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What Can Recent Labour Research Teach Us About Macroeconomics?

Andrew J. Oswald and Philip A. Trostel

a.j.oswald@warwick.ac.uk and p.a.trostel@warwick.ac.uk

Department of Economics
University of Warwick
Coventry CV4 7AL
Great Britain

Abstract

Labour economics has produced more empirical evidence than most areas of economics. This article summarizes six examples of regularities in labour-market data which seem relevant for understanding macroeconomics but may not be widely appreciated at present.

1. Unemployed people have dramatically low levels of mental well-being.
2. Rent-sharing seems prevalent: wages depend upon lagged profits-per-worker.
3. Areas with high unemployment have low wage rates. This wage curve has an elasticity of approximately -0.1.
4. Minimum-wage laws appear to have little effect on low-wage employment.
5. Individuals with more education have lower unemployment rates.
6. Nations' unemployment rates are positively correlated with home-ownership rates.

These pieces of evidence are difficult to reconcile within the standard perfectly-competitive spot-market model of labour markets. Taken together, they suggest it may be worthwhile for macroeconomic theory to move further away from this paradigm.

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1. Introduction

Perhaps more than any other subdiscipline, research in labour economics is empirical. The content of the most recent issue of the *Journal of Labor Economics* (JOLE) is indicative.¹ This issue has eight papers. Only one of these contains no empirical evidence. The other seven articles are primarily empirical: they employ data and report various kinds of regression equations. All seven use micro data, that is, information on individual units like randomly-sampled workers. Only one uses non-US data. Before presenting their empirical work, most of the papers construct a theoretical model that would be too technical to be understood by graduating economics majors. This issue of JOLE is representative of modern labour (or perhaps one should say labor) economics.² It is dominated by empirical reasoning and US-based evidence, but is not devoid of theory.

Some economists, such as Krugman (1998), think that labour economics is setting a trend that the rest of the profession will follow. Krugman notes that the last two Bates Clark Medal winners (bi-annual award to the top young US economist) have been empirical labour economists, David Card and Kevin Murphy. This, the argument goes, signals that economics is moving away from rewarding "home-run hitting" theoretical work to rewarding "careful, data-intensive research." Krugman argues that research in the style done in labour economics will come to dominate the whole subject. Some support for this conjecture is borne out by the recent

¹The JOLE is the leading field journal in labour economics and is influential within the profession generally. On the basis of impact-adjusted citations, JELit surveys rank it slightly above publications like the *Review of Economics and Statistics*, *Economic Journal*, and *International Economic Review*.

²Angrist and Krueger (1998) recently categorized articles in eight leading journals from 1994 to mid-1997 and found that 79% of the articles in labour economics examined empirical evidence (compared to 50% in non-labour fields). 83% of the empirical articles in labour economics examined micro data (compared to 27% in non-labour fields).

appointment of noted empirical economists, James Poterba and Roger Gordon, to the editorship of the *Journal of Public Economics*, the leading field journal in public economics (a field not previously known for its empirical nature).

Although emphasis on evidence may be increasing in the profession, that does not necessarily imply that empirical findings are having a greater influence on formal or informal thinking about the economy. Indeed, in the following selective survey we highlight some empirical findings about labour markets that seem to be relevant for macroeconomic theory, but, as yet, do not seem to have had much influence. This, however, is not meant as a general indictment of the lack of interaction between empirical evidence and macroeconomic theory. We simply note areas where more interaction between labour evidence and macro theory appears worthwhile.

There is always going to be some gestation lag between the production of evidence and its impact on theory -- especially when boundaries between sub-disciplines are being crossed. Indeed, as some empirical findings do not hold up over time, it is rational to wait until the amount of evidence is considerable before changing theories. But we suspect there is truth in the famous: "human beings never change their minds; they simply die, and that is how new ideas take over".

Perhaps surprisingly, few labour economists currently give a lot of thought to testing theories at a high level. They see their job more as measuring the sizes of parameters. Determining how much training raises wages, for instance, is viewed by most labour economists, rightly or wrongly, as a question for which one needs good data and a powerful methodological approach rather than a detailed theory. In this sense, many modern labour economists fit

Keynes's vision that one day economists would be practical and useful in the way that, he thought, plumbers are practical and useful. Some labour economists are suspicious of purely theoretical work. Perhaps for this reason, labour economics is also a branch of economics where the inductive method is used more than in most of economics: it is easy to publish measurement without theory. As in a great deal of science, there is labour research that assumes some theoretical framework is true and then makes empirical calculations on that presumption. Some labour economists are even beginning to wonder if the swing from theory has gone too far (Hamermesh, 1998). But generally, aside from the occasional anti-theory banter, in labour economics it is hard to discern any obvious methodological conflict between theorists and empiricists. The great bulk of labour research has an empirical flavour, but few labour economists would argue that the field can do without theoretical models.

Labour economists have not been entirely successful in their practical and useful endeavours to measure and publicize the sizes of parameters, however. For example, literally hundreds of studies have estimated the rate of return to education, yet there is still debate about its value (see, e.g., Psacharopoulos, 1994 and Card, 1995). Even in the case of the US, where the quantity and quality of analyses is generally the highest, we cannot safely rule out a rate of return which is more than ten percent (per year of schooling) or less than five percent. Moreover, there is some disagreement even among labour specialists about the robustness of findings.³ Thus, it may not be all that surprising that economic theorizing often seems to be ignorant of empirical evidence.

³For example, the evidence on the output-constant wage elasticity of labour demand is about as robust as it gets. After surveying the evidence, Hamermesh (1993) concluded that it was about -0.3. Fuchs, Krueger and Poterba (1998) surveyed 65 labour economists at 40 leading research universities in the US about the size of this and other parameters. The mean and median answers were very close to Hamermesh's figure, but the standard

Despite the obvious current limitations in trying to establish empirical regularities, we believe that there are things to be learned about the economy from recent empirical studies about labour markets. Our survey of recent findings about labour markets will be selective. Given that roughly three fourths of net national income is determined in labour markets, empirical evidence about labour markets should be relevant for macroeconomic theory. We confine our focus to findings about two related themes -- imperfect competition in labour markets and unemployment.

Six Empirical Regularities in Labour-Market Data

Involuntary Unemployment - Microeconomic and psychological research suggests that the unemployed have much lower levels of life satisfaction, happiness and mental health than those in work. This result holds in cross-sections and panels, and in all countries so far studied. It is consistent with the idea that unemployment is involuntary (in what we take to be a Keynesian tradition as opposed to a conventional neoclassical view).

Rent Sharing - The data show a positive microeconomic link between profits and pay. This result -- which conjures up images of bargaining -- suggests that the law of one price fails and that labour markets are not perfectly competitive.

Wages and Unemployment - The data seem to indicate a robust negative link between wages and the unemployment rate in the local area. This downward-sloping "wage-curve"⁴ appears to be inconsistent with the perfect-competition model of labour markets (if anything there should be a positive relationship -- as high wages should be associated with the demand

⁴Although the observed wage-unemployment locus may appear to a type of a labour supply curve, the evidence indicates that it is not

curve being the binding short side of the market). Simple Phillips-curve models also fail to predict a negative relation between the level of pay and the level of joblessness (though modern error-correction ones do not). The curve is consistent with imperfectly-competitive theories such as the efficiency-wage model. Shapiro and Stiglitz (1984) predict such a curve.

Minimum Wages and Unemployment - Recent research by Card and Krueger (1995) and others suggests that, at existing levels in the US, minimum wages do not raise unemployment rates. Indeed, if anything, minimum wages appear to slightly lower unemployment. This evidence is also contrary to the prediction in the standard competitive model of labour markets. The data suggest that firms, even those hiring in seemingly competitive labour markets, may have some monopsony control over wage rates.

Education and Unemployment - Numerous studies have documented a negative correlation between education attainment and unemployment. This (and other) evidence suggests that labour markets are characterized by firm-specific investments and long-term implicit contracts, as opposed to the standard spot-market model of labour markets.

Home Ownership and Unemployment - There is a positive correlation, across countries, between the extent of home ownership and the unemployment rate. One possible explanation is that lack of private renting in the housing market slows down labour mobility.

Using the terminology of Angrist and Krueger (1998), some of the empirical findings reviewed here might be classified under the category of "descriptive analysis", whereas modern empirical research in labour economics is more typically of the "casual inference" variety. This choice reflects our view that, at the current stage of development of data resources and econometric methods, the marginal value product of descriptive research is high. Regardless of

exact theoretical interpretation, patterns and trends in the data help to shape academic and non-academic economic thought.

2. Unhappiness and Unemployment

Unemployment is higher in Europe than America because Europe's labour markets are riddled with rigidities... and generous unemployment benefits. (The Economist, 11 October 1997)

The unemployment rate in OECD countries is now more than 10%. In nations like Spain, it is closer to 20%. Many governments, for theoretical rather than empirical reasons, think that this is something to do with high unemployment benefits.

Are large numbers of individuals contentedly choosing to be unemployed? If the answer is yes, the State might wish to reduce the attractiveness of being without work, and to allow those in jobs to keep a larger share of the tax revenue that at present goes to cross-subsidize the jobless. If the answer is no, the State may have to look elsewhere for ways to tackle unemployment, and perhaps consider methods of directly raising the number of jobs or getting people into work directly rather than reducing the number of benefit claimants.

As this seems the necessary starting question for an analysis of unemployment policy (as well as being a methodological difference between schools of macroeconomic thought), it might be thought that economics journals would be full of studies that attempt to evaluate the "voluntary-ness" of unemployment. Clark and Oswald (1994), however, point out that such studies are few. In principle, there is extensive survey data available to shed light on this issue. But economists have traditionally been hostile to these data for two reasons. Economists tend to be suspicious of subjective survey data. And economists are even more suspicious of the idea that subjective well-being, i.e., utility, can be measured. A different attitude is found among psychologists (who, paradoxically, might be thought better qualified than economists to judge

such things). Thousands of papers in the psychology literature are concerned with the statistical analysis of subjective well-being information.

Taking their lead from the psychologists, Clark and Oswald (1994) try to test for the voluntary-ness of unemployment using data on reported well-being. The test is to see if unemployed people are relatively happy or unhappy. It is based on the underlying idea that people do not voluntarily choose misery. But unemployment appears to be associated with a great deal of unhappiness (holding constant a person's qualifications and other characteristics), and therefore does not look voluntary.

Clark and Oswald use data from the first sweep of the new British Household Panel Study, which provides information about a random sample of approximately six thousand working Britons in 1991. Among other things, it contains mental well-being scores from a form of psychiatric evaluation known as the General Health Questionnaire (GHQ). These scores are used to assess people's feelings of subjective well-being. In its simplest form this assessment weights the answers to the following set of questions.

Have you recently:

1. been able to concentrate on whatever you are doing?*
2. lost much sleep over worry?
3. felt that you are playing a useful part in things?*
4. felt capable of making decisions about things?*
5. felt constantly under strain?
6. felt you couldn't overcome your difficulties?
7. been able to enjoy your normal day-to-day activities?*
8. been able to face up to your problems?*
9. been feeling unhappy and depressed?

10. been losing confidence in yourself?
11. been thinking of yourself as a worthless person?
12. been feeling reasonably happy all things considered?*

People's answers to these questions are coded on a four-point scale running from "disagree strongly" to "agree strongly". Starred items are coded in reverse, so that, for example, zero then corresponds to "agree strongly". These twelve are then combined into a total GHQ level of mental distress in which high numbers correspond to low feelings of well-being. The data provide a mental stress or, less accurately, "unhappiness" level for each individual in the sample.

There are various ways to work with GHQ responses. Clark and Oswald calculate so-called "Caseness scores". These are produced by taking people's answers to the twelve questions listed above and summing the number of times the person places himself or herself in either the fairly stressed or highly stressed category. With this method, the lowest possible level of well-being corresponds to a caseness level of 12 (meaning that the individual felt stressed on every one of the twelve questions). The highest level of well-being corresponds to 0 (meaning that the individual felt stressed on none of the twelve questions). Individuals with high caseness levels are viewed by psychologists as people who would benefit from psychiatric treatment. To make the paper's results easier to read, later statistics are described as measures of mental distress. More exactly, however, they are caseness levels.

The data in Table 1 seem to reveal evidence of involuntary, rather than voluntary, unemployment. Unemployed Britons in 1991 show high levels of mental distress. Using the scale just described, the mean level of distress is 2.98 for the jobless and 1.45 for employees (both measured on a scale from 0 to 12). The 522 jobless people in the sample had approximately twice the mean mental distress score of those 4893 individuals with jobs. The

difference here between the employed and unemployed is statistically significant with a t-statistic of over 10.

To understand the size of this effect, which is large, it is necessary to have some feel for the statistical distribution of the six thousand answers. In the full sample, taking all those classified as in the labour force, more than half of individuals report a mental distress score of zero. Thus zero is a very common level of recorded "unhappiness". Just under one thousand other individuals have a distress level of 1, and approximately five hundred have a distress level of 2. The great majority of Britons, therefore, show low degrees of GHQ distress. Moving through the remaining scores from 3 to 12, the numbers of individuals become gradually smaller. The mean difference of approximately one-and-a-half points on an unemployed person's distress level means that those without work appear to be substantially more distressed than people with jobs. Joblessness is apparently extremely unpleasant. Its effect on mental well-being exceeds everything else in the data except major illness. As Clark and Oswald note, the effect of unemployment is larger than the effect of divorce, for example.

The raw data also show (not reported) that mental distress is found disproportionately among women, among people in their thirties, and among those with high levels of education. For each sub-group, unemployed individuals report much lower well-being. A cross-tabulation by education makes a natural illustration. It is given in Table 2. This shows that distress from joblessness is, at 3.44, the greatest for those (86) people who are highly educated. Although it is impossible to be sure why this is, the result fits with economists' presumption that, because of the greater foregone wage, the opportunity cost of unemployment should be larger for the highly-educated.

The basic patterns found in the data are confirmed when more formal multivariate techniques are employed. Clark and Oswald report ordered-probit equations. The size of the unemployment coefficient continues to be large. It is economically, and not merely statistically, significant.

Within the last few years there has been an outpouring of work looking at psychological measures of well-being. Many countries are studied. Di Tella, MacCulloch and Oswald (1997), for example, estimate life-satisfaction equations for a dozen European countries and the United States. Table 3, based on US data, is indicative of one finding. The authors also show that, controlling for country fixed effects, unemployment movements significantly lower people's reported well-being scores. This effect holds in a country panel over and above the microeconomic correlation between simply being unemployed and low well-being. When the unemployment rate in a country rises, the life-satisfaction levels of employees fall. This suggests that the fear of unemployment affects people who are in work. Blanchflower and Freeman (1994) study well-being in a range of Western and transition nations, and also discover that unemployment is the most important economic correlate. Research described in Blanchflower, Oswald and Warr (1993) does the same for US data from the General Social Surveys.

As an illustration of recent findings, there is work for Germany, Sweden and Southern Ireland. Gerlach and Stephan (1996) and Winkelmann and Winkelmann (1998) provide evidence for the first country (using the German Socioeconomic Panel) that falling into unemployment produces a large drop in life satisfaction, and that this drop is much greater than can be explained by the decline in income. This is important, because panel evidence is intrinsically preferable to

cross-section results. For the second country, new work by Korpi (1997) suggests a strong link of the sort just discussed for other countries. Whelan (1992) finds in Irish data that unemployment is correlated with poor mental-health levels and high "financial strain" scores.

A puzzle to emerge here is why the market itself does not provide more insurance against the seemingly bad event of being jobless. Even in the US, what private unemployment insurance exists is sporadic (Oswald, 1986). This missing market seems an avenue worth exploration.

Obviously the "involuntary-ness" of unemployment is not the only possible explanation of the above empirical findings. In cross-section analyses by social scientists, lines of causality are often open to debate. The same is true in this case. If the unemployed appear to be less happy and to have poorer mental health than those in jobs, it could be that this is because such people are inherently less desirable as employees. In other words, psychological status might be the cause, rather than the effect, of joblessness. However, there is a great deal of longitudinal evidence, collected by psychologists for smaller samples and as explained earlier for economists' larger samples, that sheds doubt on such an interpretation. A summary of small psychological field experiments is provided by Warr, Jackson and Banks (1988).

It is also possible that the empirical correlation between unemployment and subjective well-being is simply due to ex post bad luck. That is, if unemployment is often the result of adverse shocks, then that may be the real cause of unhappiness rather than the involuntary-ness of unemployment. In other words: bad things happen; job search takes time; and people are going to be unhappy about it until the job search eventually offsets (perhaps only partially) the

bad event.⁵ There is obviously something to this sort of explanation. But there are two difficulties. First, it is not clear why the wage does not adjust immediately to clear the market. Second, we would be surprised if it could account for the extent of the observed correlation. If people are reasonably far-sighted, it seems unlikely adverse shocks should increase mental distress so dramatically. As usual, more research is needed to explore the issue.

3. Rent Sharing

The long-standing debate between competitive and non-competitive theories of wage determination (sometimes referred to, perhaps not accurately, as the Harvard-versus-Chicago debate) has recently been revived. Sumner Slichter (1950) first pointed out that similar people appear to be paid dramatically different amounts, and that the wage premia are highest in highly profitable industries. This evidence, he suggested, is consistent with non-competitive rent-sharing theories. Dickens and Katz (1987) and Krueger and Summers (1987, 1988) found that Slichter's patterns exist in modern data. These studies have revived the old debate and have sparked a great deal of recent research.

The recent work on rent-sharing draws upon information unavailable to those in the original debate, namely, microeconomic and especially longitudinal data on contracts, establishments, firms, and people. The new papers estimate versions of the simple wage equation:

⁵This seems to be the view expressed to us in correspondence with Martin Eichenbaum.

$$w = \bar{w} + \beta \pi/n,$$

where, the employer's equilibrium wage, w , is shaped by a mixture of outside wage opportunities, \bar{w} , and profit-per-employee, π/n (β is the relative bargaining power of workers).

It is straightforward to derive this equation from a bargaining model. Contrary to the prediction of the competitive wage-taking model, the new empirical studies find that profit-per-employee matters in wage determination. The studies have largely been produced in unknowing isolation from one another; they have only recently begun to appear in journals. These papers cover various countries and settings. Yet, intriguingly, the studies paint a consistent picture.

At the literature's heart is the following testable hypothesis. When an employer enjoys a sustained burst of profits, does that feed through into higher long-run pay for its employees? The new literature summarized in Table 4 suggests that, contrary to the wage-taking prediction of the competitive model, the answer is yes.⁶ This appears to be true in non-unionized as well as unionized settings. One reason why the finding is of broader interest than to labour economists is that it holds at the macro level. If a picture speaks a thousand words, then Figure 1 is enlightening. This figure, from Brosius (1998) using quarterly macro data in the UK from 1970 through 1997, illustrates just how closely detrended wages track (lagged) detrended profits per employee. Perhaps there are empirical grounds to apply bargaining models in more widespread circumstances than has been presumed.

⁶Nickell and Wadhvani (1990) is one of the few to fail to find an effect from profits in their wage equations. They do, however, obtain a positive effect from the closely related sales-per-employee.

It is sometimes claimed by European labour economists that the labour market is "obviously" non-competitive. This is more easily said than proved. Perhaps for this reason, such claims have left comparatively little impression. What seems to make the new literature more persuasive is the quality of its underlying data and methods. While no single study is free of flaws, weaknesses in one appear to be covered by strengths in another. Especially dramatic findings are produced when researchers correct for endogeneity with a sensible economic variable, for example: Abowd and Lemieux (1993) use import and export prices to instrument profitability; Van Reenen (1996) uses firms' earlier technical innovations; Teal (1996) uses firms' financial and banking characteristics; Estevao and Tevlin (1994) use output movements in sectors from which the employers' goods are purchased. On the face of it, this kind of work is an important methodological and substantive contribution to applied economics. However, at the time of writing, there is a difficulty with this group of papers. Their estimated rent-sharing effects are too large to be believable.

If the impact of profits on pay were statistically significant but small, the material summarized here would be of intellectual interest but not of great practical import. The competitive model would probably be close enough to the truth to be sufficient. This is not, however, what emerges from Table 4. Indeed, some results imply that the majority of wage dispersion is due to rent-sharing. Even if such remarkable conclusions do not survive future scrutiny (our instincts are that they will not), they hint at the importance of this research, and at likely controversy ahead. The latest step in rent-sharing work is new research on matched-panels by economists such as John Abowd at Cornell, Francis Kramarz at Paris, Andrew Hildreth at Berkeley, and Jonathan Gardner at Warwick.

4. Wages and Unemployment

The new macroeconomics textbook by Blanchard (1997) draws many diagrams in which the key role is played by a negatively-sloped curve linking the level of wage to the level of unemployment. He does this without appealing to any proof, but there now exists much evidence.

A central theme in a large time-series literature has been the idea that the extent of pay flexibility is very different across nations (Layard, Nickell and Jackman, 1991). However, some new microeconomic work has started to raise doubts about this idea.

If only a short run of aggregate data are available, it is extremely difficult to disentangle the true responsiveness of pay to unemployment in a world where many aggregate variables move together. An approach with more statistical power is to exploit a mixture of cross-section and longitudinal data. This makes it natural to study, say, regions through time. Microeconomic data drawn from internationally-comparable random samples provide economists with a rich resource for testing hypotheses. Ours is the first generation of economists to have this advantage. In this spirit, Blanchflower and Oswald (1994a) use random samples of individuals from twelve nations to document the existence of an empirical regularity or economic "law" between wage rates and the local unemployment rate, which they term the wage curve.

The samples used in the Blanchflower and Oswald book have statistical information on about three and a half million people. Pooled regressions for each of the countries are estimated using wages or earnings as the dependent variable and a local unemployment rate as one of the regressors. In most instances, this local rate is the degree of joblessness within the geographical area where the individual works. In a few cases, such as the USA and Korea, data are also

available for the industry rate of unemployment. Other control variables included in the earnings equations are conventional: age, gender, education, and so forth. Unemployment is usually entered as a logarithm in the wage equations, so that, because the dependent variable is also in logs, its coefficient can be read off as an elasticity. The unemployment elasticity of pay is the obvious name to describe this number.

This elasticity is found to be negative and close to one tenth.⁷ This implies that a doubling of unemployment is associated with a fall of ten percentage points in the level of pay. Examples are given in Blanchflower and Oswald (1994b). These estimates indicate that there seems to be a curve linking wages to the local rate of unemployment. It slopes down: higher joblessness in a region or industry means lower pay in that region or industry. The nature of this relationship, or wage curve, is almost identical across countries. It is also present, within nations, across different periods of time. A representative table of international unemployment elasticities derived from Blanchflower and Oswald (1994a) is given in Table 5.

Britain, Canada and the USA produce rather similar results. The estimates of the unemployment elasticity of pay lie in a range from -0.08 to -0.11 in almost all specifications. For the US data it is important to control for regional fixed effects, that is, to include a set of region dummies or to difference the data. Once this is done, Hall's (1970, 1972) positive spatial correlation between pay and joblessness becomes strongly negative. The twelve coefficients summarized in Table 5 are negative and in most cases well-defined. For some nations there are few years of data across which to pool, and it is then to be expected that the inclusion of regional dummies will lead to low t-statistics. Eire (Southern Ireland) is the analysis's only real outlier.

⁷For Britain, discussion of this kind of number goes back to time-series work such as Layard and Nickell (1986)

Its coefficient is so unstable that the results were almost left out; they should be treated sceptically.⁸ Korea, for which an industry wage curve alone can be estimated, has a low unemployment elasticity of -0.04. Future research, no doubt, will aim to chart divergences from the minus-point-one rule.

The same kind of wage curve has been shown for additional countries. Montgomery (1993) obtains an unemployment elasticity of pay for Japan of between -0.10 and -0.15. As this is close to the estimates just described for other countries, he finds little sign, contrary to the popular preconception, that Japan's labor market is unusually flexible. Although not well-known, Rebick's (1990) Japanese results are similar. Edin and Holmlund (1989), Holmlund and Skedinger (1993) and Edin, Holmlund and Ostros (1993) estimate a small but well-determined negative coefficient for regional unemployment in Sweden. Card (1990a, 1990b) and Christofides and Oswald (1992) discuss similar Canadian findings. They obtain an elasticity close to -0.1. Hoddinott (1996) produces an estimate of -0.13 for Cote d'Ivoire. This case is doubly interesting. It is one of the first estimates of the local unemployment elasticity of pay for a developing country, and its estimate is very much like those in the industrialized West. Bhalotra (1993) finds a negative effect for India. Although the coefficient is not always well-determined, once regional dummies are included the estimated elasticity at the mean is, somewhat remarkably, again -0.13. A remarkable paper by Kingdon and Knight (1998) finds a well-defined wage curve in newly-collected South African data. This country is interesting because it has an unemployment rate of approximately 30%. Kingdon and Knight have micro data on 6500 randomly-sampled workers that allows them to place individuals in one of up to three hundred

⁸In the case of Southern Ireland it proved impossible to even get a reliable-looking Mincer wage equation, so, regardless of wage curve estimation, there is something strange about the Irish data

different local areas within South Africa. The authors obtain, for a large range of subsamples and different estimation methods, an unemployment elasticity of between -0.07 and -0.12.

This evidence suggests that the degree of wage flexibility may be more similar across countries than has been believed. If this is the correct way to think, European governments have been focusing their policy efforts too much in this area.

To economists raised on the Harris-Todaro (1970) and Hall (1970, 1972) models, the results described in this new literature are probably a surprise. Those models predict that, to satisfy the spatial-equilibrium requirement that all regions provide the same expected utility, high-unemployment areas will also be high-wage regions. In other words, the wage locus should slope up. This hypothesis is rejected by the international microeconomic data. This does not mean that the idea of compensating differentials is wrong or irrelevant. Movements in actual wages can be negatively correlated with actual unemployment while at the same time "permanent" unemployment, put loosely, is positively related to "permanent" wages. The early empirical literature, stemming from Hall (1970), failed to control for regional fixed effects.

Three potential criticisms of the wage-curve literature are taken up in the Blanchflower and Oswald monograph. First, a check is made on the hypothesis that, because unemployment depends upon pay (perhaps through the functioning of a downward-sloping labor demand curve), OLS estimation of the wage curve is flawed by a lack of allowance for simultaneity bias. Attractive though such thinking is theoretically, little support for it could be found empirically. In US data, instrumenting regional unemployment by weather variables, military spending, industry mix, or lagged unemployment produces estimates of the unemployment elasticity of pay that are only fractionally higher than those from OLS methods. Although, as usual in

applied economics, we could always hope for better instruments, unemployment apparently has the characteristics of a predetermined variable. Second, it is shown that, for Britain and the US, it is necessary to correct the standard errors for bias caused, in estimation where the independent variable is more highly aggregated than the dependent variable, by common group effects. The nature of the difficulty, which until recently was routinely ignored in empirical research, is explained in sources such as Moulton (1986). When a correction is done, the substantive findings remain unchanged. Third, for only one country are regional consumer price data available, but theory suggests that it is real wages that are depressed by local unemployment. Although undesirable, there are reasons to think that this problem is not too serious. Controlling for regional prices in the British case leaves the wage curve intact. Nominal wages are likely to be sufficient whenever year dummies and regional dummies can be, as for most countries studied, included in the regression equations. The evidence for an industry wage curve is presumably immune to the criticism. Finally, if prices depend dominantly upon wages and a constant, they can be substituted out to leave a nominal reduced-form wage equation.

A simple logarithmic function of unemployment seems to do a reasonable job of capturing the patterns in the data⁹. For example, experiments using British data do not find statistically-significant effects from either long-term unemployment or non-linear unemployment terms. More research will be needed, however, before definite conclusions can be drawn. Pierre (1998) finds some evidence for a long-term unemployment variable in a wage equation.

One feature of the wage-curve work has attracted particular attention and criticism. This is the Blanchflower-Oswald finding that the degree of autoregression in region panel wage

⁹Early discussions of some of these issues can be found in Nickell (1987), Carruth and Oswald (1989) and Blackaby et al (1991)

equations is low. In other words, traditional estimation of the Phillips curve may be open to doubt. Blanchard and Katz (1997) have challenged this by using a slightly different data source.

They replicate the Blanchflower-Oswald results on the March CPS, but not on the Outgoing Rotation Group Files. The Blanchard-Katz results have the unusual feature that they imply a huge unemployment elasticity of pay in long-run equilibrium, in other words, in the steady state implied by the authors' equations, the effect on the wage level of a one percent rise in unemployment is much more negative than in the Blanchflower-Oswald work.

The existence of the wage curve seems to cast doubt on the relevance of the textbook competitive model of the labor market. It is difficult to see how the wage curve can be compatible within the simple standard framework. Nor can it be explained in a simple Phillips curve framework. In contrast, the observed curve is consistent with predictions in bargaining and efficiency-wage models. Before getting swept away by this fact, however, it is as well to bear in mind that the test is not a sharp one. These models predict a downward-sloping locus in wage-unemployment space, and there appears to be one. There may, however, be other explanations for the pattern.

At this point in time, however, the wage curve seems to help provide the missing empirical foundation for a new class of non-competitive macroeconomic models (the missing flat quasi-supply curve discussed by Woodford, 1992). Over the last few years, a small tide of new macroeconomics papers has swelled to become a movement to be taken seriously. Rowthorn (1977), David Soskice's unpublished Oxford lectures in the 1970s, Shapiro and Stiglitz (1984), Layard and Nickell (1986), Akerlof and Yellen (1990), Carlin and Soskice (1990), Layard, Nickell and Jackman (1991), Lindbeck (1993) and Phelps (1990, 1992, 1993, 1994) have

constructed macroeconomic models in which an aggregate wage curve not only appears but plays the principal role that marks the approach as different from convention. Hoon and Phelps (1992) call it a new paradigm in the economics of booms and slumps: the "hallmark of this theoretical approach is a labor market that exhibits involuntary unemployment" (p. 889). Lindbeck (1993) lucidly chronicles a similar framework. The crucial constituent in these analyses, which are longer on theoretical ideas than on empirical proof, is what Phelps (1992) describes as a quasi-labor supply curve or equilibrium wage locus. In Europe, perhaps because persistent high unemployment has seemingly become part of the wall-paper, this way of thinking is better developed than in the US. Layard and Nickell's (1986) paper brings aggregate data, as well as new theory, to bear on the problem. But aggregate evidence is less convincing than the more modern microeconomic findings.

The bottom line is that there is evidence consistent with the locus drawn in new texts such as Blanchard (1997), or the efficiency-wage no-shirking locus of papers such as Shapiro and Stiglitz (1984).

5. Minimum Wages and Unemployment

Countless textbooks have used minimum-wage laws as an example of a price floor. As Brown (1988) puts it, "an introductory textbook without a discussion of minimum wage laws might not be like a day without sunshine, but it would certainly rank with a morning without caffeine" (p. 134). The standard textbook analysis is in the context of supply and demand curves, that is, in the context of perfect competition. Thus, minimum wages are predicted to increase unemployment, particularly among the least skilled, such as teenagers. Relatively high

unemployment rates among teenagers is often cited as evidence of this effect, although there are obviously other factors which contribute to this.

Such was the conventional wisdom about minimum-wage laws until the recent work of Card and Krueger (1995). In the words of Card and Krueger, their

research provides fairly compelling evidence that minimum-wage increases have no systematic effect on employment. Indeed, some of the research... suggests that a rise in the minimum wage may actually increase employment.... This conclusion poses a stark challenge to the standard textbook model of the minimum wage (pp. 13-4).

Actually, Card and Krueger's evidence is not greatly different from the previous evidence on the employment effect of the minimum wage. In a well-known survey of the earlier evidence, Brown, Gilroy and Kohen (1982) conclude that their

survey indicates a reduction of between one and three percent in teenage employment as a result of a 10 percent increase in the federal minimum wage. We regard the lower part of this range as the most plausible.... (p. 508)

Moreover, the coefficient estimates of the effect of the minimum wage on employment in many of the studies in their review are not statistically greater than zero. In addition, minimum wages were found to have an even smaller effect on young adults than on teenagers, and a smaller effect on the teenage unemployment rate than on the teenage employment rate. If Brown (1988) had concluded that the minimum wage is "overrated", then Card and Krueger results simply show that it is really overrated.

There are two features of Card and Krueger's work, however, which make it particularly interesting. First, they exploit "quasi-experimental" data generated by legislated increases in the minimum wage. Their primary quasi-experiment occurred when New Jersey raised its minimum wage in 1992, while its neighbour Pennsylvania did not. The neighbouring state thus served as a control for unobserved factors which could contaminate the estimated impact of the minimum wage. Second, they collected microeconomic data from firms. This, in addition to obvious advantages of disaggregated data, allows them to test for possible compensating changes in fringe benefits, full-time versus part-time work, etc. These two features allowed Card and Krueger to estimate the impact of the minimum wage with a relatively high degree of precision and confidence. Moreover, they show that their results are consistent over a wide range of data sources. In short, the evidence that Card and Krueger provide on the impact of minimum wages on employment is both smaller (i.e., roughly nil) and apparently more believable than previous evidence.¹⁰

Card and Krueger's main finding is summarized in Table 6. Employment in fast-food restaurants in New Jersey increased slightly after the increase in the minimum wage there. At the same time employment in fast-food restaurants in neighbouring eastern Pennsylvania decreased. Thus, relative to the control group, employment increased significantly after the increase in the minimum wage. Moreover, this result is quite robust over various specifications and after controlling for various factors. Their implied minimum-wage elasticity of employment

¹⁰Most of the numerous reviews of the book are quite favourable. For instance, according to Ehrenberg (1995), the "extraordinarily important book... may well be the most important labor economics monograph of the 1990s" (p. 827). Hamermesh (1995) and Welch (1995), however, are less than convinced of Card and Krueger's findings.

is 0.3 (as compared to the -0.1 to -0.3 range suggested by the Brown et al. survey).¹¹ They also find comparable results using broader data from the Current Population Survey; using Texas data from the 1991 increase in the federal minimum wage; using data from the 1988 increase in the minimum wage in California; and so on.¹²

Moreover, similar findings have recently been found in other countries. According to the Machin and Manning (1996) survey, "there seems to be a clear pattern of results suggesting that one cannot identify any evidence of a negative impact" (p. 670) on employment from minimum wages in the UK (operating through Wages Councils). And according to Machin and Manning (1997), "on the basis of our analysis of four countries (France, Netherlands, Spain, and UK) we find little evidence that minimum wages have a bad impact on jobs" (p. 741).

Given the controversial nature of these findings, however, there is little doubt that there will be further empirical testing of the employment effect of minimum wages. Indeed, Neumark and Wascher (1995) use an alternative data set and claim to overturn Card and Krueger's findings.¹³ Using macroeconomic data, Deere, Murphy and Welch (1995) confirm the earlier findings of a significant negative impact from minimum wage increases. Brown (1995) and Hamermesh (1995) stress that long-run responses are likely to be considerably larger than the

¹¹ Although the estimated impact on employment is statistically greater than zero in their primary case shown in Table 3, and greater than zero in all their cases, in most of their cases the estimated effect is not statistically different than zero.

¹² Card and Krueger also provide evidence suggestive of a publication bias toward confirming the standard theoretical prediction. They show two pieces of evidence for this. First, if there is no publication bias, the t-statistic should increase proportionally with the square root of the degrees of freedom. Their "meta-analysis" of the previous evidence shows that t-statistic actually decreases slightly with the square root of the degrees of freedom. Second, their meta-analysis shows that the coefficient estimates are positively related to their standard errors (apparently quite close to double, i.e., t-statistics seem to cluster around two), while they should be uncorrelated if there is no publication bias. Further examination by Neumark and Wascher (1998), however, failed to indicate publication bias.

¹³ Using yet another data set, however, Card and Krueger (1998) confirm their original findings and argue that

short-run responses measured by Card and Krueger. Thus, the empirical issue is not yet completely settled. But it does seem safe to conclude that minimum wages have a much smaller impact on employment than can be explained within the context of the standard competitive model of labour markets.¹⁴ As Machin and Manning (1996) state, "the emphasis seems to have shifted from 'how negative are the employment effects?' to 'is there an employment effect?'" (p. 667).

The competitive model unambiguously predicts that minimum wages discourage employment, regardless of the functional forms of preferences and technology, or the degree of competition in output markets. Thus, the empirical evidence suggests that labour markets are not adequately characterized by a simple supply and demand framework. A possible explanation for the empirical findings is that firms have some degree of monopsony power over the wages they pay, even in the market for low-skilled labour (i.e., where the degree of monopsony power should be the least).¹⁵ But, as discussed in Card and Krueger, there are other possible explanations. Burdett and Mortensen (1998) show that monopsony-like behaviour can emerge in an equilibrium model of job search. Rebitzer and Taylor (1995) and Manning (1995) demonstrate monopsony-like behaviour in an efficiency-wage model. Lang and Kahn (1998) show that the empirical findings can be explained within an equilibrium model of bilateral search. And Bhaskar and To (1998) reconcile Card and Krueger's findings in a model where

¹⁴In the competitive model the minimum-wage elasticity of employment should be equal to the total wage elasticity of labour demand, which even in the short run is probably about -0.5 or less (according to the Fuchs et al. (1998) survey of labour economists).

¹⁵It should be noted, however, that not all of Card and Krueger's findings are completely consistent with the simple monopsony story either. They find conflicting evidence that the cost of the minimum wages is passed on to consumers in the form of higher prices (the cost is not passed on to consumers in the monopsony model).

monopolistically-competitive firms have some monopsony power arising from heterogenous job characteristics.

6. Education and Unemployment

Numerous studies, for example, Mincer (1974, 1993), Ashenfelter and Ham (1979), Nickell (1979), Nickell and Bell (1995, 1996), and Phelps and Zoega (1996, 1997), have documented the empirical regularity that groups with higher levels of education have much lower unemployment rates than those with less education. Indeed, Mincer (1993) argues that this is one of the three major benefits of education (along with higher wages and greater upward mobility). Table 7, taken from Nickell and Bell (1995, 1996), is suggestive of this empirical regularity.¹⁶ There is a strong negative relationship between unemployment and education across (developed) countries and over time.¹⁷ The evidence in Table 7 suggests that the low-education group has an unemployment rate which is about three times that of the high-education group. Moreover, this is not just a recent phenomenon. It was apparent well before the 1970s.

Table 8, from Mincer (1993), yields more light on the empirical relationship between education and unemployment (for American men during the period 1976-81).¹⁸ Along with the unemployment rate, this table shows for various education groups the yearly probability of being unemployed during the year (unemployment incidence), the yearly probability of

¹⁶The education groupings in Table 7 vary across countries. Typically the low education group consists of those with less than a full secondary education, and the high education group consists of those with at least some higher education.

¹⁷Italy is the only exception to the rule in Table 7. Phelps and Zoega (1996), however, show that this case is misleading due primarily to demographic change. When they examine the unemployment rates for those over 30, they show a low/high ratio of 2.4 over the 1977-92 period.

¹⁸Remarkably similar patterns were found by Nickell (1979) using 1972 UK data.

separating from a job (job separation rate), the conditional probability of becoming unemployed given a job separation (unemployment probability of job separators), the average unemployment spell (unemployment duration), and the labour-force participation rate. This table shows that those with more education have somewhat lower durations of unemployment on average. Unemployment durations are almost three weeks (26 percent) longer for secondary-school dropouts on average compared to university graduates. But this only explains a small part of their dramatically different unemployment rates. The differences in unemployment rates are primarily due to the differences in unemployment incidence. Secondary-school dropouts are 2.7 times more likely than university graduates to experience unemployment during a year. This accounts for roughly three quarters of the differences in unemployment rates across education groups.

Table 8 also reveals that the differences in unemployment incidence are due in roughly equal parts to the differences in the frequency of job separations and in the conditional probability of unemployment for job separators. By construction, the unemployment incidence rate equals the job separation rate times the unemployment probability of job separators. Thus the fact that secondary-school dropouts are 2.7 times more likely than university graduates to experience unemployment during a year can be decomposed into a 1.7 times higher frequency of job separations times a 1.6 times higher conditional unemployment incidence. Apparently those with more education not only switch jobs less frequently, but when they do, they are much more likely to move straight into another job without experiencing unemployment.

It is tempting to conclude that this empirical pattern occurs because job separations are much more likely to be the workers' decisions (that is, quits rather than layoffs) for those with

more education, and thus this group generally has more chance to engage in job search during employment. But, apparently, this is not the explanation. The data indicate that the effect of education on quit and layoff probabilities are almost proportional. Thus education increases the ratio of quits to layoffs only slightly. Mincer (1993) concludes that this can explain no more than one-sixth of the differences in conditional unemployment probabilities across education groups.

Moreover, Mincer shows that the basic patterns revealed in Table 8 remain after controlling for other explanatory variables such as experience, union status, marriage status, and so forth. Controlling for job tenure and rough measures of on-the-job training, however, significantly reduces, but does not remove, the estimated impact of education on both unemployment-incidence components. The effect of education on unemployment incidence is almost halved after controlling for these factors.

As yet the empirical and theoretical relationship between education and unemployment has not been thoroughly researched. Thus, it is not entirely clear what forces drive these empirical findings. At this point the evidence on unemployment and education seems to point to two important types of effects at work. One of these is that job search appears to be significantly more successful for those with more education. This is the only apparent explanation for the moderate negative correlation between education and unemployment durations. It also seems to provide most of the explanation for the strong negative correlation between education and conditional unemployment incidence. Moreover, there are three theoretical reasons to expect more successful job search for those with more education. Those with more education have incentives for greater search intensity because of their higher relative

opportunity costs (because unemployment benefits are generally less than proportional). Those with more education are likely to be more efficient in acquiring and processing job-search information. And firms are likely to have greater incentives to engage in job search for positions which are typically filled by more-educated workers, because these positions are likely to have relatively higher fixed costs.

But differences in job-search behaviour cannot explain why education is strongly negatively correlated with the frequency of job separations. The other apparent force at work is that the quasi-rents from employment relationships are correlated with education. Quasi-rents arise from employment relationships because of turnover costs and because of firm-specific investments in human capital. These rents are lost when an employment relationship is broken. Thus, the presence of quasi-rents in labour markets means that there will generally be an incentive for both employees and employers parties to continue employment relationships.¹⁹ Moreover, those with more education are likely to obtain more on-the-job training, and this type of investment in human capital will be firm-specific to some extent. Mincer (1993) provides some evidence of this. This is also likely theoretically because those with more education are likely to be relatively better learners. In addition, this provides a well-known explanation of the significantly steeper earnings profiles of those with more education. As noted earlier, however, much of the significant negative correlation between education and the frequency of job separations remains after controlling for job tenure and on-the-job training. Thus it appears that turnover costs are also correlated with education.

¹⁹For more this point see, for example, Oi (1962), Parsons (1972), Becker (1975) and the recent survey by Malcomson (1997).

There are a number of obvious and not-so-obvious implications of the empirical evidence on education and unemployment. It suggests that unemployment outcomes are sensitive to job-search effort and technology, which in turn implies that there is scope for policies to affect long-run unemployment rates. For example, Phelps and Zoega's (1996) cross-country data indicate that the unemployment rates across education groups are not significantly affected by the relative sizes of the groups. Thus, they contend, educational upgrading of a country's labour force can significantly reduce its unemployment rate. Their simulations suggest that the unemployment rate in the US would be two percentage points higher in 1994 if not for its educational upgrading since 1970, and the unemployment rate in the UK would be 1.5 percentage points higher in 1992 if not for its educational upgrading since 1973. Although estimates this large are hard to believe, they warrant further study.

The evidence on education and unemployment suggests that labour markets are characterized by long-term implicit contracts, as opposed to the standard spot-market model of labour markets. This in turn may have some implications for helping to understand business-cycle phenomena, such as apparent wage stickiness and labour hoarding. Less obviously, some recent research by Caballero and Hammour (1996, 1998) argues that the "specificity" of investments is fundamental in driving business-cycle phenomena. Although these authors may not be aware of it, the empirical relationship between education and unemployment highlights the importance of specific investments in labour markets.

The evidence also suggests that investments in human capital may reduce earnings risk. This empirical evidence is at odds with the numerous theoretical models of human capital and uncertainty which have assumed that these investments are risky. The policy prescriptions for

education and training in these studies will clearly vary depending on the riskiness of investments in human capital. Moreover, the apparent risk-reducing nature of investments in education will affect and be affected by precautionary motives, which recent research suggests are a crucial element of saving behaviour.²⁰

In addition, this evidence indicates that investment in human capital and time spent working are not independent. A number of studies have shown that, theoretically, human capital and work are jointly determined (*ex ante*).²¹ To a large extent, however, the implications of this seem to have been forgotten. For instance, because human capital may be crucial in driving endogenous growth, models with human capital accumulation have become increasingly common over the past decade. Most of these models, however, have been considerably simplified by assuming that work time is independent of human capital. Moreover, in addition to being untenable empirically, this simplifying assumption has been shown to be quite limiting in some recent research. Trostel (1993) found that the interdependency between human capital investment and subsequent work is crucial in the controversy over the extent that taxation affects human capital accumulation. Similarly, Stokey and Rebelo (1995) found that this interdependency is crucial in the controversy over the extent that taxation affects economic growth. In addition, empirical research on labour supply has ignored the interaction between education and work. Education is implicitly assumed to affect the wage rate, but not hours of work. In a full life-cycle perspective, however, education is endogenously determined along with hours of work. Therefore, previous estimates of labour supply responses may be biased.

²⁰This work is being further developed in Trostel, Perroni and Walker (1998).

²¹See Ghez and Becker (1975), Blinder and Weiss (1976), Heckman (1976), Ryder, Stafford and Stephen (1976) and Weiss and Gronau (1981).

Similarly, empirical research on the rate of return to education may be biased because the interaction between education and hours worked has again been ignored. In particular, the failure to control for the correlation between schooling and employment causes a sample-selection problem.

7. Home Ownership and Unemployment

One way to assess the value of modern research on the labour market and macroeconomics is to ask how much it has helped answer pressing policy issues. For example, has research allowed us to understand why unemployment rates in the industrialized countries are so high? (It might be argued that unemployment is voluntary and at its socially efficient level, but few Europeans sign up to such a view, and as explained, happiness regressions cast doubt on it.) The OECD Jobs Study of June 1994 referred to unemployment as "probably the most widely feared phenomenon of our time". As high levels of joblessness are seen by politicians and economics journalists as perhaps Europe's major economic-policy issue, here there is a chance for labour and macro research to show its mettle. Moreover, the criterion for success is sharp. Can economists suggest ideas that would lead, a few years later, to visibly lower rates of unemployment?

Journalists have written a great deal about the causes of Western unemployment, and seem to have firm views.

Europe's unemployment crisis is deep-seated and self-inflicted. Over-generous social protection and labour market rigidity have resulted in a situation where continental economies have forgotten how to create jobs. (*Sunday Times*, editorial, 9 February 1997)

And as this paper was being written:

Unemployment rates... are particularly high in countries with heavy labour-market restrictions... high minimum wages, payroll taxes,... and job protection laws. (*The Economist*, 22 August 1998, p. 88)

Researchers themselves usually put it more cautiously. For example:

We do appear to be able to gain some understanding of why unemployment varies such a great deal across different countries... (but) why unemployment is so much higher now than in the 1960s is a much harder question... and we do not have a really satisfactory answer. (Nickell, 1998, p. 813)

What is the quality of the evidence supporting the journalists' statements? Not terribly strong, if one looks at the data. For example, if statistics are taken for a cross-section of 20 countries in the 1990s, running unemployment regressions with a single variable each time on the right hand side gives Table 9, where in almost all cases it is impossible to reject the null of zero on the relevant coefficient. These right-hand side numbers are R-squared values. The results above are based on regressions that each use only 20 observations. They are not to be thought of as serious attempts to explain unemployment, but rather to give a feel for how poor the cross-section correlations are. Yet it is such simple correlations, presumably, that motivate journalists' writings (if they use evidence).

These data were kindly supplied by Steve Nickell, except that the home-ownership numbers come from Oswald (1996). It is worth bearing in mind that many of the variables above

are measured in mechanical ways and must be prone to severe error. For instance, Benefit Duration takes only values up to the integer 4. Those countries with indefinite unemployment benefits are assigned the number 4 in Nickell's regressions, which might not be thought a good approximation to infinity.

Some of the most influential work on unemployment has been done by a team of economists at the London School of Economics. Here we take the latest example of that long-running research programme, Nickell (1998), and study its arguments.

Nickell addresses the question: why does unemployment vary so much across the OECD? He concludes by blaming the following culprits: high unemployment benefits, long-lasting unemployment benefits, trade unionism, and the tax wedge. Nickell also finds (following Oswald, 1996) that high unemployment is associated with large amounts of owner-occupation in the housing market. Table 10, which gives the home-ownership and unemployment rates in the OECD around 1990, shows this correlation. Nickell concludes, too, that some countries manage to have better unemployment performance by running "active labour market" policies and by having coordination between unions and employers. Apart from the new addition of a housing variable (the argument in Oswald 1996, 1997a, 1997b is that lack of renting reduces labour mobility and worsens the efficiency of the labour market), the analysis is essentially identical in spirit to that produced by the LSE team (also including Richard Layard and Richard Jackman) since the mid 1980s. The method of analysis, however, is fractionally different from that done in the group's earlier work. Layard, Nickell and Jackman (1991), for example, contains no country panel estimation of the sort described below.

Nickell (1998) takes data on twenty Western countries. Two points in time are studied. The first is an average of years from 1983-88; the second is 1989-94. Nickell then has 40 observations with which to work, and he estimates, by GLS random effects, the kind of equation shown in Table 11. The dependent variable here is the log of the unemployment rate. The typical way to read off the size of the effect from each variable on to unemployment is to bear in mind that the regressors are measured in percentage points. For instance, the mean benefit replacement rate is approximately 50. According to Nickell, a 10 percentage point increase in the unemployment benefit replacement rate combined with an increase of one year in duration entitlement would make total unemployment rise by a quarter. Nickell also checks, but finds no strong statistical role for, real interest rates, hiring and firing restrictions, and payroll taxes.

What should an economist make of the regression equation given in Table 11? An immediate difficulty is that there are so few observations (moreover, the 40 are not independent, as they are drawn twice from 20 nations). One reaction -- presumably the philosophy of Steve Nickell -- is that this topic is of immense importance to social welfare, so that, while the scientific quality of such correlations cannot be persuasive, looking at panel regression equations is an important antidote to the journalist's penchant for cross-sections and simple means. There seems much to be said for this.

An alternative view is that the regression equation is likely to be over-fitted -- in other words that including nine regressors is not sensible. Furthermore, it is not clear what causal interpretation to put on the regression. Among many potential identification issues is the point made by Di Tella and MacCulloch (1995) that the generosity of unemployment benefits is

influenced -- for straightforward political reasons -- by how much unemployment there is in a country.

Another possibility is that country fixed-effects probably make the estimation of such a regression unreliable. When one experiments with the data, the Hausman test tends to hover around the border of rejecting the null (that the random effects restrictions are satisfied).

Then there is the issue of robustness. In passing, it is worth noting what happens if the unemployment equation is re-estimated allowing only two regressors each time - home ownership and benefit duration, home ownership and employer coordination, home ownership and ..., etc. In such regressions (available on request), the coefficient and well-determined t-statistic on home ownership hardly alters from one specification to another. However, the great majority of the other variables have poorly determined t-statistics and do not appear terribly robust. It is when many variables are entered together that the apparently strong results of Nickell (1998) are found.

The coefficient estimate on home ownership is less fragile than the others. The link between unemployment and home ownership also holds in panels of states for the US, and in other settings (Oswald 1996, 1997b). But here too there is a great deal to be learned.

The work by Nickell, which is rightly some of the most influential, seems to illustrate a standard dilemma faced by applied economists. The more interesting the problem, the less one can say for sure. Measuring the correlation of variable X with some variable Y using a giant micro data set is an easier task than discovering why Europe has high unemployment.

8. Conclusion

We have summarized six recent empirical findings about labor markets. We believe that these are relevant to macroeconomics.

Psychological data indicate that unemployment substantially reduces people's well-being. There is evidence of rent sharing in the labour market. The data suggest a wage-curve, with an elasticity of about -0.1. Minimum wages do not appear to have a noticeable negative impact on low-skilled employment. The data show that, at the personal level, education is associated with lower unemployment. There is evidence, at the national level, that unemployment rates are more highly associated with home-ownership rates than with other variables.

The primary lesson from this selective review seems to be that disparate types of evidence suggest labour markets do not operate in a simple competitive spot fashion. These emerging empirical findings will face opposition. The competitive-spot-market paradigm is the dominant way the profession thinks (both formally and informally). The majority of macro-type models of labour markets are based on the competitive demand-supply framework. Similarly, some macroeconomic research rests upon the implicit assumption that unemployment is a voluntary.

These modelling strategies will not change quickly. There are perhaps three significant obstacles. First, and probably most importantly, it is not clear what the appropriate alternative strategy should be. At this point, the empirical evidence does not point decisively to a precise form of alternative non-competitive paradigm (although rent-sharing and efficiency-wage models look promising). Second, there are significant fixed costs associated with any such change. Third, ideology may get in the way.

References

- Abowd, John M. and Thomas Lemieux (1993) "The Effects of Product Market Competition on Collective Bargaining Agreements: The Case of Foreign Competition in Canada" *Quarterly Journal of Economics*, 108: 983-1014.
- Akerlof, George A. and Janet L. Yellen (1990) "The Fair Wage-Effort Hypothesis and Unemployment" *Quarterly Journal of Economics*, 105: 255-84.
- Angrist, Joshua D. and Alan B. Krueger (1998) "Empirical Strategies in Labor Economics," in *Handbook of Labor Economics*, forthcoming.
- Ashenfelter, Orley and John Ham (1979) "Education, Unemployment, and Earnings" *Journal of Political Economy*, 87: S99-116.
- Becker, Gary S. (1975) *Human Capital*, 2nd ed, Columbia University Press.
- Bhalotra, S. (1993) "Geographical Differences in Unemployment and Wage Rates in India" mimeo, Wolfson College, Oxford University.
- Bhaskar, V. and Ted To (1998) "Minimum Wages for Ronald McDonald Monopsonies: A Theory of Monopolistic Competition" *Economic Journal*, forthcoming.
- Blackaby, D. H., R. C. Bladen-Hovell and E. J. Symons (1991) "Unemployment, Duration and Wage Determination in the UK: Evidence from the FES, 1980-86" *Oxford Bulletin of Economics and Statistics*, 53: 377-99.
- Blanchard, Olivier (1997) *Macroeconomics*, Prentice Hall, London.
- _____ and Lawrence F. Katz (1997) "What We Know and Do Not Know About the Natural Rate of Unemployment" *Journal of Economic Perspectives*, 11: 51-72.
- Blanchflower, David G. and Richard B. Freeman (1994) "The Legacy of Communist Labor Relations" *Industrial and Labor Relations Review*, 50: 438-59.
- _____ and Andrew J. Oswald (1994a) *The Wage Curve*, MIT Press.
- _____ and _____ (1994b) "Estimating a Wage Curve for Britain: 1973-1990" *Economic Journal*, 104: 1025-43.
- _____, _____ and Mario D. Garrett (1990) "Insider Power in Wage Determination" *Economica*, 57: 363-70.
- _____, _____ and Peter Sanfey (1996) "Wages, Profits and Rent-Sharing" *Quarterly Journal of Economics*, 111: 227-52.
- _____, _____ and Peter B. Warr (1993) "Well-Being Over Time in Britain and the USA" paper presented at the November 1993 Happiness and Fairness Conference, London School of Economics.
- Blinder, Alan S. and Yoram Weiss (1976) "Human Capital and Labor Supply: A Synthesis" *Journal of Political Economy*, 84: 449-72.
- Brosius, Jacques (1998) "Rent-Sharing in the UK Labour Market: A Co-Integration Analysis" Dissertation, University of Warwick.
- Brown, Charles (1988) "Minimum Wage Laws: Are They Overrated?" *Journal of Economic Perspectives*, 2: 133-45.
- _____ (1995) "Comment on *Myth and Measurement: The New Economics of the Minimum Wage*" *Industrial and Labor Relations Review*, 48: 828-30.

- _____, Curtis Gilroy and Andrew Kohen (1982) "The Effect of the Minimum Wage on Employment and Unemployment" *Journal of Economic Literature*, 20: 487-528.
- Burdett, Kenneth and Dale T. Mortensen (1998) "Wage Differentials, Employer Size, and Unemployment" *International Economic Review*, 39: 257-73.
- Caballero, Ricardo J. and Mohamad L. Hammour (1996) "The 'Fundamental Transformation' in Macroeconomics" *American Economic Review*, 86: 181-6.
- _____ and _____ (1998) "The Macroeconomics of Specificity" *Journal of Political Economy*, 106: 724-67.
- Card, David (1990a) "Unexpected Inflation, Real Wages, and Employment Determination in Union Contracts" *American Economic Review*, 80: 669-88.
- _____ (1990b) "Strikes and Wages: A Test of an Asymmetric Information Model" *Quarterly Journal of Economics*, 105: 625-60.
- _____ (1995) "Earnings, Schooling, and Ability Revisited" *Research in Labor Economics*, 14: 23-48.
- _____ and Alan B. Krueger (1995) *Myth and Measurement: The New Economics of the Minimum Wage*, Princeton University Press.
- _____ and _____ (1998) "A Reanalysis of the Effect of the New Jersey Minimum Wage Increase on the Fast-Food Industry with Representative Payroll Data" NBER Working Paper No. 6386.
- Carlin, W. and D. Soskice (1990) *Macroeconomics and the Wage Bargain*, Oxford University Press.
- Carruth, Alan A. and Andrew J. Oswald (1989) *Pay Determination and Industrial Prosperity*, Oxford University Press.
- Christofides, Louis N. and Andrew J. Oswald (1992) "Real Wage Determination and Rent-Sharing in Collective Bargaining Agreements" *Quarterly Journal of Economics*, 107: 985-1002.
- Clark, Andrew E. and Andrew J. Oswald (1994) "Unhappiness and Unemployment" *Economic Journal*, 104: 648-59.
- _____ and _____ (1996) "Satisfaction and Comparison Income" *Journal of Public Economics*, 61: 359-381.
- _____ and _____ (1998) "Unhappiness and Unemployment: Panel Findings", mimeo, University of Orleans, France.
- Currie, Janet and Sheena, McConnell (1992) "Firm-Specific Determinants of the Real Wage" *Review of Economics and Statistics*, 74: 297-304.
- Deere, Donald, Kevin M. Murphy and Finis Welch (1995) "Employment and the 1990-1991 Minimum-Wage Hike" *American Economic Review*, 85: 232-7.
- Denny, Kevin and Stephen Machin (1991) "The Role of Profitability and Industrial Wages in Firm-Level Wage Determination" *Fiscal Studies*, 12: 34-45.
- Dickens, William T. and Lawrence F. Katz (1987) "Inter-Industry Wage Differences and Industry Characteristics" in Lang, Kevin and Jonathan S. Leonard (eds), *Unemployment and the Structure of Labor Markets*, Basil Blackwell.
- Di Tella, Rafael and Robert MacCulloch (1995) "The Determination of Unemployment Benefits" mimeo, Oxford University.

- Di Tella, Rafael, Robert MaCulloch and Andrew J. Oswald (1997) "The Macroeconomics of Happiness" mimeo, Harvard Business School. Presented at the Fall 1997 NBER Behavioral Macroeconomics conference.
- Edin, P.A. and B. Holmlund (1989) "The Unemployment Elasticity of Pay: Evidence from Swedish Micro Data" mimeo, University of Uppsala.
- _____, _____ and T. Ostros (1993) "Wage Behavior and Labor Market Programs in Sweden: Evidence from Micro Data" Working Paper 93-1, University of Uppsala, 1993. Forthcoming in T. Tachibanaki (ed), *Labour Markets and Economic Performance: Europe, Japan and the US*, Macmillan.
- Ehrenberg, Ronald G. (1995) "Editor's Introduction to Review Symposium on *Myth and Measurement: The New Economics of the Minimum Wage*" *Industrial and Labor Relations Review*, 48: 827-8.
- Estevao, Marcello and Stacey Tevlin (1994) "The Role of Profits in Wage Determination: Evidence from US Manufacturing" mimeo, MIT.
- Fuchs, Victor R., Alan B. Krueger and James M. Poterba (1998) "Why Do Economists Disagree About Policy? The Roles of Beliefs About Parameters and Values" *Journal of Economic Perspectives*, forthcoming.
- Gardner, Jonathan (1998) "Rent Sharing and Matched Panels" mimeo, University of Warwick.
- Gerlach, K. and G. Stephan (1996) "A Paper on Unhappiness and Unemployment in Germany" *Economics Letters*, 52: 325-30.
- Ghez, Gilbert R. and Gary S. Becker (1975) *The Allocation of Time and Goods Over the Life Cycle*, Columbia University Press.
- Hall, R. E. (1970) "Why is the Unemployment Rate So High at Full Employment?" *Brookings Papers on Economic Activity*, 3: 369-402.
- _____ (1972) "Turnover in the Labor Force" *Brookings Papers on Economic Activity*, 3: 709-56.
- Hamermesh, Daniel S. (1993) *Labor Demand*, Princeton University Press.
- _____ (1995) "Comment on *Myth and Measurement: The New Economics of the Minimum Wage*" *Industrial and Labor Relations Review*, 48: 835-8.
- _____ (1998) "The Art of Labormetrics" forthcoming in Handbook of Econometrics, North Holland.
- Harris, J. R. and M. P. Todaro (1970) "Migration, Unemployment and Development: A Two-Sector Analysis" *American Economic Review*, 60: 126-42.
- Heckman, James J. (1976) "A Life-Cycle Model of Earnings, Learning, and Consumption" *Journal of Political Economy*, 84: S11-44.
- Hildreth, Andrew K. G. and Andrew J. Oswald (1997) "Rent-Sharing and Wages: Evidence from Company and Establishment Panels" *Journal of Labor Economics*, 15: 318-37.
- Hoddinott, J. (1996) "Wages and Unemployment in an Urban African Labour Market" *Economic Journal*, 106: 1610-26.
- Holmlund, B. and P. Skedinger (1993) "Wage Bargaining and Wage Drift: Evidence From the Swedish Wood Industry" in L. Calmfors (ed), *Wage Formation and Macroeconomic Policy in the Nordic Countries*, Oxford University Press.
- Hoon, Hian T. and Edmund S. Phelps (1992) "Macroeconomic Shocks in a Dynamized Model of the Natural Rate of Unemployment" *American Economic Review*, 82: 889-900.

- Kingdon, G. and J. Knight (1998) "Unemployment and Wages in South Africa: A Spatial Approach" mimeo, Institute of Economics and Statistics, Oxford University.
- Korpi, T. (1997) "Is Utility Related to Employment Status? Employment, Unemployment, Labor Market Policies and Subjective Well-being among Swedish Youth" *Labour Economics*, 4: 125-48.
- Krueger, Alan B. and Lawrence H. Summers (1987) "Reflections on the Inter-Industry Wage Structure" in Lang, Kevin and Jonathan S. Leonard (eds), *Unemployment and the Structure of Labor Markets*, Basil Blackwell.
- _____ and _____ (1988) "Efficiency Wages and the Inter-Industry Wage Structure" *Econometrica*, 56: 259-93.
- Krugman, Paul (1998) "The \$300,000 Man: The Strange Economics of Economists" *Slate*, or www.mit.edu/krugman.
- Lang, Kevin and Shulamit Kahn (1998) "The Effect of Minimum-Wage Laws on the Distribution of Employment: Theory and Evidence" *Journal of Public Economics*, 69: 67-82.
- Layard, P. R. G. and Stephen J. Nickell (1986) "Unemployment in Britain" *Economica*, 53: S121-70.
- _____, _____ and R. Jackman (1991) *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press.
- Lindbeck, A. (1993) *Unemployment and Macroeconomics*, MIT Press.
- Machin, Stephen and Alan Manning (1996) "Employment and the Introduction of a Minimum Wage in Britain" *Economic Journal*, 106: 667-76.
- _____ and _____ (1997) "Minimum Wages and Economic Outcomes in Europe" *European Economic Review*, 41: 733-42.
- Malcomson, James M. (1997) "Contracts, Hold-Up, and Labor Markets" *Journal of Economic Literature*, 35: 1916-57.
- Manning, Alan (1995) "How Do We Know that Real Wages Are Too High?" *Quarterly Journal of Economics*, 110: 1111-25.
- Mincer, Jacob (1974) *Schooling Experience, and Earnings*, Columbia University Press.
- _____ (1993) *Studies in Human Capital (Collected Essays of Jacob Mincer)*, Edward Elgar.
- Montgomery, E. B. (1993) "Patterns in Regional Labor Market Adjustment: The US Versus Japan" NBER Working Paper No. 4414.
- Moulton, B. R. (1986) "Random Group Effects and the Precision of Regression Estimates" *Journal of Econometrics*, 32: 385-97.
- Neumark, David and William Wascher (1995) "The Effect of New Jersey's Minimum Wage Increase on Fast-Food Employment: A Reevaluation using Payroll Records" NBER Working Paper No. 5224.
- _____ and _____ (1998) "Is the Time-Series Evidence on Minimum Wage Effects Contaminated by Publication Bias?" *Economic Inquiry*, forthcoming.
- Nickell, Stephen (1979) "Education and Lifetime Patterns of Unemployment" *Journal of Political Economy*, 87: S117-31.
- _____ (1987) "Why is Wage Inflation in Britain so High?" *Oxford Bulletin of Economics and Statistics*, 49: 103-28.
- _____ (1998) "Unemployment: Questions and Some Answers" *Economic Journal*, 108: 802-16.

- _____ and Brian Bell (1995) "The Collapse in Demand for the Unskilled and Unemployment Across the OECD" *Oxford Review of Economic Policy*, 11: 40-62.
- _____ and _____ (1996) "Changes in the Distribution of Wages and Unemployment in OECD Countries" *American Economic Review*, 86: 302-8.
- _____ and Daphne Nicolitsas (1994) "Wages, Effort and Productivity", mimeo, Oxford University, 1994.
- _____ and Sushil Wadhvani (1990) "Insider Forces and Wage Determination" *Economic Journal*, 100: 496-509.
- Oi, Walter Y. (1962) "Labor as a Quasi-Fixed Factor" *Journal of Political Economy*, 70: 538-55.
- Oswald, Andrew J. (1986) "Unemployment Insurance and Labor Contracts under Asymmetric Information: Theory and Facts" *American Economic Review*, 76: 365-77.
- _____ (1996) "A Conjecture on the Explanation for High Unemployment in the Industrialized Nations: Part I" working paper 475, 1996. Available on www.warwick.ac.uk/fac/soc/Economics/person/oswald.htm.
- _____ (1997a) "Thoughts on NAIRU" *Journal of Economic Perspectives*, 11: 227-28.
- _____ (1997b) "The Missing Piece of the Unemployment Puzzle," inaugural lecture. Available on www.warwick.ac.uk/fac/soc/Economics/person/oswald.htm.
- Parsons, Donald O. (1972) "Specific Human Capital: An Application to Quit Rates and Layoff Rates" *Journal of Political Economy*, 80: 1120-43.
- Phelps, Edmund S. (1990) "Effects of Productivity, Total Domestic Product Demand and Incentive Wages on Unemployment in a Non-Monetary Customer-Market Model of the Small Open Economy" *Scandinavian Journal of Economics*, 92: 353-68.
- _____ (1992) "Consumer Demand and Equilibrium Unemployment in a Working Model of the Customer-Market Incentive-Wage Economy" *Quarterly Journal of Economics*, 107: 1003-32.
- _____ (1993) "Foreign and Domestic Determinants of Unemployment Rates Through Real-Interest and Real-Exchange Rate Channels" seminar paper presented at LSE.
- _____ (1994) *Structural Slumps*, Harvard University Press.
- _____ and Gylfi Zoega (1996) "The Incidence of Increased Unemployment in the Group of Seven, 1979-1994" Institute of Economic Studies Working Paper No. 97:03.
- _____ and _____ (1997) "The Rise and Downward Trend of the Natural Rate" *American Economic Review*, 87: 283-9.
- Pierre, Gaelle (1998) "Testing for Long Term Unemployment in a Wage Equation" mimeo, University of Warwick.
- Psacharopoulos, George (1994) "Returns to Investment in Education: A Global Update" *World Development*, 22: 1325-43.
- Rebeck, M. (1990) "Widening Firm Size Differentials in Japan" mimeo, Harvard University.
- Rebitzer, James B. and Lowell J. Taylor (1995) "The Consequences of Minimum Wage Laws: Some New Theoretical Ideas" *Journal of Public Economics*, 56: 245-55.
- Rowthorn, R. E. (1977) "Conflict, Inflation and Money" *Cambridge Journal of Economics*, 1: 215-39.
- Ryder, Harl E., Frank P. Stafford and Paula E. Stephan (1976) "Labor, Leisure and Training over the Life Cycle" *International Economic Review*, 17: 651-74.

- Shapiro, Carl and Joseph E. Stiglitz (1984) "Equilibrium Unemployment as a Worker Discipline Device" *American Economic Review*, 74: 433-44.
- Slichter, Sumner (1950) "Notes on the Structure of Wages" *Review of Economics and Statistics*, 32: 80-91.
- Smith, Jennifer C. (1996) "Wage Interactions: Comparisons or Fall-Back Options?" *Economic Journal*, 106: 495-506.
- Stokey, Nancy L. and Sergio Rebelo (1995) "Growth Effects of Flat-Rate Taxes" *Journal of Political Economy*, 103: 519-50.
- Teal, Francis (1996) "The Size and Sources of Economic Rents in a Developing Country Manufacturing Labour Market" *Economic Journal*, 106: 963-76.
- Trostel, Philip A. (1993) "The Effect of Taxation on Human Capital" *Journal of Political Economy*, 101: 327-50.
- _____, Carlo Perroni and Ian Walker (1998) "Are Investments in Human Capital Risky?" Grant Proposal to ESRC.
- Van Reenen, John (1996) "The Creation and Capture of Rents: Wages and Innovation in a Panel of UK Companies" *Quarterly Journal of Economics*, 111: 195-226.
- Warr, P. B., P. Jackson and M. Banks (1988) "Unemployment and Mental Health: Some British Studies" *Journal of Social Issues*, 44: 47-68.
- Weiss, Yoram and Reuben Gronau (1981) "Expected Interruptions in Labour Force Participation and Sex-Related Differences in Earnings Growth" *Review of Economic Studies*, 48: 607-19.
- Welch, Finis (1995) "Comment on *Myth and Measurement: The New Economics of the Minimum Wage*" *Industrial and Labor Relations Review*, 48: 842-9.
- Whelan, C. T. (1992) "The Role of Income, Life-Style Deprivation and Financial Strain in Mediating the Impact of Unemployment on Psychological Distress: Evidence from the Republic of Ireland" *Journal of Occupational and Organizational Psychology*, 65: 331-44.
- Winkelmann, L. and R. Winkelmann (1998) "Unemployment: Where Does it Hurt?" *Economica*, forthcoming.
- Woodford, M. (1992) "A Book Review, 'Seven Schools of Macroeconomic Thought', by E.S. Phelps" *Journal of Economic Dynamics and Control*, 16: 391-98.

Table 1
"Unhappiness" of Britons
in the Labour Force in 1991
 (from Clark and Oswald, 1994)

Labour Market Status	N	Mean Mental Distress*
Unemployed	522	2.98
Employee	4893	1.45
Self-employed	736	1.54

Note

*Mental distress is the GHS score -- a standard psychological measure. It is measured on a scale with a minimum of 0 and a maximum of 12. Calculating its mean imposes an implicit assumption of cardinality.

Table 2
Disaggregating "Unhappiness"
by Educational Attainment
 (from Clark and Oswald, 1994)

Education	N	Mental Distress*
High (HNC up to degree)		
In work	1612	1.48
Unemployed	86	3.44
Medium (GCSE up to A level)		
In work	2157	1.43
Unemployed	161	3.15
Low (less or no qualifications)		
In work	1848	1.43
Unemployed	273	2.70

Note

*Mental distress is the GHS score -- a standard psychological measure. It is measured on a scale with a minimum of 0 and a maximum of 12. Calculating its mean imposes an implicit assumption of cardinality.

Table 3
Patterns in Reported Happiness of
26,668 Americans, 1972-94
(from Di Tella, MacCulloch and Oswald, 1997)

	All Individuals	Unemployed Individuals
Not Too Happy	11.5%	29.6%
Pretty Happy	55.6	52.7
Very Happy	32.7	17.7

Table 4
Recent Microeconometric Tests for Profits
(or Quasi-Rents) in a Wage Equation

Study	Dep Var	Data on	N	FE?	$\hat{\alpha}$
Blanchflower et al. (1990)	Weekly Earnings	UK Establishments	1100	No	15%
Denny & Machin (1991)	Average Pay	UK Firms	2000	Yes	4
Christofides & Oswald (1992)	Contract Wage	Canadian Union Contracts	600	Yes	6
Currie & McConell (1992)	Average Pay	US Union Contracts	1300	Yes	-
Abowd & Lemieux (1993)	Contract Wage	Canadian Union Contracts	1100	Yes	90*
Hildreth & Oswald (1997)	Average Pay	UK Firms and Establishments	3300 & 400	Yes	16
Teal (1996)	Weekly Earnings	Ghanaian Establishments	700	No	100*
Van Reenen (1996)	Average Pay	UK Firms	2600	Yes	120*
Blanchflower et al. (1996)	Hourly Earnings	US Industry Profits/Worker	400	Yes	24
Estevao & Tevlin (1994)	Annual Earnings	US 4-digit Industries	1700	Yes	70*
Nickell & Nicolitsas (1994)	Average Pay	UK Firms	200	Yes	25
Smith (1996)	Basic Wage	UK Bargaining Units	400	Yes	4

Notes

N is the approximate sample size. FE refers to fixed effects included in the regression.

$\hat{\alpha}$ is the coefficient estimate on profit or quasi-rent variables in microeconomic wage equations. These estimates are expressed as the approximate percentage rise in wages induced by a move up the profit or quasi-rent distribution of four standard deviations. It can be thought of as the estimated spread of pay that is produced by rent-sharing.

*The profit (quasi-rent) variable is instrumented by something other than lagged values of independent variables.

Table 5
International Wage Curves
 (from Blanchflower and Oswald, 1994a)

Country	Period	Sample Size	Fixed Effects	Unemployment Elasticity of Pay	t
United States	1963-90	1730175	Yes	-.10	up to 25
Britain	1973-90	175500	Yes	-.08	6.23
Canada	1972-87	82739	Yes	-.09	6.10
South Korea	1971-86	1359387	Yes	-.04*	25.70
Austria	1986,89	1587	Some	-.09	1.59
Italy	1986-89	1041	Yes	-.10	0.63
Holland	1988-91	1867	Some	-.17	2.35
Switzerland	1987	645	No	-.12	3.60
Norway	1989-91	2599	Some	-.08	2.19
S. Ireland	1988-91	1363	No	-.36	1.92
Australia	1986	8429	No	-.19	5.80
Germany	1986-91	4629	Yes	-.13	1.75

Notes

The dependent variable is the logarithm of pay. The independent variable is the logarithm of the area unemployment rate (at various levels of disaggregation), except in the case denoted by *, where unemployment is measured at the industry level. In all equations, personal variables (gender, race, age, schooling, etc.) are included as controls.

Fixed effects refers to the inclusion of dummy variables for regions or industries in the regressions. A few countries' unemployment coefficients weaken when full regional dummies are added. This Table is only meant to be representative.

Table 6
Full-Time Equivalent Workers per Restaurant
Before and After the NJ Minimum Wage
Increase

(from Card and Krueger, 1995, Table 2.2)

	NJ	PA	Difference
Before	20.44 (0.51)	23.33 (1.35)	-2.89 (1.44)
After	21.03 (0.52)	21.17 (0.94)	-0.14 (1.07)
Change	0.59 (0.54)	-2.16 (1.25)	2.76 (1.36)

Note
Standard errors are in parentheses.

Table 7
Unemployment Rates and Education
 (from Nickell and Bell, 1995, Table 2a
 and Nickell and Bell, 1996, Table 1)

Country & Education Group	1971-82	1983-90	1991-93
Australia			
Low	8.3 ^a	11.1	13.6
High	3.5 ^a	4.2	5.6
Ratio	2.4	2.7	2.4
Canada			
Low	8.2 ^b	11.8 ^c	16.1
High	2.6 ^b	3.8 ^c	5.1
Ratio	3.2	3.1	3.1
Finland			
Low		7.4 ^c	14.8 ^d
High		1.4 ^c	4.7 ^d
Ratio		5.3	3.1
France			
Low	6.5 ^a	10.0 ^e	12.1
High	2.1 ^a	2.6 ^e	4.2
Ratio	3.1	3.8	2.9
Germany			
Low	6.4 ^f	13.0	10.7 ^d
High	1.7 ^f	3.1	2.2 ^d
Ratio	3.8	4.2	4.9
Italy [†]			
Low	4.6 ^f	7.3	7.5 ^d
High	12.2 ^f	13.1	12.5 ^d
Ratio	0.4	0.6	0.6
Netherlands [†]			
Low	7.0 ^g	14.0 ^h	9.9
High	3.2 ^g	5.7 ^h	5.0
Ratio	2.2	2.5	2.0

Notes

[†]For men and women. All other cases are for men only.

^a1979-82, ^b1975-79, ^c1984-90, ^d1991-92, ^e1983, 86-90, ^f1975-82, ^g1975, 77, 79, 81, ^h1983, 85, 90

Table 7 - Continued
Unemployment Rates and Education
 (from Nickell and Bell, 1995, Table 2a
 and Nickell and Bell, 1996, Table 1)

Country & Education Group	1971-82	1983-90	1991-93
New Zealand			
Low		8.8 ⁱ	16.3
High		2.2 ⁱ	6.0
Ratio		4.0	2.7
Norway			
Low	2.4 ^j	4.9	8.9 ^d
High	0.9 ^j	1.2	2.6 ^d
Ratio	2.7	4.3	3.5
Spain			
Low	10.6 ^f	19.6	20.0
High	6.2 ^f	9.9	9.0
Ratio	1.7	2.0	2.2
Sweden			
Low	2.9	3.3	6.9
High	1.0	1.1	2.8
Ratio	2.9	3.0	2.5
United Kingdom			
Low	7.5 ^k	15.9	17.1 ^d
High	2.4 ^k	4.4	6.2 ^d
Ratio	3.1	3.6	2.6
United States			
Low	7.8	11.3	11.0
High	2.0	2.4	3.0
Ratio	3.9	4.7	3.7

Notes

^d1991-92, ^f1975-82, ⁱ1987-90, ^j1972-82, ^k1973-82

Table 8
Unemployment Components and Education
 (from Mincer, 1993, Table 7.1)

Years of Education	<12	12	13-15	16+
Unemployment Rate ^a	7.0	4.1	3.3	1.9
Unemployment Incidence	9.5	6.4	4.7	3.5
Job Separation Rate	17.9	13.4	12.8	10.5
Unemployment Probability of Job Separators	53.2	48.6	37.8	33.2
Unemployment Duration 13.8 (in weeks)	12.1	11.6	11.0	
LF Participation ^b	92.1	97.0	96.4	98.2

Notes

All figures are in percentages.

^aBLS data, white men, age 25-54, 1979.

^bBLS data, white men, age 35-44, 1979.

All other rows: PSID data, white men, 11-25 years of work experience, 1976-81.

Table 9
Correlates with Countries'
Unemployment Rates

Variable	Explanatory power
Home-Ownership Rate	33%
Benefit Duration	28
Employer Coordination	26
Active Labour Market Policy	7
Union Coverage	6
Labour Standards	4
Union Coordination	3
Benefit Replacement Ratio	1
Union Density	1

Notes

These right-hand side numbers are R-squared values from univariate regressions on a cross-section of 20 countries in the 1990s.

Benefit duration and employer coordination are probably not well-measured.

Table 10
Unemployment and Home-Ownership Rates
by Country: Circa 1990

Country	Unemployment	Home Ownership
Austria	3.7%	54%
Belgium	8.1	65
Denmark	10.8	55
Finland	10.5	78
France	10.4	56
W. Germany	5.4	42
Ireland	14.8	76
Italy	8.2	68
Netherlands	7.0	45
Norway	5.5	60
Portugal	5.0	58
Spain	18.9	75
Sweden	4.4	43
Switzerland	2.3	28
UK	8.9	65
Canada	9.8	63
US	6.2	64
Japan	2.3	59
Australia	9.0	70
N. Zealand	8.9	71

Table 11
Regression to Explain the Log of
Unemployment Across Countries*
 (from Nickell, 1998, Table 2)

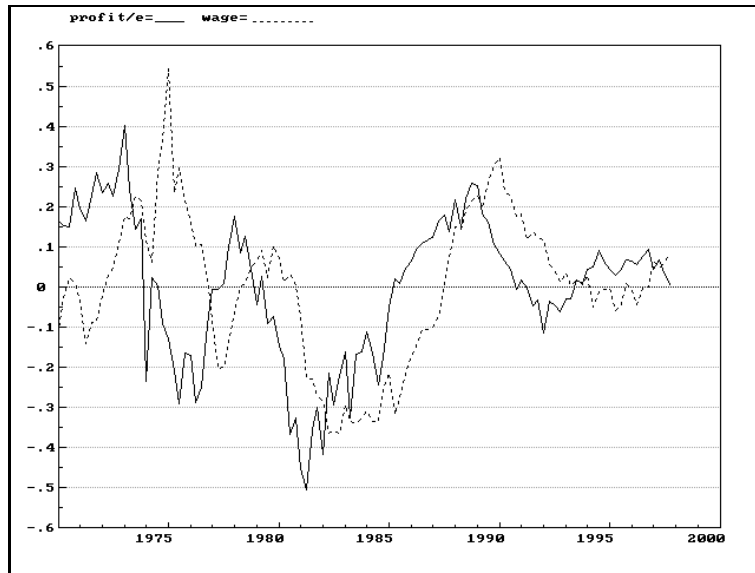
Independent Variable	Coefficient	t
Owner-Occupation Rate	0.013	2.6
Replacement Rate	0.013	3.4
Benefit Duration	0.10	2.2
Active Labour Policy	-0.02	3.3
Union Density	0.01	2.3
Union Coverage Index	0.38	2.7
Coordination	-0.43	6.1
Total Tax Rate	0.03	4.0
Change in Inflation	-0.21	2.2
Dummy for 1989-94	0.15	1.5
R-Squared = 0.82		
Hausman test of RE model Chi-sq = 6.35		

Note

*Estimated by random effects.

The sample is two observations (averages over 1983-88 and 1989-94) from 20 countries.

Figure 1
Time Series of Real Earnings
and Profits per Employee in UK
(from Brosius, 1998)



Note
profit/e (log of real gross trading profits
per employee) and wage (log of real wages,
salaries and forces pay) are derived after
regressing on a constant and a constant and
a trend.