the estimated effects on employment. Consequently, the unemployment rate effects calculated from the labour supply and employment equations are positive for both white and non-white groups. The effect of non-whites exceeds that for whites.

Roger also calculates unemployment elasticities from the labour supply and employment equations. Over the 16 teenage sub-groups, this elasticity is positive in 12 cases, zero twice, and negative twice, indicating that minimum wage legislation tends to raise youth unemployment. However, this also indicates that the impact of minimum wages varies greatly across the 16 teenage groups examined. Further evidence of this is to be found in the range of the elasticities: from 0.3 to 1.67 for males and from -0.13 to 0.86 for females.

Svidinsky found that the minimum wage effect on employment exceeds that on labour supply for both males and females. Hence, the (indirect) elasticities of unemployment with respect to the minimum wage are positive. For males this elasticity is 0.05, and for females the elasticity is 0.68.
In other words, for males the minimum wage induced disemployment effect is almost exactly offset by the induced labour force withdrawal. For females, the relative sizes of employment and labour supply effects give rise to a strong unemployment effect. These indirect unemployment elasticities are consistent with elasticities derived using the direct method.

The Brown, Gilroy and Kohcn (1981a) survey reveals even more variability in the unemployment rate effects than in the employment effects. However, Brown, Gilroy and Kohcn (1981a) feel that most estimates fall within a 6.0 to 8.3 percentage point range, with the majority of studies reporting an unemployment rate effect of between zero and 8.1 percentage points.\(^{12}\) This is consistent with the labour force and employment effects being similar in size.

(ii) Evidence on Income Distribution Effects

Greenlich (1976) examines the correlation between wages and family income. He establishes that 23 per cent of low-wage adult workers were in poverty status, while only 2 per cent of high-wage workers were. For teenagers, less than 7 per cent of low-wage teenagers were in poverty-line families, while 18 per cent of high-wage teenagers were. Indeed, for teenagers, the median family income of low-wage workers exceeded that of high-wage workers. These facts imply that minimum wages will never have strong redistributive effects. The beneficial effects of an increase in the minimum wage would flow to high-income families as well as to low-income families, thereby negating much of the expected income redistribution effects of minimum wage policy. Further shortcomings of the minimum wage as an income redistributive device have been outlined by Johnson and Browning (1981), and include (i) the relative unimportance of labour income at the bottom of the income distribution implies that a change in the minimum will have only a small impact on the total income of low-income

\(^{12}\) Estimated impact of a one per cent change in the minimum wage.
households. (ii) An effect of the minimum wage is that among those with the same incomes, some gain and other lose. On the surface this appears inequitable.

The simulation studies conducted by Johnson and Browning (1981) also indicate that raising the minimum wage is not a policy that concentrates its benefits on low-income households. And while Johnson and Browning acknowledge that their simulation results flow directly from the assumptions used in the calculations, they report that their basic results are not very sensitive to the exact specification of the model.

By way of summary we note the conclusions of the United States Minimum Wage Study Commission (1981). They state that the minimum wage is relatively ineffective for altering the income distribution; increases in the minimum wage having had only minor effects on the distribution of well-being in the United States.12 And in accord with economic theory, the Minimum Wage Study Commission suggests that policy measures such as direct government transfer payments or a negative income tax would be more effective in reducing poverty than simply relying on the minimum wage.

(iii) Evidence on the effects of average wage costs

A number of studies have addressed the question: What would be the effect on employment if the wages of all members of a labour force category were increased? Hamermash and Grant (1979) present an overview of this evidence. The results from two of the studies they examine, Anderson (1978) and Walsh and Cunningham (1978), are briefly outlined.

Anderson examined substitution effects among the following labour categories: workers under 25 (Y), workers 25-55 (M) and workers aged 55 or more years (O). Demand elasticities among these groups are presented in Table 1.14

12. The findings are equally pessimistic for both individual and family income.

14. This Table is reproduced from Layard (1982).
Table 1 is read as follows. The diagonal cells contain own-wage elasticities of demand. These are all negative, indicating that a decrease in the wage of one category of labour increases demand for that category. For example, consider the number in the first cell, -0.5. This indicates that a 1 per cent reduction in the wages of young workers (Y) induces a 0.5 per cent increase in their employment. The off-diagonal cells in Table 1 contain cross-wage elasticities. These are all positive, indicating that a decrease in the wage for one category of labour causes that type of labour to be substituted for all other types of labour. Thus, the number 0.3 in the first row indicates that a 1 per cent reduction in the wages of young workers (Y) is associated with a 0.3 per cent reduction in the employment of 25-55 year old workers (M).

The study by Welch and Cunningham (1978) focuses on the teenage labour market. They examine substitution possibilities among 14-15, 16-17 and 18-19 year olds. Their estimated demand elasticities are presented in Table 2.

Table 2

DEMAND ELASTICITIES CALCULATED FROM WELCH AND CUNNINGHAM (1978)

<table>
<thead>
<tr>
<th></th>
<th>14-15</th>
<th>16-17</th>
<th>18-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per cent change in employment of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>1</td>
<td>-0.82</td>
<td>-3.03</td>
</tr>
<tr>
<td>M</td>
<td>1</td>
<td>-1.55</td>
<td>3.97</td>
</tr>
<tr>
<td>Wage of</td>
<td>1</td>
<td>-0.22</td>
<td>0.19</td>
</tr>
</tbody>
</table>
The own-wage elasticities of employment demand presented in Table 2 (read down the diagonal) are all negative, and exceed one. This indicates that the employment of each teenage category is quite responsive to variation in its own wage rate. The cross-wage elasticities (in the off-diagonal cells) are not estimated with any statistical precision and so will not be discussed.

As noted previously, the evidence on substitution effects among groups of workers is important for the analysis of the effects of policy such as minimum wage changes. However, as Brown (1981) comments, the available evidence is limited by a concentration by most studies on a youth (14-24 years of age) category, rather than on the teenagers as would be ideal for our purpose. Further shortcomings of the evidence stems from a lack of statistical precision in some of the estimates [eg: Welch and Cunningham (1978)], and the variability of the findings. Despite these problems, Hanemesh and Grant (1979) attempt to provide consensus statements in their synthesis. There are three such statements of interest.

* The own-wage elasticity of demand for young workers exceeds unity. That is, reductions in the teenage wage would be associated with substantial increases in teenage employment.

* All studies suggest that workers are fairly easily substitutable by age. This implies that increases in teenage employment achieved by lowering teenage wages will be associated with some displacement of older workers.

* There is fairly easy substitution of young workers for capital. This means that some of the increase in teenage employment consequent to a reduction in teenage wages will be at the expense of capital.
However, the range of estimates presented in Hamermesh and Grant (1979) illustrates the 'extreme precariousness of the basis of our knowledge'. Indeed, Hamermesh and Grant (1979) urge that more work be undertaken so that the conclusions drawn can be maintained with confidence. It is of considerable interest, therefore, to present the results of a post-Hamermesh and Grant (1979) study: Layard's (1982) analysis of manual workers in manufacturing in the U.K.

Layard (1982) uses a translog cost function to produce estimates of elasticities for manual workers in manufacturing in the U.K. Four categories of workers are distinguished: males less than 21 years of age (referred to as youths), females less than 18 years of age (girls), men, women. His results are displayed in Table 3.

<table>
<thead>
<tr>
<th>PERCENT CHANGE IN EMPLOYMENT OF</th>
<th>Youths</th>
<th>Girls</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>YOUTHs</td>
<td>-1.25</td>
<td>0.82</td>
<td>0.12</td>
<td>0.02</td>
</tr>
<tr>
<td>GIRLS</td>
<td>0.29</td>
<td>-0.31</td>
<td>-0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>WOMEN</td>
<td>0.50</td>
<td>-0.85</td>
<td>-1.59</td>
<td>0.32</td>
</tr>
<tr>
<td>MEN</td>
<td>0.47</td>
<td>0.34</td>
<td>1.55</td>
<td>-0.35</td>
</tr>
</tbody>
</table>

The main feature of Layard's results is that the own-wage elasticity of demand for youths is quite large (-1.25), but that for girls is surprisingly small (-0.31). We also note that there is a high degree of substitutability between some categories of labour: girls are good substitutes for youths, women are quite good substitutes for men. However, women and girls are not good substitutes, and youths and girls are not good substitutes for men.

Layard's elasticities are lower than those presented in Table 1. Hamermesh (1982) attributes this to Layard's assumption that the capital stock is predetermined, and the estimation of a cost function rather than a production function: the characteristics of the U.K. labour market (low
labour supply elasticities) imply production function estimates might be
more appropriate [Hameçem and Grant (1979)].

III (c) Empirical Results: Australian

A number of Australian studies have focussed on the relationship
between real wage levels and employment, unemployment and labour supply.
The majority of these, however, have concentrated on aggregate labour market
magnitudes. Their results are broadly consistent with overseas research
findings: the weight of the evidence is that the long run elasticity of
aggregate labour demand to a change in the real wage appears to be about
-0.5 [Freebairn (1977)]; the wage elasticity of married female labour
supply is around 1.3 [Miller and Volker (1981)]; and real wages are an
important determinant of recent unemployment levels [Johnston, Campbell and
Simes (1978), Jonson, Battelino and Campbell (1978), and Trivedi and
Baker (1982)].

Studies which specifically address the youth labour market problem
include Merrilees (1979), Blandy (1979), Gregory and Duncan (1980).

Merrilees' examination of the Australian teenage labour market problem
utilises a relative (teenage/adult) employment equation similar to that used
by Welch (1974). His analysis is quite comprehensive, investigating the
potential influence of the following factors: average wages; seasonal
influences; cyclical influences; manpower programs (Special Youth
Employment Training Program - SYETP); displacement effect of increased
married female labour force participation; possible influence exerted by
the growth in demand for part-time labour. Separate regression equations
were estimated for males and females for the period 1966-1978. Semi-annual
data were used.

15. We also note that Gregory and Duncan (1981) estimate the elasticity of
substitution between males and females to be 0.3 - an elasticity of the
same magnitude as estimated for the U.K. by Layard (1982).
Major problems were encountered in constructing a wage rate series. The wage rate data were only available on an annual basis. Thus, the amount of wage information used in the estimation is restricted. A further problem is that any interpolated wage rate series will be sensitive to the timing of award decisions. Marrilees attempts to circumvent these problems through use of a wage variable formed as a weighted function of wage data over a three year period. The use of this variable implies long lags in employment adjustment, contrary to the overseas evidence.

Marrilees' results appear to be reasonably plausible. For example, the immediate effect of an increase in the adult male unemployment rate is to lower the teenage/adult employment ratio [see also Layard (1982) for U.K. evidence]. For males, the SVEMP variable implies that SVEMP trainees are substituted for other (non-SVEMP eligible) teenagers as well as for adults. For females, the evidence suggests the SVEMP scheme has been associated with the direct substitution of SVEMP trainees for adult females. There is no statistical evidence that the increased participation of married women had an adverse effect on teenage employment.

The results also support the notion that higher wages are associated with reduced employment levels. Most of the teenage male own wage elasticities are around -1.8, and for teenage females the own wage elasticities are around -1.5. Overseas research has produced a range of own wage elasticity estimates, though Haimann and Grant (1979) feel that the most probable value exceeds -1.8 [see Section III (b)]. On the basis of this comparison, Marrilees' wage elasticity estimates may appear quite acceptable. It must be remembered, however, that Marrilees' estimating equation is a relative employment equation, and thus has a relatively weak theoretical basis [Haimann (1981)]. This, together with shortcomings associated with the wage rate data, imply that Marrilees' results be regarded as highly suggestive, but by no means conclusive.
Gregory and Duncan (1986) examine the labour supply behaviour of teenage males and teenage females. The wage effects established are, however, very sensitive to the specification of the participation rate equation. Thus, in equations which exclude a variable reflecting the importance of teenage part-time jobs, the wage variables reduce the labour force participation of both males and females. The elasticities are of the order of -1.0. When the part-time employment variable is included in the estimating equation the wage variable is not statistically significant for males. For females, the coefficient is statistically significant, thought only some 40 per cent of its magnitude in the restricted specification.

The study by Blundy (1979) is partly descriptive, partly statistical. Thus, he states that the recent increase in youth unemployment levels, coming as a "surge" after mid-1974, cannot be attributed to demographic changes. Demographic changes do not occur suddenly as is required to explain the deterioration in the youth labour market in the mid-1970's, and the timing (of the entry into the labour market of the post-war baby boom) is a decade too late. Statistically, Blundy examines the contribution to unemployment of the following factors: cyclical factors; relative labour costs; unemployment benefits; industry mix changes; part-time employment; population structure. Of these, cyclical factors, relative labour costs and unemployment benefits are reported as having important adverse effects on youth. It is suggested that a 1 per cent reduction in teenage labour costs is associated with a 1 percentage point reduction in teenage unemployment. Although disquiet is expressed in a number of instances [eg: use of male minimum wages as a proxy for teenage average wages], and the results are confessed to be "preliminary", no revised estimates appear to have been forthcoming.

16. Defined as part-time employment of teenagers divided by the teenage population.
IV THE RELATIONSHIP BETWEEN AVERAGE WAGES AND MINIMUM WAGES

What effect does a change in the minimum wage/award have on other wages in the economy?

The answer to this question is fundamental to the applicability of the overseas minimum wage evidence to the Australian youth unemployment problem.

Consider the Australian experience as revealed by a comparison of movements in the average hourly earnings series with changes in minimum award rates. This comparison allows one to determine whether institutionally determined wages 'push-up' the whole wage structure, or conversely, the institutionally determined wage is simply absorbed into earnings via a narrowing of the gap between award rates of pay and average earnings. Since the equal pay decisions of 1969 and 1972 changed the ratio of female average minimum award rates to male average minimum award rates from 0.71 in 1968 to 0.933 in 1977, a concentration on females will permit a particularly strong test of the earnings absorption hypothesis.

Examination of the data reveals [Gregory and Duncan (1981)] that the average hourly earnings and minimum award rate series appear to move in tandem: a finding consistent with the view that relative awards determine relative earnings in the Australian labour market.

How does this compare with the overseas evidence? An initial insight into this matter can be gained from the minimum wage variable employed in the majority of studies, the Kaitz index. Abstracting from the various weighting factors usually incorporated, this may be expressed as the ratio of minimum wage to average wage levels. Overseas research methodology implies, therefore, that the growth in minimum wages will diverge from that of average wages. The Australian evidence would suggest that the two growth paths would be similar, and therefore that the minimum wage measure would exhibit little variability. Further evidence relating to this matter must
rely upon U.S. research. The general conclusion drawn from this research is that the wage-fixing bodies can alter the wage distribution.

Granich (1976) examines two important avenues of influence. First, what impact does a higher minimum wage have on low wages? He finds that a substantial number of low-wage earners receive less than the minimum wage, a finding he attributes to two factors: substantial noncompliance and incomplete coverage. Second, what impact does a minimum wage have on higher wages? Higher wages might increase because of substitution effects. Alternatively, they might increase simply as a result of the desire by workers to maintain a given set of wage relativities. Granich estimates a Phillips curve-type relationship for private non-agricultural hourly wages, and includes minimum wages as an explanatory variable. A small current period impact (but no follow-on effects of lagged values of the minimum wage) was established. This implies that, contrary to the Australian experience, minimum wages have a substantial impact on the relative wage structure.

Similar conclusions are drawn by Meyer and Wise (1982) for the youth labour market. They draw attention to the difficulty of distinguishing shifts in the wage distribution due to the minimum wage from shifts due to other factors such as cohort effects. Nevertheless, they conclude "The weight of the evidence, however, does not point to a general increase in all youth wage rates with increases in the minimum".

Ragan, however, presents evidence of a link between minimum and average wages. As a suitable youth wage series was not available, Ragan constructs a 'proxy' youth wage series, this being based on movements in average wages in youth intensive sectors of the economy. The elasticity of average youth wages with respect to minimum wages ranged from 0.016 to 0.5, though typically it was of the order of 0.02 - 0.03. Ragan agrees that this is a small impact. Critics, however, are not even prepared to grant him this
small impact. For example, Rosen (1981) suggests that Regan's method of constructing the wage series results in a "built in positive bias."

It appears reasonable, therefore, to conclude that the overseas experience is one where changes in the minimum do not flow over, to any significant degree, to other wages in the economy. Wage fixing bodies thus have the potential to alter the wage distribution. This contrasts with the Australian experience outlined earlier.

Thus, when minimum wages are altered in the United States the wages of only a small segment of the workforce are affected. Hence the distinction between minimum wage and own-wage elasticities is stressed throughout this presentation. The latter wage elasticity is relevant when wages of all workers are altered. When minimum wages/wards are altered in Australia, however, the whole wage distribution shifts; thus the own-wage elasticity concept is applicable. This suggest, therefore, that when applying overseas evidence to Australian labour market problems, greater emphasis should be placed on the estimates of own-wage elasticities than on minimum wage elasticity estimates. As evident from our review of the Overseas empirical research this has important implications for the magnitude of the effects on youth labour force status that one might expect from government policy directed at altering wage levels.

V CONCLUSION

In recent years there has been a proliferation of studies examining the effects of changes in labour costs on the teenage labour market. These studies have addressed a wide range of issues, including employment, unemployment and labour supply responses, changes in the distribution of the

17. Alternatively, the minimum wage elasticities could be weighted by the inverse of the proportion of low-wage teenagers (about 0.4) to correct for the dilution of the elasticity estimate by high-wage workers [see Grollick (1976)]. As evident from the discussion above, such 'adjusted' elasticities would still provide an underestimate of the own-wage elasticity of employment demand for low-wage workers.
workforce across industries and between full and part time jobs, changes in the income distribution, changes in schooling behaviour and effects upon the acquisition of on-the-job training. Our discussion of the empirical evidence presented has been rather cautious. But this is not without good reason. There appears to be a wide gap between theoretical and applied research, with the theoretical developments in both economics and econometrics over the last decade having made relatively little impact on the methods employed in the studies reviewed [see also Brown, Gilroy and Kohen (1982)].

This shortcoming in the research methodology affects the reliability of the results. We hasten to add, however, that advances such as those of Hamermesh (1981) have tended to substantiate those findings of overseas studies which do not have a rigorous theoretical background.

However, there are a number of valuable lessons to be learned from our review. These lessons relate to both empirical results and the appropriateness of research methodology.

* The evidence on the direction of effects of changing labour costs is probably not open to dispute: higher labour costs lower employment and increase unemployment. However, obtaining precise magnitudes of these effects is rather difficult.

* The evidence on wage elasticities reported in the large number of recent overseas studies examining the effects of minimum wages is not directly relevant to the Australian teenage labour market.

* Perhaps the most important finding is that the own-wage elasticity of teenage employment demand exceeds unity. The studies examining substitution possibilities among different categories of labour have, in general, a stronger link with economic theory than the minimum wage studies. These estimates, therefore, may be a more useful guide as to
probable teenage labour market reactions to changes in labour costs. They imply, for example, that a five per cent cut in teenage wages would be associated with an increase in teenage employment of around 32,000 persons, and would be associated with a reduction in the unemployment rate of 4 percentage points.13

* The focus of recent overseas studies on employment equations rather than on unemployment equations appears to be a development Australian researchers can take cognizance of.

* Changes in wage rates are not an efficacious policy for altering the distribution of incomes.

In brief, the available empirical evidence confirm the predictions of economic theory: increases in wage rates for a category of labour reduce employment of that group and are also associated with an increase in unemployment. They are an inappropriate device for altering the income distribution.

13. Employment effect calculated as five times elasticity of -1.8; unemployment rate effect calculated assuming inelastic teenage labour supply.
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