

# MINIMUM WAGES AND THE FALLACY OF THE INFLATED DENOMINATOR

by  
MATTHEW JAMES\*, MARK WOODEN\* AND PETER DAWKINS\*

## 1. Introduction

The relationship between minimum wages and employment remains a controversial topic. This controversy intensified in the 1990s with the publication of a number of studies that questioned the dominant view that increases in the US minimum wage necessarily costs jobs. These studies resulted in the publication of the book, *Myth and Measurement*, by David Card and Alan Krueger.

Card and Krueger's results have affected the debate in countries where minimum wages are much higher (as a proportion of median earnings) than in the US. This has occurred despite the fact that Card and Krueger (1995, p. 393) have argued that their results only apply to the moderate range of minimum wages that has existed in the US in recent decades.

This paper does not provide an overview or assessment of the recent literature on minimum wages and employment. Rather, it focuses on a common misunderstanding that distorts much of the debate both in Australia and other countries. Brown (1988) has described this misunderstanding as the "fallacy of the inflated denominator".

This article first outlines the fallacy before illustrating its impact on the debate surrounding the setting of award wage rates in Australia. The article concludes with some comments on what evidence policy makers should consider in the setting of award wage rates in Australia.

## 2. Background

The majority of minimum wage studies are based on time-series data and estimate an equation of the following form:

$$\frac{E}{P} = F(M_w, D, Z)$$

The dependent variable ( $E/P$ ) is the employment-to-population ratio for a particular demographic group,  $M_w$  is a measure of the minimum wage (usually expressed as a proportion of the average wage for the particular group in question),  $D$  is a variable designed to account for changes in the

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\* Commonwealth Department of Employment, Workplace Relations and Small Business and the University of Melbourne (Mark Woden and Peter Dawkins) respectively. The views expressed in this paper do not necessarily reflect the views of either the Government or the Department of Employment, Workplace Relations and Small Business.

level of demand and  $Z$  is vector representing a range of other explanatory variables.

The majority of studies focus on teenagers. Thus the dependent variable in these studies is the employment-to-population ratio for all teenagers. As most teenagers earn substantially more than the minimum wage and do not see their wages rise as a result of an increase in that wage, it is not surprising that most studies find that rises in minimum wages only have a small impact on total teenage employment. For example, in their much quoted summary of US research, Brown, Gilroy and Kohen (1982, p. 524) concluded that:

Time series studies typically find that a 10 per cent increase in the minimum wage reduces teenage employment by one to three per cent.

This, however, does not mean that the demand for teenage labour has an elasticity of between just  $-0.1$  and  $-0.3$ . These results refer to the impact of a 10% increase in the minimum wage on total teenage employment *including* employees whose wages are not affected by increases in the minimum wage. Thus, an explanation for the small estimated employment impact from minimum wage increases lies in what Brown (1988, p. 144) has labelled the “fallacy of the inflated denominator”:

Part of this small effect is due to the fallacy of the inflated denominator: with incomplete coverage and the fact that most workers in nearly any demographic group earn more than the minimum wage, the effect on any such group’s employment will be smaller (in proportional terms), than it would be if impacts on those directly affected could be isolated.

This point has been made even more forcefully by Neumark and Wascher (1997, p. 4):

The logic underlying the conclusion that minimum wages substantially redistribute income towards low-wage workers — based on existing estimates of the employment effects of minimum wages — is flawed for two reasons. *First, the  $-0.1$  to  $-0.2$  elasticities used to reach this conclusion are taken from studies of the employment effects of minimum wages for entire age groups and are not equivalent to — as some have asserted — the elasticity of demand for minimum wage workers [emphasis added].* An estimate of the effect of a minimum wage increase on total employment in any particular age group is really the effect on the low-wage individuals in the group for whom the new minimum wage raises wages, averaged over all workers in this age category; as high-wage workers are for the most part unaffected by changes in the minimum wage, the aggregate elasticity will understate the employment effect on low-wage workers.

Similar points have been made by Gramlich (1976, pp. 430-431) and, more recently, by Addison and Blackburn (1999, p. 394).

Unfortunately, when reporting results from minimum wage studies many commentators fail to grasp this point. Freeman (1996, pp. 641-642), for example, in an otherwise considered analysis of the distributional issues surrounding minimum wages, concluded that “the elasticity of labour demand for minimum wage workers hovers around zero”.

The common misinterpretation of the minimum-wage literature outlined in this paper has serious policy implications as it can lead to a gross underestimate of the impact of minimum wages on the employment of those whose wages will be affected by such an increase.

The next section of the paper provides a discussion of how the common misunderstanding of the minimum wage literature outlined above has affected the debate surrounding award wages and employment in Australia.

### 3. The Australian Debate

Following the election of the Coalition Government in 1996, there has been an extensive debate in Australia about the relationship between award wages and employment. In that year, the ACTU announced its so-called "living wage" claim which seeks large increases in award wage rates. This claim followed the substantial falls in real award rates (that were partly designed to increase employment) that occurred under the Accord between the ACTU and the previous Labor Government. While the Australian Industrial Relations Commission has not granted any of the ACTU's "living wage" claims in full, it has granted substantial increases in award rates at the bottom of the award classification structure.

In making its case for large real increases in award wage rates, the ACTU has relied heavily on the international literature on the relationship between minimum wages and employment. Specifically, the ACTU draws on this literature in support of its contention that its claims, if granted, would have little, if any, adverse impact on employment. The Commonwealth and Coalition State Governments (the Joint Governments) have strongly opposed the large increases in award wages sought by the ACTU since 1996 and the arguments has used to support its claims.

Rather than review the debate between the Joint Governments and the ACTU in recent Safety Net Reviews, we have chosen to focus on two pieces of evidence cited heavily by the ACTU: a paper by John Nevile and the *1998 OECD Employment Outlook*. We also provide comments on a more recent paper by Nevile.

#### *Nevile's 1999 Paper*

In the 1999-2000 Safety Net Review the ACTU distributed and quoted approvingly from a conference paper by Nevile. This paper was a critique of the recent proposal by five prominent Australian economists ("the five economists") to freeze award wages to generate employment opportunities for low skilled workers, while increasing the value of transfer payments.

In his paper Nevile confused the employment effects of minimum wages on employment with wage elasticities in criticising a study by Debelle and Vickery (1998), which formed the basis of many of the assumptions made by the "five economists". Debelle and Vickery estimated the constant

output own wage elasticity for all Australian employees as being equal to  $-0.4$ .<sup>1</sup> Nevile (1999, p. 6) responded to Debelle and Vickery's results by arguing that their measured elasticity was larger than that found in most other studies and that the consensus from evidence at the micro level is that the elasticity of labour demand is close to zero (see Nevile 1999, p. 10).

The key point of interest for this paper is how Nevile reached this invalid conclusion. To investigate this we have looked closely at all of the references he used to support his claim.

The first piece of evidence cited by Nevile is the 1982 paper by Brown, Gilroy and Kohen (cited above). On the basis of this paper Nevile (1999, p. 7) concluded that:

Time series studies done before 1982 typically found an elasticity of demand for the labour of teenagers about half the elasticity for all workers found by Debelle and Vickery. This ratio of a half understates the difference since the elasticity for older workers was found to be lower, not higher, than that for teenagers.

This comparison with Debelle and Vickery's results is spurious given that Brown, Gilroy and Kohen were referring to studies that investigated the impact of minimum wages on *all* teenagers and young adults. As stressed above, Brown, Gilroy and Kohen's results are not estimates of the elasticity of labour demand.

Nevile made similar spurious comparisons of Debelle and Vickery's results with results from Swidinsky (1980), Solon (1985), Kaufman (1989), Bazen and Martin (1991) and Neumark and Wascher (1992). All of these studies focused on the impact of minimum wages on either total teenage or total adult employment. Contrary to Nevile's claims, none of the studies suggest that the elasticity of labour demand is close to zero.

Nevile's citation of Kaufman's results for the United Kingdom illustrates the need for care when reporting the results of minimum wage studies. In his paper Kaufman first generated estimates of the elasticity of substitution for male and female employees for the industries that used to be covered by the now disbanded wage boards and wage councils. Kaufman (1989, p. 1047) reached the following conclusion:

Given partial elasticities of substitution ranging between 0.45 and 0.85, I obtain estimates of between  $-0.55$  and  $-0.29$  for the average constant output elasticity of labour demand for men and between  $-0.64$  and  $-0.34$  for women.

Debelle and Vickery's estimates were well within both of these ranges. Thus there is no valid basis upon which to use Kaufman's results to question Debelle and Vickery's findings. Indeed, Kaufman's estimates of the

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1. This is actually an estimate of the elasticity of substitution. However, both Nevile and Debelle and Vickery appear to interpret it as an estimate of the constant output own wage elasticity. In the discussion that follows we accept Nevile's interpretation of the estimate to assess the validity of his claims.

elasticity of substitution (which Debelle and Vickery's estimate actually is) are higher than Debelle and Vickery's.

Kaufman (1989, p. 1048) went on to generate estimates of the total wage elasticity (that is including scale effects) of between  $-1.43$  to  $-0.56$  for men and between  $-1.26$  to  $-0.53$  for women.

Kaufman then used these estimates to test the sensitivity of total employment in these industries to changes in minimum wage rates. To do so he first estimated the extent to which the statutory minimum wage rate for men and women affected average wages in these industries. He found that minimum wages had no statistically significant impact on average male wages in these industries and, therefore, had no significant impact on male employment. However, Kaufman (1989, p. 1051) found that minimum wage rates had a small adverse impact on total employment for females.

Kaufman's paper provides a good example of the key proposition under examination here. While he found that minimum wages had a relatively small impact on total employment, this result was not reflective of very low measured wage elasticities (as Nevile implies). This result merely reflected the fact that minimum wages had a very small impact on *average* wages in these industries.

Similar points can be made about Nevile's citation of a study by Bazen and Martin (1991), which found that the French minimum wage had a small adverse impact on the employment of young people and virtually no effect for adults. Bazen and Martin first generated separate estimates of the elasticity of substitution for young people and adults. The authors then presented estimates of the constant output own wage elasticity (based on their estimates of the elasticity of substitution). These estimates ranged from  $-0.171$  to  $-0.261$  for adults and from  $-0.409$  to  $-0.625$  for young people (Bazen and Martin, 1991, p. 214).

These estimates are again broadly consistent with those obtained by Debelle and Vickery. While the estimates for adults are not as strong as those obtained by Debelle and Vickery, the results for youths are stronger.

Bazen and Martin (1991, p. 213) found estimates of the elasticity of substitution of  $0.44$  from their equation for youth and  $0.68$  from their equation for adults. Both of these estimates are larger than Debelle and Vickery's and are, therefore, suggestive of a stronger, not weaker, inverse relationship between wages and employment.

It is true that Bazen and Martin found that changes in minimum wages had virtually no impact on total adult employment in France. However, this is not surprising given that Bazen and Martin (1991, p. 211) also found that changes in the minimum wage had a small and statistically insignificant long-run impact on average adult wage rates.

Nevile (1999, pp. 8-9) also quotes Card and Krueger's well-known findings and provides a dated account of the debate that they have generated. While Card and Krueger's results will not be discussed here in

detail. they have come under challenge from an increasing number of studies.<sup>2</sup> Whatever one's views about the robustness of their findings, they do not support Neville's argument that the elasticity of demand is close to zero. Indeed, Card and Krueger have not argued that there is little or no relationship between real wages and employment. This is reflected in the cautious position they adopt with respect to moving the US minimum wage too high in the wage distribution (Card and Krueger, 1995, pp. 394-395). This position is consistent with the monopsony models that they have used to explain their results. Under monopsony, rises in the minimum wage can actually lead to an increase in employment up to a point. Beyond this "tipping point", however, the traditional results are observed.

Neville's final use of the minimum wage literature to question DeBelle and Vickery's findings was his citation of the results of a 1996 survey. According to Neville (1999, p. 13):

An American 1996 survey of labour economists found a median value for the elasticity of demand for the labour of low-wage workers of  $-0.1$  (Bernstein, 1999). For better-skilled, better-paid workers, the figure would presumably be even closer to zero. For all workers a figure between  $-0.1$  and zero may be as close as one can get to a professional consensus.

The original source for this survey (Fuchs *et al.*, 1998, p. 1417) reveals that respondents were asked to specify "the percentage change in employment of teenagers caused by a 10% increase in the minimum wage". In other words, the survey asked respondents to provide their best estimate of the impact of the minimum wage on total teenage employment, not an estimate of elasticity of labour demand.

In the same survey economists were also asked to provide their best estimates of both the "total wage elasticity of labor demand" and the "output-constant elasticity of labor demand". The average estimate of the constant output elasticity of labour demand was  $-0.42$  while the median estimate was  $-0.3$  (see Fuchs *et al.* 1998, p. 1392). In addition the average estimate for the total elasticity of labour demand was  $-0.63$  while the median estimate was  $-0.50$  (see Fuchs *et al.* 1998, p. 1392). Thus the survey upon which Neville relies, refutes his claim that a figure of between  $-0.1$  and zero may be as close as one can get to a professional consensus about the magnitude of the elasticity of labour demand.

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2. A number of commentators have argued that Card and Krueger's "natural experiments" failed to capture the longer run impact of minimum wages on employment. The importance of this has been demonstrated empirically by Bazen and Marimoutou (1997), Baker (1999), Partridge and Partridge (1999), and Burkhauser, Couch and Wittenburg (2000). Bellante and Picone (1999) have also questioned the validity of Card and Krueger's natural experiments by extending their comparison of New Jersey and Pennsylvania to include New York. Burkhauser, Couch and Wittenburg (2000) have analysed the results of Krueger's pooled, cross-State regression analysis and shown that their finding of no relationship between minimum wages and employment is a function of their inclusion of year specific dummy variables.

### *Nevile's Recent Paper*

An abridged version of Nevile's 1999 conference paper was published in the June 2001 issue of *Economic Papers*. In this paper Nevile (2001) continues to confuse the results of minimum wage studies with estimates of the elasticity of labour demand. However, he also attempts to respond to the type of criticism made in this paper by arguing that the issue of the "inflated denominator" is not very significant. His first defence is to argue that:

Teenagers who are receiving more than the minimum wage are still likely to receive low wages and it is likely that their wages will also rise to preserve a margin above the minimum wage.

Nevile provides no evidence to support this claim. In fact, the evidence actually suggests that the sort of ripple effect he discusses is fairly limited (Fernie and Metcalf, 1996, pp. 12-13; Card and Krueger, 1995, p. 166). In addition, if the ripple effect was very large (which Nevile implies) then minimum wages would have little, if any, effect on relative wages and the earnings distribution, contrary to the evidence (see OECD, 1998, p. 49). Further, if the ripple effect is as strong as Nevile believes, then it is hard to understand his apparent strong support for the award system in obtaining distributional outcomes.

Nevile also appears to imply that wages for teenagers are very closely clustered around the minimum. However, unpublished data show that, in the third quarter of 1999, only 14.9% of all US teenagers were paid at or below the prevailing minimum wage of \$5.15 per hour. In addition, 60% had hourly earnings of \$6.00 or more while 32% had hourly earnings of \$7.00 per hour or more.

Nevile (2001) also claims that there is no pattern for studies "using an inflated denominator to estimate lower elasticities than those which avoid it". It is hard to know how Nevile reached this conclusion, particularly when some of the papers he cited in his conference paper (e.g., Kaufman, 1989; and Bazen and Martin, 1991) are at odds with the logic underlying his claims. As the Joint Governments (1998, 1999, 2000) have shown, many of the limited number of studies that have focused on employees who are directly affected by increases in minimum wages have shown stronger results than studies that focus on entire demographic groups. The OECD (1998, p. 45) has also concluded that longitudinal studies which look at the impact on employees actually affected by rises in minimum wages provide stronger evidence of adverse employment effects than the aggregate studies.

Nevile (2001) also argues that the whole issue of the inflated denominator is not relevant where minimum wages are shown to have a zero or positive impact on total employment. This is again incorrect. If a study finds that the impact of rises in minimum wages on employment is not significantly different from zero, this may simply reflect the fact that a very small proportion of the group in question are affected by rises in minimum wages. This point particularly applies to studies that investigate

the impact of changes in minimum wages on total employment for adults and young adults.<sup>3</sup> In addition the vast majority of minimum wage studies continue to suggest that rises in minimum wages have had a negative impact on total teenage employment (see Joint Governments 1998, 1999, 2000).

### *Other Examples*

In fairness to Nevile, he is not alone in failing to recognise the difference between the elasticity of labour demand in the impact of increases in minimum wages on employment. He is in good company. Indeed a number of examples of this misunderstanding can be found in the international literature.<sup>4</sup>

Other examples can also be found in the Australian debate. In a 1994 speech recently cited by Junankar (2000), Bob Gregory (1994, pp. 109-110) arguably Australia's most respected labour economist, also appears to have confused the results of minimum wage studies with the elasticity of labour demand. For example, Gregory (1994, p. 109) suggested that Neumark and Wascher had obtained an estimate of the elasticity of labour demand of between  $-0.1$  and  $-0.2$ . The result referred to by Gregory was an estimate of the impact of increases in the US minimum wage on total teenage employment, not an estimate of the elasticity of labour demand.

Gregory (1994, p. 109) also noted that:

There is an older econometric literature which suggests that the elasticity might be 0.3. That is, to increase employment by 10 per cent wages would need to decline by 33 per cent.

A close look at the speech suggests that this is likely to be a reference to Brown, Gilroy and Kohen's well-known summary.

### *The 1998 OECD Employment Outlook*

One of the main pieces of evidence that has been discussed in recent Safety Net Reviews is the 1998 *OECD Employment Outlook*. The Employment Outlook for that year reported the results of a number of cross-country time series regressions.

The dependent variable in these regressions was the employment-to-population ratio for various demographic groups. The OECD found a significant coefficient on the minimum wage variable in the equations for teenagers. For young adults most results suggested that the coefficient on the minimum wage variable was close to zero, while for adults the effect was always insignificant.

As the dependent variable in the regression for adults was the

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3. Unpublished data from the US Current Population Survey show that in the third quarter of 1999 only 6.6% of all 20-24 year olds were paid at or below the prevailing US minimum wage.

4. See Neumark and Wascher (1997, pp. 2-5) and Addison and Blackburn (1999, p. 394).

employment-to-population ratio for all adults, it is not surprising that no significant impact from minimum wages was found given that, across all of the OECD countries included in the regressions, only a very small proportion of adult employees are paid at the minimum wage. The OECD's findings thus do not imply that minimum wages have no impact on the employment of those who are affected by that minimum wage nor do they imply that the elasticity of demand for these workers is very low.

#### **4. What Should Policy Makers Focus On When Adjusting Award Wage Rates?**

Most minimum wage studies analyse the impact of minimum wages on total employment for particular groups and are obviously relevant if you want to know how minimum wages affect overall outcomes. The results of these studies suggest that in most OECD countries minimum wages only have a relatively minor impact on aggregate outcomes. This, however, may not be the case for Australia given the relatively high proportion of employees who are paid at award wage rates. The key question for policy makers regarding minimum wages, however, is not their aggregate impact but their impact on those who will actually be affected by that wage.

If the total elasticity of labour demand for minimum wage workers is greater than  $-1$ , then a real increase in the minimum wage will make those workers, as a group, worse off. It would be untenable, in these circumstances, to support such an increase on the grounds that it would have little impact on aggregate outcomes when such an increase would have an adverse impact on the group it is designed to assist.

To focus on the impact of increases in minimum wages, policy makers need to have some idea of the elasticity of labour demand for the group of workers who will be affected by such increases. Without such an estimate it is not possible to adequately compare the potential costs with the potential benefits. Most minimum wage studies do not provide the required information.

It is, however, possible to make the results of minimum wage studies more comparable with wage elasticities by weighing up the estimated employment impact of a minimum wage by the inverse of the proportion of employees who are actually affected by an increase in that minimum wage. Thus, if a minimum wage study found that a 10% rise in the minimum wage leads to a 2% fall in teenage employment and 20% of teenagers are actually affected by that increase, then the elasticity for teenagers affected by the increase would be  $-1$  ( $-0.2 \times (1/0.2)$ ).

However, as Gramlich (1976, p. 432) argues this adjustment is not enough as it fails to account for the fact that rises in minimum wages may lead to a substitution in favour of higher paid workers at the expense of workers paid at the minimum wage. Such a substitution would not be reflected in a minimum wage study that looked at the impact of the minimum wage on an entire demographic group.

A further adjustment is required to take account of the fact that a proportion of employees who benefit from increases in minimum wages do not receive the full increase (Neumark and Wascher, 1997, p. 5).

Thus, if the results of minimum wage studies are to be compared with labour demand elasticities then each of the adjustments outlined above need to be made. It is worth noting, in this context, that Neumark and Wascher (1997, p. 5) have shown that, in the United States, an estimated employment impact of a minimum wage increase as low as  $-0.1$  could be associated with a demand elasticity for employees actually affected by increases in the minimum wage of  $-0.92$ .<sup>5</sup>

## 5. What Evidence Should We Rely on for Australia?

There have only been two attempts (that we know of) to conduct a "minimum" wage study using Australian data. However, these studies reveal more about the difficulty of conducting this type of study in Australia than they do about the elasticity of labour demand (see Joint Governments, 1999, pp. 144-149).

There is little to be gained from using the results of minimum wage studies conducted in other OECD countries to inform the Australian debate particularly if the adjustments outlined above are not made. However, even if all of the adjustments outlined above are made, the relevance of any resulting estimates to Australia is still questionable.

Employees paid at minimum wage rates in other OECD countries tend to be concentrated at the very bottom of the wage distribution while employees paid at an award rate in Australia are more evenly spread through the distribution. In addition, if the explanations (based on monopsony models) used by Card and Krueger are taken seriously, then wage elasticities for minimum wage workers in OECD countries with relatively low minimum wages may be considerably smaller than the equivalent elasticity for employees paid at award rates.<sup>6</sup> After all the Federal Minimum Wage is one of the highest among OECD countries.<sup>7</sup>

## 6. Conclusion

There has been a large degree of confusion in the Australian debate on the relationship between minimum wages and employment. This

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5. It is also worth noting that most minimum wage studies focus on the impact of the minimum wage on employment rather than hours worked. As a result they will not reflect reductions in working hours among employees paid at the minimum wage.

6. If employees paid at minimum wages are paid less than the value of their marginal product (which can occur under monopsony models), then the measured wage elasticity for these workers (over a range) may be positive or slightly positive. In a country with a considerably higher minimum wage the probability of employees being "exploited" in this way would, other things being equal, be less, and as a result monopsony models would be less relevant.

7. See joint Governments (2000, Chapter 7) for data on the relative level at which minimum wages are set across the OECD.

confusion culminated in Nevile's recent claim that the elasticity of labour demand is close to zero. If this mistaken claim is taken seriously, it could lead to very poor policy conclusions.

While there may be grounds for supporting real increases in minimum wages despite the fact that these increases cost jobs, there is nothing to be gained by understating the extent to which this occurs.

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# DISTORTING THE AUSTRALIAN WAGE DEBATE: A REPLY TO JAMES, WOODEN AND DAWKINS

by  
J.W. NEVILE\*

James, Wooden and Dawkins (henceforth JWD) argue that the “fallacy of the inflated denominator” has distorted the debate, in Australia and other countries, on the relationship between minimum wage rates and employment. They illustrate the use of this “fallacy” by criticising two papers of mine, or rather two versions of the same paper, a conference paper and a revised and abridged version of this conference paper published in the June 2001 issue of *Economic Papers*. This note briefly comments on their criticisms of my work and then puts the controversy between us into perspective. To keep this response to a reasonable length it focuses on the major points raised by JWD.

In replying to the criticisms of JWD I will concentrate on the *Economic Papers* version, which is readily available to readers of this journal. However, I acknowledge that the original conference paper did not address the issue of the inflated denominator. In the context of a discussion of the proposal of the five economists to freeze award wage rates the question of the inflated denominator is, in my view, of no importance. Nevertheless, some respected economists think it is and ignoring it was obviously a mistake.

JWD state:

As most teenagers earn substantially more than the minimum wage and do not see their wage rise as a result of an increase in that wage, it is not surprising that most studies find that rises in minimum wages only have a small impact on total teenage employment.

This is the crux of their arguments: that low elasticities of total teenage employment with respect to changes in the minimum wage are due to the supposed fact that the wages received by most teenagers do not change when the minimum wage changes. This supposed fact runs counter to much research. In a *Journal of Economic Literature* survey article Ryan (2001) points out that the employment effects of a minimum wage depend on a chain with two links: the first is the effect on a change in minimum wages on wage rates received or pay and the second the effect of the changes in these wage rates on employment. He then states “For youth the first link holds: changes in minimum wages affect youth pay, ... The second link is more fragile” (p. 62). Ryan defines youth as those under 25, whose

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\*University of New South Wales.

pay as a whole is likely to be higher than that of teenagers and therefore less affected by changes in the minimum wage. Thus, his summary of the conclusions of the literature on this matter would be even stronger if applied to teenagers alone.

In this context it is interesting to look at how high the average wage received by US teenagers is compared to the minimum wage. JWD quotes unpublished data to suggest the gap between the two is great. It is difficult to comment on unpublished data, especially when the source is not given. However, Dolado *et al.* (1996, p. 324) point out that the Kaitz index (of the minimum wage as a fraction of the average wage) was 0.85 for teenagers in the US and was "much higher" than in many European countries. Incidentally, this figure throws light on Card and Kreuger's (1995, p. 393) caution that their evidence is only relevant for the "moderate range of minimum wages" that prevailed in the US over the past few decades. (After all, this was the situation the data was drawn from.)

In any case, whether or not US teenagers overall received substantially more than the minimum wage, the conclusion that changes in the minimum wage affect the general wage rate received by teenagers stands. I am not claiming that the wages of all, or most, teenagers rise by as much as the minimum wage, but that on average they rise substantially: enough to reduce greatly the importance of the inflated denominator. Ryan (2001) gives two examples of the elasticity of youth earnings with respect to changes in the minimum wage: 0.6 for the Netherlands (p. 64) and 0.4 for France (P. 62).

JWD criticise my argument that, if the inflated denominator was of great importance, one would expect studies that clearly were not subject to it to have much greater (negative) elasticities than those that could be affected by it, but this was not the case. JWD ask what is the evidence for this lack of pattern. Surely, the prime example is Card and Kreuger (1995) type studies. Not only did they find positive or zero elasticities but similar studies by their opponents Neumark and Wascher (1995) found elasticities just as close to zero as these found in studies which could be subject to the inflated denominator.

My final point on the inflated denominator was that if the elasticity of demand is zero or positive the question of the size of the denominator is irrelevant. The logic of this statement is impeccable, but the implied implication may not be. JWD argue that if something reduces a parameter to a low figure it is more likely that a statistical study will find effects that are not significantly different from zero. I concede that this is so, assuming that whatever reduces the size of the parameter does not affect the size of the error terms. I regret that I phrased my original comment the way I did. Nevertheless, there is a matter of substance underlying my comment. Even if the elasticity of demand for teenage labour is two or three times as large as a figure between zero and 0.1, it is still close to zero.

JWD's final major point is that the majority of studies find that the elasticity of demand for teenage labour is negative. I have never suggested

otherwise and clearly state in my article that I believe the elasticity of demand for labour to be negative but very small.

It is noticeable that both JWD and myself have put most emphasis on teenage employment. This is partly because studies of teenagers predominate and partly because, for whatever reason, by and large studies of the consequences of changes in minimum wages on adult employment find no discernible effects. However, there are at least two reasons to think that the demand for teenage labour is more elastic than that for adult labour. First, a greater proportion of teenagers work in low paying, and presumably low skill jobs. In general, the elasticity of demand for low skilled workers is greater than that for highly skilled workers. Secondly, cutting minimum wage rates for teenagers may increase teenage employment at the expense of adult employment and the reverse when minimum wage rates are increased, increasing the elasticity of demand for teenage labour compared to that for adults.

The controversy between JWD and myself is explicitly in the context of what changes are appropriate to the level of award wage rates in Australia. My conference paper and the article in *Economic Papers* argue against the proposal of the five economists to freeze award wage rates. JWD pick on a relatively minor part of my argument and ignore my major criticism of the five economists case. This criticism highlights a flaw in their discussion which has far more potential to distort the Australian wage debate than any judgement about the importance of the inflated denominator. The empirical evidence that the five economists cite to support their recommendations comes from the DeBelle and Vickery (1998) model. As I pointed out in the work criticised by JWD, the major issue is not the elasticity of demand for labour, or the elasticity of substitution if output is held constant, but the size of the effect of a fall in real wages on the levels of output and employment corresponding to the NAIRU. DeBelle and Vickery do not attempt to estimate this. They make two assumptions: one at the top and one at the bottom of a range. The five economists take the results that depend on the assumption at the top of the range. They do not even mention the results that depend on the other assumption. In the open letter to the Prime Minister they state that "Based on DeBelle and Vickery's estimates this [freezing award wage rates for four years] should reduce unemployment by 1½ to 2 percentage points". I am not criticising DeBelle and Vickery who give results for assumptions at either end of a range and in effect undertake a sensitivity analysis. But the action of the five economists in using only the assumption at the top end of the range and implying that their forecast result of freezing award wage rates are based on empirical research has the potential to distort very seriously the debate about award wage rates in Australia. Whatever were their intentions, the action of JWD in focusing on a minor aspect of my argument against the evidence used by the five economists diverts attention from a major flaw in that evidence. This can only increase, not reduce the distortion of the wage debate in Australia.

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