

COMMENTS

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I. INTRODUCTION

The innovative paper by Bover *et al.* (1989) argues that house prices play an important role in the wage determination process in Great Britain.¹ The authors also suggest that it is the change in unemployment, rather than the level of unemployment, which has the dominant impact upon pay. If correct, these findings have important microeconomic and macroeconomic implications.

The authors' results emerge from a time-series analysis of data from the late 1950's to the mid 1980's. The large group of independent variables means that the number of degrees of freedom is unusually small, and this makes it difficult to draw reliable inferences.

Our purpose in this paper is to use cross-section methods to investigate the ideas explored by Bover *et al.*² We use the new British Social Attitude Survey series of 1983–86, which provide information, for a recent and interesting period, on a sample of almost four thousand British workers. The Surveys record the earnings and the personal and workplace characteristics of the individuals. We graft on to this data set external information on regional unemployment and house prices.

The Appendix describes the data. A more detailed discussion, and further analysis, is available in Blanchflower (1988). That paper documents the effects on wages of many variables which, because they are of marginal relevance to the case proposed by Bover *et al.* (1989), are included in later regressions but not reported or discussed here.

II. EMPIRICAL ANALYSIS

Bover *et al.* explore a wide range of issues and we do not attempt to comment upon them all. Their conclusions about the influence of trade union power, for example, are not particularly controversial (see the microeconomic evidence in Stewart (1983), Blanchflower (1984, 1986) and Blanchflower,

¹ Carruth and Oswald (1989), following Bover *et al.*, also find a house price variable to be significant — with an elasticity of approximately 0.2 — in a time-series British real wage equation. Their specification includes a variable for profit per employee.

² The analysis assumes that regions have their own distinct labour markets. Bover *et al.* make a similar assumption.

Oswald and Garrett (1988), and the large US literature surveyed in Lewis (1985)). We also here leave to one side the interesting question of how measures of regional dispersion — of house prices or excess demand — affect the equilibrium wage. The exact role of labour mobility in the pay determination process is also ignored.

This still leaves many questions unanswered, and four are of particular interest. First, do wages respond to the lagged level of house prices?³ Second, is it primarily rises in the unemployment rate, rather than high levels of unemployment, which dampen wage pressure? Third, how large an impact does the level of unemployment have upon pay? Fourth, is it the case, as Nickell (1987) and Layard and Nickell (1988) have argued, that the existence of a high proportion of long-term unemployed increases pressure on real wages? To examine these questions we estimate wage equations on individual data and use regional variables to capture the effects of the price of housing and of unemployment.

Table 1 gives the results. The dependent variable is annual earnings (a switch to wages per hour makes no substantial difference). The unemployment and house price variables are each defined for 11 regions in each of four years.

Equation (1) includes a set of standard human capital and other personal and workplace control variables, plus the natural logarithm of the unemployment rate in the sampled individual's geographical region. The equation also includes a dummy variable for London. The unemployment rate enters with an elasticity of approximately -0.1 , which is close to that estimated both in many recent studies (see the summary in Oswald (1986) and the new results in Nickell and Wadhvani (1987) and Blanchflower, Oswald and Garrett (1988)) and in some of Bover *et al.*'s results. However, the addition of a full set of regional dummies, as in equation (7), eliminates this finding. It seems that unemployment works successfully in equation (1) because the unexplained inter-regional pay structure is negatively correlated with the inter-regional unemployment structure. Regional fixed effects apparently dominate.⁴

Equations (5) and (8) report the same exercise for the price of housing. The (lagged) house price is highly significant in equation (5) and has an elasticity close to the figure — after appropriate adjustment — estimated by Bover *et al.* This provides some corroborative evidence for the authors' central argument. Nevertheless, the result in equation (5) is not robust to the insertion of regional dummy variables (see equation (8)). As with the unemployment variable, all that can definitely be concluded is that the geographical structure of wages is well proxied by the geographical structure of house prices. Once again, regional fixed effects are important.

³ To follow Bover *et al.* we use a two year lag on house prices. The results were similar when current house prices were used.

⁴ Equation (4) in Table 1 includes the regional dummy variables without any unemployment or house price variables.

Given the apparent importance of regional characteristics, it is appropriate to try to disentangle the effects of unemployment and house prices from the underlying regional influences. Unfortunately, it is difficult to speculate on the relationship between regional wage differentials and these unemployment and house price variables. The reason for this is that, despite having a sample of around 4,000 individuals, we only have 44 regional observation points (11 regions \times four years). Moreover, house prices and unemployment are highly correlated across these data points, which probably explains the instability in the pattern, and changes in the ranking, of the regional dummies between equations (4), (7) and (8). To extend the results in this paper will require a greater regional disaggregation or more years of data or both. It would be especially useful to have data in which there is a greater time variation in unemployment.

The effects of changes in unemployment (using the three year change favoured by Bover *et al.*), and of the level of long-term unemployment, are shown in equations (2) and (3). As the Table reveals, neither contributes anything to the explanatory power of this wage equation. These negative findings are of interest because much recent discussion, especially about the supposed importance of the rate of change of unemployment, has been exclusively theoretical. It is worth noting that Blackaby and Manning (1988) have found significant negative effects from unemployment, and positive effects from long-term unemployment, in their analysis of wage data from the *GHS*.⁵

Equation (6) combines all four of the regional variables. House prices, interestingly, is the only one to come through strongly. However, the evident importance of the regional fixed effect structure suggests that it is difficult to assess the variable's exact importance.

III. CONCLUSIONS

The object of this short paper has been to use cross-section data to assess some of the arguments of Bover *et al.* (1989). On one point our results provide independent confirmation of their main conclusion. House prices enter strongly in an earnings equation for Britain. The authors' view that the price of housing plays a role in wage formation may be justified.⁶

When entered on its own, the level of unemployment is negative and significant, and has an elasticity close to -0.1 . However, like the result for

⁵ Blackaby and Manning (1988) enter three regional variables — unemployment, long-term unemployment and consumer prices including housing costs. All three are significant. As they have only ten regional observations in their cross-section data, this is a remarkable result, and we wonder about the stability of the authors' estimates. We should like to acknowledge very helpful discussions with David Blackaby about these issues. Clearly a lot more research is needed before we can disentangle the many possible regional influences on wages.

⁶ At the least, the results suggest that the price of housing plays a role in the wage transmission mechanism.

TABLE 1
Cross-section Earnings Equations for British Individuals, Pooled 1983-86

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Regional Variables</i>								
Current unemployment	-0.1176 (3.53)	-0.1211 (3.57)	-0.1383 (2.12)			0.1239 (1.42)	0.5272 (1.21)	
3 yr. unemployment change		-0.0549 (0.55)				-0.0660 (0.66)		
Long-term unemployment			0.0012 (0.37)			0.0000 (0.01)		
House prices (lagged 2 yrs.)					0.2330 (5.36)	0.3777 (4.50)		-0.1097 (0.26)
<i>Regional Dummies</i>								
North								
North West				-0.0943 (2.79)			-0.4392 (1.54)	-0.1495 (0.71)
Yorkshire and Humberside				-0.0874 (3.22)			-0.3769 (1.57)	-0.1309 (0.79)
West Midlands				-0.1497 (5.10)			-0.3761 (1.99)	-0.2036 (0.99)
East Midlands				-0.0816 (2.90)			-0.3284 (1.60)	-0.1224 (0.78)
				-0.1063 (3.34)			-0.2530 (2.03)	-0.1530 (0.85)

Wales				-0.1059 (2.72)				-0.3870 (1.65)	-0.1527 (0.84)
Scotland				-0.0625 (2.12)				-0.3305 (1.48)	-0.0985 (0.71)
East Anglia				-0.1125 (3.21)				-0.1388 (3.44)	-0.1420 (1.22)
South West				-0.0555 (2.01)				-0.1361 (1.89)	-0.0756 (0.94)
London	0.1260 (5.28)	0.1279 (5.31)	0.1263 (5.29)	0.0815 (3.03)	0.0786 (2.97)	0.0643 (2.30)	0.0396 (0.90)	0.0854 (2.79)	0.0854 (2.79)
Adjusted R^2	0.66868	0.66862	0.66860	0.66998	0.67011	0.67023	0.67002	0.66990	0.66990
F	218.504	212.404	212.390	179.083	219.913	202.745	175.069	174.971	174.971
Degrees of freedom	3,737	3,736	3,736	3,729	3,737	3,734	3,728	3,728	3,728
No. of observations	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773

Variables not reported above

Control variables included in all equations were as follows: (1) marital status (2) full-time/part-time (3) manual/non-manual (4) redundancy expected (5) three year dummies (6) number of workers in the plant expected to rise/fall/remain the same over next 12 months (7) union member (8) union recognition at workplace (9) private schooling (10) supervisor (11) ever unemployed over preceding five years (12) age and age squared (13) years of schooling (13) sex (14) ten industry dummies.

Dependent variable

Group annual earnings before deduction of income tax and National Insurance. Grouped data with open-ends across 13 intervals. Mid-points used for estimation.

Source: British Social Attitudes Surveys, 1983-86.

house prices, statistical significance disappears once regional dummies are included. All that can safely be concluded, in our view, is that the wage structure is highly correlated with (a) the house price structure and (b) the unemployment structure.⁷

Two potentially important, if negative, findings have also emerged from the analysis. Neither long-term unemployment nor the rate of change of unemployment appears to shape British wage rates. On the latter point we find ourselves in disagreement with Bover *et al.* (1989).

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APPENDIX

British Social Attitudes Survey Series, 1983-86

This series of surveys, core-funded by the Sainsbury Family Trust, was designed to chart movements in a wide range of social attitudes in Britain and is similar to the General Social Survey carried out by NORC in the United States. The data were collected by Social and Community Planning (SCPR) and derive from annual cross-sectional surveys from a representative sample of adults aged 18 or over living in private households in Great Britain whose addresses were on the electoral register. The first three surveys involved around 1,800 adults; the numbers were increased to 3,000 in 1986.

The sampling in each year involved a stratified multi-stage design with four separate stages of selection. First, in each year approximately 120 (150 in 1986) parliamentary constituencies were selected, with probability of selection proportionate to size of electorate in the constituency. At the next stage a similar number of polling districts were chosen also with probability of selection proportionate to the size of the electorate. Then, thirty addresses were selected at a fixed interval on the electoral register. Finally, at each sampled address the interviewer selected one respondent using a random selection procedure (a Kish grid). The majority of sample errors for each survey lie in the range 1.0 to 1.5; errors for subgroups would be larger. For further details of the survey designs, non-responses etc. see *British Social Attitudes Technical Report, 1984, 1985, 1986, 1987*.

Variable Definitions

Unemployment Rate — natural logarithm of the total unemployment rate in the Standard Region. Source: *Employment Gazette* (various issues), *Economic Trends* (various issues).

⁷ A comparison of the adjusted R^2 s in equations (1) and (5) in Table 1 shows that house prices have slightly more explanatory power than unemployment.

- Long-term Unemployment — percentage of the unemployed in the standard Region continuously unemployed for at least 12 months. Source: as above.
- House Prices — natural logarithm of the average dwelling price (all dwellings) in the Standard Region.
Source: *Housing and Construction Statistics, 1976-86*.

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Olympia Bover, John Muellbauer and Anthony Murphy (Bover *et al.*) have written an exciting paper of considerable potential importance for how economists model unemployment and wage determination. It contains a variety of fresh insights appertaining not only to linkages between the housing and labour markets, but also to more general questions in the modelling of wages and unemployment.

The paper may be divided into three parts. First, wage determination in a sectoral context is discussed in order to link recent studies of aggregate wages with the ideas presented here concerning the role of regional structure of the housing market, giving particular emphasis to the owner occupied market. Second, these ideas are evaluated together with extensions of recent work by Nickell (1987) and Layard and Nickell (1986), in jointly estimated models of aggregate wages and unemployment. Finally, the various parts of the argument are drawn together to offer a view of how the interaction of housing and labour markets critically influences wages and the regional mis-allocation of labour. These comments are organized in the same order.

Model and Empirical Implementation

The primary contention is that future study of aggregate manual wage determination and the $U-V$ relationship should pay close attention to regional considerations. In particular, by overlooking the role of the owner-occupied housing market, previous studies omit a potentially critical influence upon regional mobility, the regional allocation of manual labour, and the cost of living, which in turn are held to influence wages. Earlier studies of housing and regional labour markets have focussed upon the roles of the public and private rental sectors in rigidifying the regional distribution of manual workers — for example, Hughes and McCormick (1981) (1987), Minford *et al.* (1987) — and the crucial roles of government policy (council house mobility policy and private sector rent controls) in creating regional unemployment, inflationary wage pressures in Southern England and large welfare losses in the labour market. Bover *et al.* aim to persuade that to understand unemployment, wages, and the regional dispersion of unemployment (i) the influence of owner-occupied house prices on inter-regional mobility may also be considerable, and that (ii) government policy in the owner-occupied sector has altered relative regional house prices and their volatility, and thus creates large welfare losses in the labour market that substantially strengthen the case for policy reform towards owner-occupied housing.

The model supporting the empirical work is drawn from Hansen (1970). Wages in each regional market are assumed to be determined by excess demand, and a combination of other factors. Then in aggregate wages are explained as a function of aggregate unemployment, a combination of other

factors for each region, and the regional dispersion of excess demands. This is then augmented with the sectoral dispersion of *changes* in excess demands which are suggested by insider-outsider models. A problem with this approach for the ideas that Bover *et al.* wish to portray is that it is static and omits consideration of labour mobility between sectors, so that policies which influence mobility make an appearance only in an aggregate wage equation and as no more than proxies for the determinants of the regional dispersion of excess labour demand. In that the sectoral model provided is therefore fairly remote from the empirical innovations in the paper, it does not offer help in steering Bover *et al.* through the difficult job of selecting an appropriate characterization of the mobility reducing effect of relative regional house prices. Whilst Bover *et al.* clearly recognize the difficulties of specifying mismatch or influences upon it — they argue that the measures of mismatch adopted by Layard and Nickell (1985, 1986) and Nickell (1986) might be better regarded as measures of the change in mismatch — there is little justification given for the choice of the crucial relative regional house price/earnings variable, *RD*. (There is, however, a thorough discussion of its alternative interpretations.) For example, *RD* is formed by comparing house price/earnings ratio in the South East with that in the UK for a single year, whereas depending on the nature of the barrier being hypothesized, forming a weighted average over several periods might be more appropriate.

It would be worthwhile for the authors to explicitly spell out the model they have in mind, together with the implications for the specification of the 'barrier' to mobility. If capital markets are assumed to be perfect then agents will presumably view the 'barrier' as the cost of supporting an increased price of housing services and form an estimate of the long run mean differential in regional house prices. In this case (a) the amended *RD* variable will fluctuate little and follow whatever underlying trend exists; (b) cyclical relative regional house price movements would not be expected to have a separate influence on the housing costs of migrating, which is given by long run relative regional house prices. If, perhaps more reasonably, capital markets are assumed to be imperfect, then fluctuations in the willingness of financial institutions to lend high income multiples appear as relevant to determining the 'barriers' to entering the Southern housing market as relative house price differentials. Further, if the proportion of equity held by owner-occupiers has varied much over time then emphasis on capital market imperfections in the form of borrowing limits suggests that the ratio of mortgage levels required in different regions to support a given quality of accommodation might be preferred as a measure of the barrier to mobility.

Whilst the motivation for this paper is constructed at the sectoral level, the empirical work concerns aggregate wage and unemployment equations. Yet there are several crucial implications of the work that could be more persuasively tested with readily available regional data. For example, if (i) the *mobility* interpretation of relative regional house prices, *RD*, and (ii) the *cost push* interpretation of *HPW*, the house price/wage ratio, are both correct

then in a regional wage equation controlling for regional unemployment and the aggregate price level we might expect (i) *RD* to be insignificant (it influences wages through unemployment) whereas (ii) *HPW* should play a role. It would have been perhaps more natural to develop the ideas here using regional data, summing to obtain implications for aggregate wages, and also a more exacting test of the underlying ideas offered to interpret the findings.

The model (as opposed to the empirical implementation) makes little distinction between the markets for manual and non-manual labour: the effects of monetary expansion on South East house prices, mobility, labour shortages, cost push and wage levels are couched in terms of the regional labour market as an entirety rather than for either manual or non-manuals. Thus the analysis sets aside the linkages between relative regional house prices and 'gentrification', in which expansion in the South East attracts non-manual workers, despite rising house prices, and encourages manual workers to realise their capital gains. Insofar as percentage capital gains in housing have (recently) been greatest in the South East for manual worker accommodation, and housing wealth constitutes a larger fraction of manual workers' total assets, then we might expect a particularly large out-migration response from (predominantly older) manual workers when South East house prices increase. This potential compositional effect, whereby the housing needs of the expanding non-manual market are met by out-migration from older manual workers is I believe of major interest since it is reinforced by the regional flexibility of non-manual workers earnings and the contrasting rigidity of manual worker wages across regions. (The ratio of average non-manual earnings before overtime in the South East to that in the rest of the country is greater for non-manuals (1.145) in 1986 than for manuals (1.049). In addition, between 1979 and 1986, this ratio for non-manuals rose from 1.076 to 1.145, whereas for manuals from 1.014 to only 1.049). If non-manual wage rates can rise locally in response to a local demand shock, but manual worker wage rates cannot, then the labour force in expanding regions will be distorted by a socially excessive proportion of non-manuals. In exploring links between fluctuations in the price of owner-occupied housing and regional labour markets. I would probably wish to stress how these compositional effects on the regional labour force — rather than the notion of aggregate regional labour shortages — and the extent to which the working of the council house system powerfully reinforces the resulting occupational biases.

In this view changes in the relative price of housing in the South East provide incentives for workers approaching retirement and those already retired to leave the region — releasing housing for young labour market participants moving into the region. Thus rather than rising house prices acting to choke off the available labour supply, a model in which the price of housing reflects the balance of demand and supply of housing in the region suggests that rising prices will be acting in the short run to increase the activity rate in the region, so that the local labour supply may increase without there being a net inflow of persons into the region. (Indeed, evidence

of total population net outflows without analysis of whether these are net flows of those in the workforce is predicted to be misleading.) In the longer run rising relative house prices in a region will increase building and encourage a more intensive use of housing space.

Empirical Implementation

The paper provides a thorough and interesting analysis of the aggregate wage literature, and suggests that changes in unemployment appear more important than its level. However, the considerable problems of choosing an appropriate variable to capture the innovative housing influence in the wage equation (as discussed above) seemingly resurface with the adoption of *non-manual* earnings in the relative regional house price/earnings variable, *RD*, which aims to capture barriers to mobility in an expression for *manual* worker wages. The authors argument for using non-manual wages is that it is 'more representative of the upper part of the earnings distribution than its manual equivalent'. Whilst this is true, it does not make it easier to view *RD* as the relevant barrier to the mobility of *manual* workers, and since non-manual wages show more regional flexibility than manual wages, it makes it harder to accept the authors' interpretation that the influence of *RD* in the model does not result from it being a proxy for local demand shocks. Since *RD* is lagged, simultaneously is not an obstacle to the use of manual wages.

More broadly on the way in which housing variables should be introduced to the model, I was also unclear whether, once measures of mismatch and changes in mismatch are included in the wage equation, we should also expect *one* of the determinants of mismatch — namely the housing variables — to exercise an incremental effect. There would appear a case for adopting a recursive structure in which *measures* of mismatch (and their changes) are included in the wage equation, and the *determinants* of mismatch including housing mobility variables (*RD*, *HPW*, *MOBR*) are introduced in the unemployment equation. While the mismatch variable used in the wage equation is an industrial measure, presumably the determinants of regional mobility are held to be an influence upon it.

The construction of a variable to capture how house tenure and Rent Acts have influenced mobility, and thereby wages, (*MOBR*) is thoughtfully undertaken but I am concerned that emphasis on variations in tenure proportions, whilst omitting factors behind variations over time in the barriers to mobility within the council sector may be misplaced. Furthermore there is evidence that the interpretation of *MOBR* in the *U-V* equation may deserve reconsideration. Not only may tenure affect aggregate unemployment via its effect on mobility and mismatch, there is also the possibility that disregarding mobility, the pattern of incentives to be unemployed differs between tenures. There is evidence that workers with mortgages have lower unemployment rates, *ceteris paribus*, than both owners-outright and tenants, who share similar unemployment rates (McCormick (1983), Murphy (1985)) within

socio-economic groups. It would be interesting to know whether the share of workers with mortgages enters significantly with a negative sign in the unemployment equation, and whether with its high weight on owner-occupation, *MOBR* is picking up some of this effect.

Overview

In gathering together their view of the housing/labour market interaction, Bover *et al.* offer an interesting picture of how migration from the South East varies over cycle: out-migration falls as relative house prices in the South East rise and then picks-up as this ratio peaks; in-migration is choked off by rising South East house prices and the credit constraint. Does this fit the facts? Between 1982 and 1985 house prices in the South East rose relative to the rest of the country by 19 percent (Nationwide data) for skilled manual workers' accommodation and slightly less for others. Labour Force Survey data for the years 1983-86 (thereby allowing for a year lag) show *out-migration* percentage rates little altered for HoH manuals, from 0.747, 0.655, 0.880, to 0.801 in 1986. (Thus in 1985 8.8 per 1,000 manual HoH's migrated from the South East). In-migration rates were 0.431, 0.504, 0.622, 0.546 over the same years — which contrary to prediction is seemingly an *upward* trend. Thus net migration from the South East is positive but shows no significant increase, 1983-86. Whilst these are total rates rather than marginal effects of house prices upon migration, it hardly appears that rising net out-migration accompanied the rise in relative southern house prices, on a scale which may have contributed to the tight SE manual labour market and wage inflation. The South East was *throughout this period* (not just after the house prices had increased) a net supplier of HoH manual labour to the rest of the country, which is of course deeply worrying given its comparative low unemployment, and the *accumulation* of net out-migration for several years may well be important in understanding aggregate manual wage determination. For this reason I considered the discovery that the South East was a net exporter of the manual labour force in the mid 1980's most interesting (see, Hughes and McCormick (1987)) so that it will be a significant finding if — contrary to the suggestion in this paragraph — the econometric evidence supports the Bover *et al.* hypothesis that fluctuations in relative regional house prices have an economically important effect on fluctuations in net migration of manual labour from the South East. It will be particularly useful if the special position of the GLC can be integrated into the account of this migratory process.

The chief case against rental sector policy is that it provides a subsidy, which in practice is region-specific, and is predominantly allocated to those regions in which the manufacturing/extraction industries are concentrated. These are the areas where redundancies are greatest and the service sector has the smallest base. Thus despite the (remarkable) willingness of council tenants to seriously consider migrating on a scale comparable with others, the

rationing procedures which underpin the difficulty of regionally transferring the subsidy, frustrate this intention. If policy intervention ends, administered rationing is replaced by the long run regional price differential for rental housing. The case against (distorting) policy in the owner-occupied sector is somewhat different. Reform will not eliminate regional house price differences, nor their fluctuations: optimal land use policy requires that both differential congestion and unequal local amenity value be reflected in unequal land prices. Welfare gains in the labour market arise because the allocation of labour is changed by the altered regional prices of housing and their relative volatility. It is not easy to assess the extent of these changes of prices and associated welfare gains, and a further piece of work assessing the impact of housing policy on relative regional house prices and their cyclicity would be welcome.

My own view is that while the reform of both sectors is desirable, reform of the council sector is both a more promising and a less risky way of reducing the welfare losses associated with regional labour market imbalance. More promising because introducing non-distorting prices in both rental and owner-occupied markets would most probably increase the regional mobility of tenants relative to owner-occupiers by a large multiple, to exceed that of owners in a steady state, as is conventional. Council reform by itself is therefore likely to yield a greater proportionate mobility increase than owner-occupier reforms. Secondly, quantity rationing in the rental market has probably distorted the regional allocation of rental accommodation and thus that of manual workers to a considerable degree, as the prosperous South has declined to build council accommodation and share the local housing subsidy cost of low income manual workers presently resident in the North. Council sector reform is less risky, because a reform of the owner-occupier sector that reduces relative house prices in the South (and this is presumably the assumption) may, I fear, encourage migration of 'scarce' non-manual workers to the South more than that of manuals. Given the low unemployment of non-manuals in 'depressed areas' and their high relative migration rates this may further unhinge balanced regional development efforts.

It is important that Bover *et al.* provide at some point a more comprehensive picture of the joint determination of regional wages, and house prices, particularly given the attention in policy circles to their robust finding that relative house prices in the South East act as a lead indicator for wage inflation. My own speculation is that fluctuations in monetary stance may exercise a greater influence on consumer demand in the South East — given the weight of borrowing in the region — and thereby on the local demand for labour and housing. Thus with a fixed housing supply in the short run, house prices in the South East rise as (i) local workers are offered more overtime, fewer redundancies and rising wages, and (ii) immigrants attempt to enter. In this process rising relative house prices gradually *increase* the local labour supply due to both the increase in local activity rates (described above) as young immigrants replace old emigrants, and to the longer run increase in

building and rental accommodation. Thus far from being a cause of labour shortages, rising house prices are symptom of rising local demand and labour shortages. Given the institutional arrangements rising wages in the South East manual labour market then lead to higher wages in other regions.

While I am not yet convinced that the ideas advanced by Bover *et al.* add very significantly to the already strong case for reform in the owner-occupied sector, this paper contains much that will be of interest to those modelling aggregate wages and may well be of long run importance for bringing regional considerations explicitly into the UK macro-economic spotlight, forcing future work on wage determination to look more critically at the implications and causes of quite diverse regional manual labour markets.

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Patrick Minford

To do this interesting paper full justice would be a long and complicated undertaking for which the editors have no room even if it could be delivered in the time available. So this comment will be selective and brief.

The two equations, for real product wages adjusted for 'productivity' and for unemployment, vacancies, are allegedly structural forms estimated over less than 30 years of annual data. The results reported use a variety of con-

*I am grateful to the authors for their response to which I have reacted in the final version of my comments.

structured variables (moving averaged, differenced i times, adjusted for 'bias') which are obviously the product of substantial experimentation (or unkindly, data-mining). With so few degrees of freedom, one is entitled to be sceptical about the robustness of estimated effects out of sample, even though within sample they pass all the state-of-the-art hurdles. I am particularly suspicious of the many dynamic effects they come up with, as experience, not to speak of the Lucas critique to which they are extremely vulnerable, indicates they are not robust out of sample.

The new theory introduced by the authors, Bover *et al.*, is sketchy and often appears to be made up, in a rather confusing way, after the data has 'spoken'; this is given away by frequent phrases like 'we interpret this to be...' However, it originates with the Layard-Nickell approach; the innovation is on housing and mobility. Before turning to that major focus, let me welcome the discussion of the union mark-up series. But the use of a two-year moving average plus one year lag on union density is still less than convincing that union settlements are being held back by the fall in unionization; the variable only turns for the last two or three years of the sample.

As for benefits, the authors attempt to integrate the variable in a serious way, which is welcome; but they later drop it, even though they acknowledge its theoretical role — a dubious practice. Following Layard and Nickell, they use the benefit-wage ratio rather than real benefits even though the former is endogenous; containing as it does the dependent variable, its coefficient is *prima facie* downward biased. Instrumental variables may well not cure this as any good instruments correlated with the ratio are also likely to be correlated with wages and with the equation error, which itself contains a ragbag of 'bargaining' determinants of wages. Furthermore should the coefficient on real benefits tend to unity, the coefficient on the ratio will tend towards infinity. I have never understood why all these authors are so determined not to use real benefits, such a less problematic alternative.

Their use of the capital-labour force ratio to proxy productivity also as in Layard-Nickell falls foul of its endogeneity; capital-intensiveness is as Muellbauer has carefully pointed out in his work on productivity endogenously affected by wages as firms ride up the labour marginal product curve.

Finally, the remarks about support for 'hysteresis' need to be carefully interpreted. The authors find dynamic effects, from the rate of change of unemployment, on real wages but these only produce temporary effects and in the absence of dynamic simulations for the full model it is hard to see just when even these amount to. The authors say they follow the Layard-Nickell model otherwise and therefore their model presumably has a natural rate solution, though what it is and how it behaves is not revealed by this paper. By hysteresis is usually meant that the equilibrium unemployment rate responds to a temporary shock — i.e. that unemployment has a random walk element; but this is not the case here. The term has also been used — e.g. by Layard and Nickell — in the weaker sense, presumably intended here, that it draws out the lags before unemployment reaches an equilibrium independent of

temporary shocks; but even that as just noted is not demonstrated in this paper. This incidentally illustrates one of the frustrations of reading this paper — that frequent claims are made about overall model properties without the overall model ever being presented to the reader.

The focus though is on housing and mobility. The core of the theoretical innovation here is clear to me at least, as I set it out in a full general equilibrium context in the course of my own work on housing with Michael Peel and Paul Ashton (the authors kindly cite our book, *The Housing Morass*, and for a fuller more technical account see *Oxford Economic Papers*, September 1988). The point is that any regional shift of supply or demand will be likely to produce a rise in *national* real wages and unemployment in the presence of (1) labour immobility induced by housing market distortion and (2) downward regional real wage rigidity. But this does require both these elements, together with a good story for each.

This is not the place to defend our empirical work against the authors' reply; my point was merely that whatever its faults our work does set out a coherent theoretical framework suitable for their paper but not spelt out in it. It does, too, underpin their results for *RD*, as already argued. It is certainly true, as the authors concede, that our two models have similar long run implications about the rental housing sector and its effects on mobility and unemployment.

For (1), Bover *et al.* rightly use the Rent Act and council housing allocation arguments to underpin the distortion in rented housing; the distortion exists because the marginal rent paid (e.g. by an inward migrant) is higher than the average paid by sitting tenants. The work of Hughes and McCormick cited here shows that renters are as this would suggest highly immobile across regions.

As for (2), benefits and union power (regionally variable) are the natural rationale, but only implicitly used by Bover *et al.* The lack of explicit treatment is deeply regrettable since for policy purposes this aspect is crucial and usually overlooked by those likely to welcome this paper's results.

Given these assumptions, the paper's results, which are that both real wages and unemployment respond to regional house price disparity (a proxy in this theory for regional demand-supply shifts) and to an index of housing tenure, are quite intelligible. They are to be welcomed as a little bit of extra evidence supporting the above regional model.

The effect of the general house price index on wages cannot be explained in this way and the authors suggest that it is a major part of the 'wedge' between consumer and product prices. They may also be proxying general effects on aggregate demand not captured by unemployment. The coefficient seems, at 0.2, to be implausibly high for a wedge effect (when housing costs account for 13 percent of the cost of living and are already partially included in the final expenditure deflator used for product prices).

It is however in the wider interpretation of their results that the authors are both most free and most at variance with an intelligible theory. For they turn

from the solid ground of the rented market's distortions to denounce the lack of mobility in the owner-occupied sector. Yet any such lack of mobility in this sector is not due to a cross-regional distortion; marginal and average house prices are equal, you pay the same for a house as migrant or local (hence all the fuss in North Wales). The lack of mobility of people is of course the result of planning restrictions in the SE particularly. But this of itself will not produce regional disparities in unemployment and real consumption wages, because the higher house/land prices in the SE for example drive business North; business moves in response to cost differentials, until real consumption wages are equated and there is no further incentive for people to try to move (so driving house prices up further). The authors make a lot of play with 'extrapolative' expectations and 'short term macroeconomic damage' in their response; but like the rest of their dynamics, the evidence for either is quite unconvincing. And in any case the latter claim is opaque because they never simulate the model for the macroeconomy.

They also argue that tax relief on home ownership creates a distortion *vis-a-vis* the rented sector. There is certainly an element of truth in this but it should not be exaggerated; renters too can charge mortgage interest against tax just as can the home-owner, they can also arrange to minimize capital gains tax, and of course neither poll tax nor rates discriminate between renting and owning. The Holmans claim, quoted here, that the treatment of home ownership equals or dominates the Rent Acts as the cause of decline in the private rented sector is hardly supported by the size of the tax advantage applied to such estimated price elasticities for housing as are available (see the estimates in our *The Housing Morass*, chapter 1).

But whatever its size this effect does not create a cross-region distortion affecting the labour market, as do the Rent Acts; anyone induced into home ownership out of private rent will be as mobile in the long run as before. Consistently enough, the paper finds no home tax treatment effect in its two labour market equations; the sole bit of evidence superficially related to home-ownership is the two house price variables. Both these can be explained as above by a defensible theory; the rest of the Meullbauer policy story is neither theoretically nor empirically supported (which is not to say that 'no significant reform' is desirable, as the authors describe my position). It mars an otherwise stimulating empirical investigation.

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Despite a marked slowdown in consumer price inflation and a high level of unemployment, house price and wage inflation have remained high in the UK during the 1980's. The paper by Bover *et al.* represents a major contribution to our understanding of these phenomena, particularly the effect of regional

house price differentials. However, the theoretical basis for the *national* house price effect is unclear. The cyclical nature of this variable means that it could be reflecting the effect of price expectations, profitability or other variables missing from the model.

The Theoretical Motivation

Bover *et al.* distinguish the effect of changes in the national house price to earnings ratio (*HP*) from the effect of regional differentials (*RD*) in house prices. They provide an extensive theoretical discussion of the *RD* effect, but simply introduce *HP* in the empirical section as a 'conventional wedge variable'. The implication is that this is similar to variables such as import prices which increase the supply price of labour relative to the demand price in the original Nickell-Layard (*NL*) model of unemployment.

However the *HP* variable does not fit this description because houses are produced domestically. The price of housing thus enters the producer price index as well as the consumer price index. We would not in general expect a change in the relative price of a domestically produced good to drive a wedge between consumer and producer prices or to affect the equilibrium real wage or the NAIRU.

The openness of the economy means that the consumption and production weights may not coincide exactly. But there is no reason to think that the weight of housing in consumption should exceed its weight in production in equilibrium. If anything the opposite is true.¹ In practice, user costs are typically low relative to the rest of personal expenditure. In fact as Bover *et al.* note, user costs have frequently been negative.

Bover *et al.* employ a user cost variable (*UCW*) in their latest specification (Table 2(e)). This attracts a very low coefficient, supporting the view that nationwide, user costs do not seriously affect wage bargaining. The *HP* variable remains very significant, suggesting that the other components of *UCW*, interest rates and house price inflation, could be mis-specified.² But

¹ Suppose that *S* represents the real value of the housing stock. This will increase over time at a rate $(n+p)$ where (n) is the net investment rate and (p) the real rate of price appreciation. If (d) is the rate of physical depreciation then the weight of gross housing investment in *GDP* output (*Y*) is $(n+d)S/Y$. If (r) is the real interest rate measured in terms of consumer prices then $(r-p)$ is the real interest rate in the housing market. The weight of housing (appropriately measured in terms of the user cost) in expenditure is thus $(r-p+d)S/Y$. Thus the production and consumption weights are equal if $(n+p)$, (the growth rate of *S*) is equal to the real interest rate (r) . The latter will equal the growth rate of *Y* in the steady state if the monetary authorities are optimizing consumption per head. But, in practice, *S* tends to grow faster than *Y* so the production weight will tend to exceed the consumption weight.

² For example it is highly likely that credit controls pushed the shadow interest rate well above the observed interest rate during the 1960's and 1970's. Arguably the experience of the 1980's can be explained by the liberalization of the credit market, which initially had the effect of reducing the shadow interest rate, and hence user costs. This was then neutralized by a rise in *HP*. If this explanation is correct, both the *UCW* and *HP* variables are misleading indicators of user cost pressures on wages.

even on this interpretation, the elasticity of real wages with respect to house price, at 0.38, seems hard to justify a priori.

John Muellbauer and his colleagues provide three reasons for including the *regional* difference variable in the real wage equation: (i) as a proxy for regionally differentiated demands shocks, (ii) as a disincentive to inter-regional migration, and (iii) as a proxy for regional differences in the wedge. I find the first two of these arguments very persuasive, consistent with Bover *et al.*'s explanation of the u, v relationship. The second also squares with the microeconomic evidence on mobility and with Muellbauer's more recent work on inter-regional migration. However, I find the third argument unconvincing: if there is a non-linear interaction effect between 'wedge' variables and excess demand, then this should be evident at the aggregate as well as the micro level.

Econometric Results

House price variables (together with equity prices and the money supply) have provided a good early warning indicator of inflationary developments in the economy. So it comes as little surprise to find them significant in a real wage equation. But are these effects structural, or due to the natural tendency for asset markets to inflate before the labour and commodity markets?

Bover *et al.* argue that these links are structural. Their Section III(d) on alternative hypotheses attempts to dismiss alternative explanations based on private sector liquidity, price expectations and profitability. In view of the leading indicator property of house price inflation, this section is arguably the most important of the paper. However, it is not entirely convincing.

Measures of private sector liquidity have been massively distorted during the 1980's by the rise in real interest rates and the fall in the user cost of liquidity. That is why PSL2 (now M5) no longer acts as a good leading indicator. However recent research using Divisia indices (which correct for these distortions) reveals that these are still a good leading indicator.

This shift in real interest rates makes the consols yield a poor indicator of changes in inflationary expectations. The McCallum (1975) treatment of price expectations offers a better approach, and is fairly standard now. Moreover the McCallum treatment of excess supply in the labour market (in terms of its underlying causal variables) offers an alternative to Bover *et al.*'s unemployment measure, which has almost certainly been distorted by changes in definition and the propensity to register. Bover *et al.* *HP* variable could be picking up the effect of labour market conditions, which are also highly cyclical.

The last sentence of Section III(d) suggests that Bover *et al.* are prepared to accept that profitability can affect wages. It would be difficult to deny this within the context of a bargaining model! The *NL* model upon which this work is founded is a wage-only bargaining model, in which the wage is negotiated, leaving the employer free to decide manning levels. But as

McDonald and Solow (1981) have shown, it is more efficient to negotiate jointly over wages and employment. Recent research using this model suggests that union preferences shift systematically with the government, helping to explain the simultaneous rise in productivity and real wages under the present administration (Spencer, (1988)).

Output, employment and wages should be modelled simultaneously, in a way which allows for this sort of interaction effect. The treatment of productivity in the *NL* model, which only allows for shifts in productivity trends through capital deepening (via K/L), certainly leaves a lot to be desired. Muellbauer's own data for manufacturing (1986) shows that the capital deepening effect is remarkably constant, but reveals marked shifts in the residual (total factor productivity) trend. The same may be true for non-manufacturing.

Despite these qualifications, the role of the house price effects in the Bover *et al.* real wage equation is impressive and the significance of *RD* (and the mobility variable *MOBR*) in the u, v equation lends strong support to the view that there is a structural link between the labour and housing markets. These results are surprisingly robust, which also supports the structural hypothesis.

Policy Implications

John Muellbauer's empirical work corroborates at the aggregate level the story emerging from microeconomic studies of the links between the housing and labour markets. As such, it has important policy implications, considerably strengthening the case for a comprehensive reform of housing policy. However, in view of the doubts expressed about the effect of a general rise in house prices, I think he probably exaggerates the effect of the tax subsidy to owner occupation. Although this has almost certainly increased *HP*, the effect of this variable on the supply side and employment may in fact have been quite small. The tax subsidy, working in conjunction with regional supply constraints, may however have hampered the supply side through the *RD* variable. Alan Holman's assessment, that the tax system has been largely to blame for the decline of the rented sector, is also convincing, but this effect should be reflected in *MOBR* and not *HP*.

Finally I would note that the key mobility-disincentive effect tends to occur because house prices respond more fully than wages to regional demand shocks. In other words, it is the labour market that is the real culprit. Housing policy, whilst potentially very useful, remains a second best approach to the problems of regional unemployment and aggregate wage pressure.

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