Wages, Work Intensity and Unemployment in Japan, UK and USA

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Abstract

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This paper focuses on the impact of excess labour supply on wage inflation in Japan, the US and the UK. We extend the usual analysis to incorporate the impact of excess supply within the firm.

Our estimated wage equations provide some support for the widely held view that the US labour market is inherently more "flexible" than that in Japan or the UK. In particular, US wages respond quickly to information internal to the firm (and with a lag to outside labour market conditions). However, whilst measured unemployment has no impact on Japan's wage inflation, the ultimate response of wages to internal work intensity is estimated to be twice that in the US. Our UK results are more tentative, suggesting that both unemployment and work intensity matter, though their impact has evolved over time. Our key conclusions are that work intensity is an important factor in determining wage inflation, and that results based on recorded unemployment rates alone seriously underestimate the flexibility of real wages.

Key words: unemployment, labour hoarding, wage determination.
JEL-Code: J3, J5, J6.

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Introduction

Theoretical and empirical work on relationships between wages and unemployment has been dominated by a restrictive interpretation of the latter variable. Unemployment is measured in terms of officially registered unemployed persons expressed as a proportion of the total active labour force. This is a perfectly adequate way to proceed if we accept that there is more or less constant work intensity among those in employment. But we know that work intensity within firms cannot generally be regarded as constant. Throughout major industrialised economies, the general observation is that hourly productivity varies pro-cyclically (Hart and Malley, 1999) and a range of labour market theories have been devised to underpin this stylized fact. Theories of labour hoarding have been especially prominent. Variations in productivity suggest that gaps occur between actual and potential output. Where actual hourly output is less than potential output at current prices then the associated internal 'excess supply' of labour is no less real than that externally available on the outside market. Moreover, this excess supply may negatively interact with the wage as parties agree to dampen wage growth in order to minimise costly separations.

Thirty years ago, Taylor (1970) established for the US labour market that adopting a more general measure of excess labour supply that embraces concepts of work intensity and worker discouragement[1] has a potentially fundamental impact on the study of wage-unemployment relationships (see also Vanderkamp, 1973). Since that time, the main thrust of the 'unemployment debate' has proceeded along the more restricted route of the claimant count. This almost certainly arises from the fact that the rate of registered unemployment is a socially and politically more sensitive variable than the degree of work intensity within firms. The problem is that by ignoring excess labour supply on firms' intensive margins, empirical estimates of extensive margin effects may be distorted and thereby misleading.

1. We do not consider worker discouragement, or so-called 'hidden' unemployment, here. In preliminary investigations we used a number of proxy measures of discouragement, all of which were quantitaively most significant in Japan during the 1970s. However, hidden unemployment was not found to have any significant effect in wage determination.

This paper re-visits the important arguments raised by Taylor. We extend the earlier analysis in three ways. First, we motive the approach by means of a simple Nash bargaining model. Second, our econometric methodology deals more generally with short-run dynamics and long-run effects. Third, our empirical work is undertaken for Japan, UK and USA, each of which represents a different magnitude and direction of the problem of omitting work intensity.

We demonstrate that observed wage-unemployment interactions are better understood when both external and internal labour supply features are embraced. Like Taylor, we find for the US that both extensive (external) and intensive (internal) measures of unemployment add to our understanding of the wage-unemployment relationship. For Japan, the omission of the intensive margin is much more serious since it provides the most important source of excess supply. In the case of the U.K. there is a significant stretch of time when the extensive margin matters most and one where the intensive margin is of uppermost importance.

In section 1 we provide estimates of total unemployment in the three countries, broken down into 'hoarded' and claimant-count components. Section 2 presents a simple bargaining model in which we derive a wage equation that includes work intensity and unemployment as two of its explanatory variables. Section 3 introduces the methodology used in the empirical analysis. Results are presented and discussed in section 4. Section 5 concludes the paper.

1. Measuring unemployment to account for work intensity

What impact does variations in work intensity have on externally-based measures of unemployment? In order to gain an insight into this question, we adopt a standard trend-through-peaks approach (e.g. Fair, 1985) to obtain an estimate of the former variable. It is assumed that the workforce is fully utilised at peak points in the time series of productivity, measured as output per worker.[2] Let Y denote output and N denote number of workers. Interpolating such peaks and comparing these points of maximum potential productivity $(Y/N)^*$ with actual productivity (Y/N) provides a measure of excess labour for each time period. Specifically labour hoarding at time t, h_t, is given by:

$$h_t = \left[1 - \frac{(Y/N)_t}{(Y/N)_t^*} \right] N_t$$

Whilst recorded unemployment, or the claimant count, can be used to identify under utilisation at the extensive margin, hoarding offers a measure of underutilisation of labour at the intensive margin. The resulting estimates of hoarding and "total" unemployment (recorded + hoarded) are shown in Figure 1 for the period 1960 – 1997.

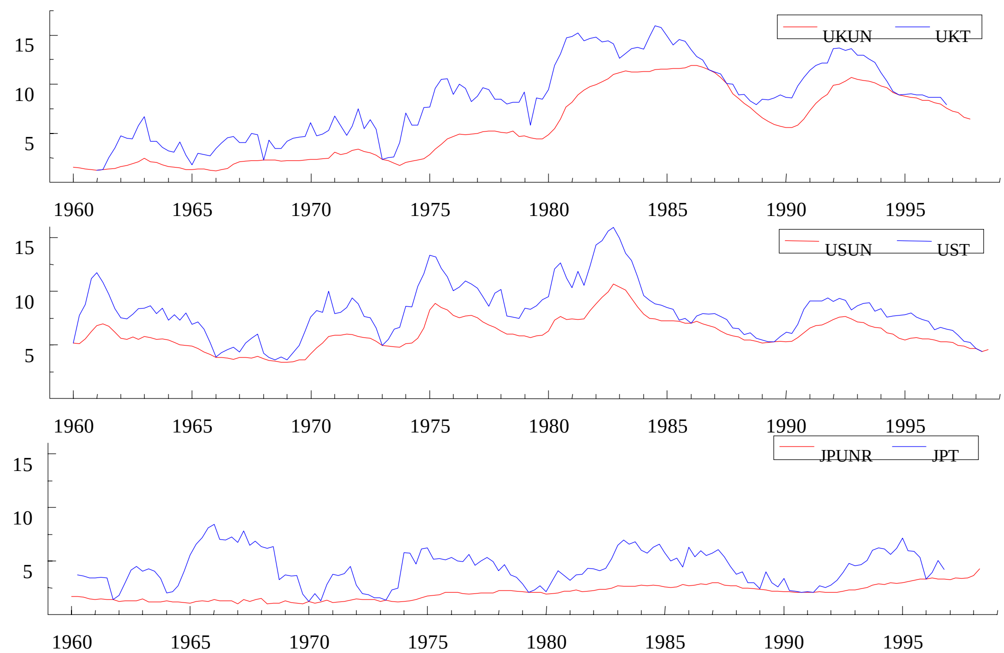
There are three main features of these results. First, in all three countries, there are significant periods of time during which excess supply of workers within firms comprised a significant part of total unemployment. See, for example, the period immediately after the first oil shock in the mid 1970s. Secondly, there is evidence - especially in the cases of the UK and USA - that hoarded unemployment was quantitatively more important pre-1985. In the case of the UK, reduced hoarding in more recent times may well reflect the general drive for more flexible labour markets, as stressed by Thatcher and later governments. Thirdly, over the entire period, internal excess

[2] Output per worker is used here in order to construct Figure 1. Strictly, output per hour is the more appropriate measure. In our main empirical work, estimates based on hourly productivity and hourly work intensity are also provided.

labour supply represents a much larger share of total unemployment in Japan than in the other two economies. Typically, significant variation in work intensity in Japan is linked to the view that a low transaction cost environment helps to stimulate high per-capita human capital investments and that the resulting rent sharing limits the degree of worker-firm separations (Hashimoto, 1979; Aoki, 1988).

Figure 1

MEASURED UNEMPLOYMENT AND TOTAL UNEMPLOYMENT



UNR = registered unemployment, T = total unemployment

In general, the quantitative importance of excess labour within firms, coupled with inter-country differences in incidence of the two rates, support the objective of integrating work intensity into the analysis of wages and unemployment. Towards this end, we start by presenting a simple bargaining model.

2. A bargaining model

Our intention here is to provide a simple bargaining model that aims to motivate our approach to wage estimation. Consider a Nash bargain between a 'representative' firm and its union. The parties jointly set wages in order to maximise a weighted average of the union's utility and the firm's profit. For simplicity, we concentrate on joint bargaining with respect to the wage. We do not attempt to say anything about employment setting. The level of employment is a given variable to the bargainers. We might imagine that employment contracts cover a longer time horizon than wage agreements and that the wage bargaining agenda does not embrace longer-term employment consequences of short-term wage setting.[3]

The parties' joint objective is represented by

(1) $$\max \Omega = (U)^{\gamma}(\Pi)^{1-\gamma}$$

where U is the union's utility function and Π is the firm's profits and γ is the union's relative bargaining power.

The union's utility is a function of the negotiated wage, the alternative wage and the level of employment:

(2) $$\mathrm{U} = \left[\frac{\mathrm{W}}{\mathrm{P}} - \delta(\mathrm{b}) - \left(1-\phi(\mathrm{u})\right)\frac{\overline{\mathrm{W}}}{\mathrm{P}} - \phi(\mathrm{u})\frac{\mathrm{B}}{\mathrm{P}}\right]\mathrm{N}$$

where $\frac{\mathrm{W}}{\mathrm{P}}$ is the bargained wage, $\frac{\overline{\mathrm{W}}}{\mathrm{P}}$ is the outside wage, B is unemployment benefit, $\phi(\mathrm{u})$ is the probability of being unemployed, N is employment and b is an index of the intensity of work. We assume that short-run changes in b are exogenous. Johnson (1990) provides a generalisation in which the joint bargain also includes intensity of work.

[3] In a dynamic context, we might imagine that wages and work intensity adjust more speedily than employment to changes in economic variables. Impediments to employment adjustment might include human capital considerations, legislative impediments and industrial relations' issues.

The firm's profit function is given by

(3) $$\Pi = PY - \frac{W}{P} N$$

where Y is total output produced by the firm. Output in the short run is a function of the number of workers and their work intensity, b, or

(4) $$\mathrm{Y = F(bN).}$$

Maximising (1) with respect to the wage, we obtain the following expression:

(5) $$\frac{(1-\gamma)}{\gamma}\mathrm{N}[\omega] = 0$$

where ω is defined as

(6) $$\omega = \left[\frac{\mathrm{W}}{\mathrm{P}} - \delta(\mathrm{b}) - (1-\phi(\mathrm{u}))\frac{\overline{\mathrm{W}}}{\mathrm{P}} - \phi(\mathrm{u})\frac{\mathrm{B}}{\mathrm{P}}\right].$$

Equating the inside and outside wage, we can rewrite (6) as

(7) $$\omega = \frac{\mathrm{W}}{\mathrm{P}}\phi(u)(1-\mathrm{R}) - \delta(\mathrm{b})$$

where R is the replacement ratio. Now we substitute (7) and (3) into (5) and we solve for the wage rate to obtain

(8) $$\frac{\mathrm{W}}{\mathrm{P}} = \left[\frac{\mathrm{PY}}{\mathrm{N}} + \frac{(1-\gamma)}{\gamma}\delta(\mathrm{b})\right]\left[\frac{(1-\gamma)\phi(u)(1-\mathrm{R})+\gamma}{\gamma}\right]^{-1}.$$

Log-linearising equation (8), gives us the final specification that is used in the empirical analysis:

(9) $$\frac{W}{P} = \beta_{0+}\beta_1 \frac{PY}{N} + \beta_2 \delta(b) - \beta_3 u + \beta_4 R$$

Note that equation (9) can also be derived in terms of the total number of hours worked instead of the number of workers. In that case we have hourly wages as the dependent variable and hourly productivity on the right hand side. In section 4 we present results for both specifications.

3. Estimation

We have estimated wage equations based on (9) for the US, Japan and the UK using quarterly data over the period 1968-1996. The equations take the form of dynamic error correction models where (9) represents the long-run influences on the real wage. This approach is common in the literature and essentially follows Darby and Wren-Lewis (1991). The dependent variable is the change in the log of the real product wage, dw. We have allowed for data determined dynamics in price inflation, to reflect nominal inertia i.e. the slow catch up in nominal wages to changes in inflation (these terms are denoted ddpy). There are further dynamics in past wage inflation dw(-j) and in work intensity, din(-j). The levels variables reflect those included in (9). Trend productivity is included, pr(-j), to capture the term PY/N. Work intensity, b in the theoretical model, is denoted in(-j) and it is proxied by h^{-1}, that is the inverse of labour hoarding (as defined on page 4). The unemployment rate is denoted u(-j). The replacement ratio, R, was statistically insignificant is our equations and hence does not feature in the empirical results[4].

The final specifications reported in tables 1 and 2 reflect the outcome of a general-to-specific search. The implied long-run solutions, which relate directly to equation (9), are reported in Table 3. All data are from the OECD Business Sector database and are constructed so as to be comparable across countries.

[4] This variable is notoriously hard to measure appropriately. We have tried to work with data constructed on a comparable basis for the OECD Jobs Study, but this is only available on a biennial basis. The information content of the series is probably low, and there is no measure of the strictness with which benefit eligibility criteria are applied. We found R to be statistically insignificant in our equations.

As mentioned in the previous section, two specifications of equation 9 will be used in the empirical analysis. The first is a worker-based and the second is an hour based equation. The second one is an hours-based equation. One reason for looking at the hourly specification is that our hours data takes into account part-time and overtime work, as well as normal hours (O'Mahony 1999). The importance of part-time work in Japan and the increasing importance of part-time employment in the UK can affect the wage-unemployment relationship.

4. Results

Tables 1 and 2 contain our estimates of the specifications outlined above. They are delineated, respectively, by workers- and hours-based measures of productivity and work intensity. In general, we find that measurement of productivity and work intensity on an hourly basis, rather than per worker, has an impact on the Japanese and UK results but makes little difference in the case of the US. Table 3 contains the estimated long run coefficients on productivity, unemployment and work intensity arising from these worker and hours equations.

(a) Long-run relationships

The long-run coefficients shown in Table 3 are derived from the results in Tables 1 and 2: they are the estimates after full dynamic adjustments have been allowed for. Work intensity plays a significant role in both Japan and the United States. We obtain similar long-run positive associations with the wage in terms of the worker equations. In the hours' dimension, however, the Japanese coefficient is twice as large as its equivalent in the US. These latter findings are consistent with existing Japanese evidence that (a) hours are an important consideration in measures of internal excess labour supply and (b) Japanese internal excess supply is a comparatively large phenomenon (Odagiri, 1992; Hart and Malley, 1996; Vecchi, 2000). By contrast, work intensity is weakest and least well determined in the UK; in fact, in the hourly based results in Table 2 there is only a temporary positive effect of work intensity on the level of wages.

The key contribution to the intensive margin in the wage determination process in Japan is underscored by the finding of no significant unemployment effects on the wage in that economy.[5] In the US, there is strong evidence that both work intensity and unemployment affect wages. Therefore, the original findings of Taylor (1970) are supported in our data set.

Two other long-run observations are worth reporting. First, we note that real wages are unaffected by inflation in all three countries. The second relates to productivity, and supports an advantage of the hours' based results. Strictly speaking, our simple model implies a unity coefficient on productivity (see equation (8)). This follows from the simple form of the profit function. Yet, the equivalent long-run result for Japan suggests that wages will rise by only 0.55% for every 1% gain in productivity. The equivalent elasticity in the case of the US is over 0.8% while in the UK is unity. Using an hourly based measure of productivity raises the Japanese elasticity to 0.78.

(b) Short-run relationships

In a shorter-term perspective, there is evidence in Tables 1 and 2 of contrasting dynamic adjustments.

The fastest adjustment of real wages to target occurs in the US. This might seem surprising in the context of an economy in which wage contracts are typically set for up to 3 years ahead. However, we note that the equation implies that contracting will be based upon expected or trend productivity, expected inflation and unemployment. The US estimates are consistent with their being little by way of inflation or productivity surprises. The estimates relating to work intensity suggest that current and last quarter work intensity matter to current real wages. The unemployment effect is slower in the sense that u(-2) is clearly dominant in tests of the appropriate lag structure. Wages

[5] Adding lagged unemployment, or alternatively, up to three lags in unemployment to the Japanese equation can easily be reject on the basis of standard t and F tests, with probability values t = .700 and F = .652 respectively. Moreover, inclusion of these unemployment terms has no impact on the size or significance of the other parameters.

respond quickly to information internal to the firm and with a lag to conditions in the labour market as a whole.

Japan shows more sluggish adjustment of wages. There is evidence of nominal inertia, in the sense that real wages react to changes in inflation with a lag. The coefficient on w(-1) indicates that wages adjust to their long-run target level at a slower rate in Japan than in the other countries. The hourly equation specification in Japan has some attraction over the alternative. The coefficient on the level of the real wage is larger and attracts greater significance. This provides stronger evidence in favour of the error correction formulation.

For the UK, the switch from per worker to per hour results in the loss of a significant level effect from work intensity on wages. Although it is notable that neither UK equation is particularly well specified. CUSUM and CUSUMSQ plots clearly indicate some problems of instability which may also be behind the strong evidence of significant ARCH (4) effects.

Table 1: Worker-based wage equations

Sample Period 1968:1 - 1996:4, 116 Quarterly Observations.
Dependent variable is dw, estimation is by OLS.

	JAPAN			UNITED STATES			UNITED KINGDOM		
intercept	0.1619 (.016)			0.1485 (.038)			0.0032 (.003)		
ddpy	-0.4803 (.076)			-			-0.4107 (.058)		
ddpy(-1)	-0.4241 (.100)			-			-		
ddpy(-2)	-0.2411 (.076)			-			-		
dw(-1)	-0.3117 (.073)			-			0.3167 (.068)		
din	-			0.3669 (.050)			0.4339 (.035)		
w(-1)	-0.0755 (.016)			-0.1582 (.042)			-0.1248 (.068)		
pr(-1)	0.0418 (.017)			0.1283 (.037)			0.1248 *		
in(-1)	0.1498 (.057)			0.1571 (.033)			-		
in(-3)	-			-			0.0753 (.063)		
u(-1)	-			-			-0.2977 (.100)		
u(-2)	-			-0.4526 (.207)			-		
Rbar^2	0.7422			0.3848			0.6771		
F	F (9,106)	37.78	[.000]	F(5,110)	15.39	[.000]	F(10,105)	25.12	[.000]
Unit	t(106)	9.341	[.000]	t(110)	3.592	[.000]	t(102)	1.074	[.285]
LM1	F(1,105)	0.163	[.687]	F(1,109)	2.351	[.128]	F(1,104)	0.064	[.800]
LM4	F(4,102)	0.178	[.949]	F(4,106)	0.994	[.414]	F(4,101)	1.208	[.312]
LM8	F(8, 98)	0.335	[.951]	F(8,102)	0.677	[.710]	F(8,97)	2.060	[.047]
HET	F(1,114)	0.045	[.832]	F(1,114)	4.207	[.043]	F(1,114)	0.018	[.894]
ARCH1	F(1,105)	0.001	[.975]	F(1,109)	1.999	[.160]	F(1,104)	0.753	[.388]
ARCH4	F(4,102)	0.289	[.885]	F(4,106)	1.589	[.183]	F(4,101)	5.555	[.000]
RESET	F(1,105)	0.911	[.342]	F(1,109)	0.818	[.368]	F(1,104)	0.394	[.532]
NORM	Chi-Sq(2)	2.212	[.331]	Chi-Sq(2)	2.042	[.360]	Chi-Sq(2)	1.434	[.488]

w - real compensation per worker
pr - trend productivity
u - unemployment rate
in - work intensity
py - value added deflator
d - first difference operator
dd - second difference operator
All variables are in logs.

Unit – test of unit long-run coefficient on pr
LM1,4,8 – Lagrange Multiplier tests for serial correlation
HET – test of heteroscedasticity based on squared residuals
ARCH1,4– test of autoregressive conditional heteroscedasticity
RESET – Ramsey RESET test of functional form
NORM – Jarque Bera test of residual normality

Note.
The Japanese equation incorporates two (0, 1,-1,0) dummy variables for the period following the 1973 oil shock. The UK equation incorporates similar (0,1,-1,0) dummy variables to capture the temporary effects of the 1973 oil shock, the three day week in 1974:2 and the catch-up effects following the removal of incomes policy in 1975. The estimated coefficients attached to these dummies are not reported to preserve space. Exclusion of the dummy variables results in rejection of the null hypothesis that the equation residuals are normally distributed.
The absence of a standard error on coefficient on the trend productivity, pr, in the UK equation reflects the fact that a unit long-run coefficient has been imposed, and as noted under “Unit” in the table, this restriction is data consistent.

Table 2: Hours-based wage equations

	JAPAN			UNITED STATES			UNITED KINGDOM		
intercept	0.1356 (.013)			0.1426 (.030)			0.0038 (.003)		
ddpy	-0.4815 (.074)			-			-0.4028 (.058)		
ddpy(-1)	-0.4463 (.096)			-			-		
ddpy(-2)	-0.2450 (.071)			-			-		
dw(-1)	-0.3139 (0.64)			-			0.3412 (.068)		
din	-			0.3544 (.053)			0.4572 (.064)		
w(-1)	-0.1234 (0.06)			-0.1636 (.042)			-0.1391 (.033)		
pr(-1)	0.0968 (.016)			0.1355 (.007)			0.1391		
in(-1)	0.2213 (.044)			0.1457 (.051)			-		
in(-3)	-			-			-		
u(-1)	-			-			-0.3589 (.102)		
u(-2)				-0.5458 (.002)			-		
$Rbar^2$	0.7538			0.3858			0.6898		
F	F(9,106)	40.13	[.000]	F(5,110)	15.45	[.000]	F (9,106)	27.46	[.000]
Unit	t(106)	9.246	[.000]	t(110)	4.310	[.000]	t(106)	1.333	[.186]
LM1	F(1,105)	0.804	[.372]	F(1,109)	2.137	[.147]	F(1,105)	0.205	[.651]
LM4	F(4,102)	0.440	[.779]	F(4,106)	0.796	[.531]	F(4,102)	1.355	[.255]
LM8	F(8,98)	0.622	[.758]	F(8,102)	0.545	[.820]	F(8, 98)	2.184	[.035]
HET	F(1,1 14)	5.480	[.021]	F(1, 1 14)	1.982	[.162]	F(1,114)	0.043	[.835]
ARCH1	F(1,105)	0.008	[.930]	F(1, 1 09)	1.262	[.264]	F(1,105)	0.731	[.395]
ARCH4	F(4,102)	0.272	[.896]	F(4,106)	0.893	[.471]	F(4,102)	6.259	[.000]
RESET	F(1, 1 05)	6.189	[.014]	F(1,109)	0.964	[.328]	F(1,105)	0.057	[.812]
NORM	Chi-Sq(2)	0.243	[.243]	Chi-Sq(2)	1.695	[.428]	Chi-Sq(2)	1.457	[.483]

w - real compensation per hour
pr - trend productivity
u - unemployment rate
in - work intensity
py - value added deflator.
d - first difference operator
dd - second difference operator
All variables are in logs.
Note: dummy variables are included in the Japanese and UK equations and the unit long-run coefficient on trend productivity is imposed in the UK equation as in Table 1.

Table 3: Estimated long-run coefficients

Implied long-run relationship in levels: $w = \text{constant} + \alpha\, pr + \beta\, ur + \gamma\, in$

	JAPAN		UNITED STATES		UNITED KINGDOM	
	(A)	(B)	(A)	(B)	(A)	(B)
α	0.554	0.784	0.811	0.828	1.000	1.000
β	-	-	-2.868	-3.337	-2.385	-2.578
γ	0.984	1.796	0.933	0.890	0.603	-

Note: (A) derive from the worker-based results in Table 1.
(B) derive from the hours-based results in Table 2.

5. Conclusions

The paper has analysed the implications for wage determination, of adopting a more general measure of the excess labour supply in US, UK and Japan. In all three countries, there are significant periods of time during which excess supply of workers within firms comprised a significant part of total unemployment. The different patterns reflect differences in labour market institutions across countries and through time. For example, factors like a more flexible labour market in the UK after the Thatcher period or the comparatively higher labour hoarding in Japan are picked up by our excess labour supply measure.

We show results for both worker-based and (total) hours-based equations. This enables us to account for some of the institutional differences across countries (for example, the prevalence of part-time employment in the UK and in Japan). We find that hourly-based measures of productivity and work intensity have a stronger impact in Japan, while they make little difference in the US. Estimates of the long-run coefficients show that there is a positive correlation between wages and work intensity in all three countries. Such correlation is particularly strong in Japan when the hours-based wage equation is estimated. This reflects the higher propensity of Japanese firms to hold excess labour over the business cycle. In the UK and the US, we find strong and negative effects of the standard unemployment rate on wages. This contrasts with Japan where no effects are found.

There are three main comparative findings on the short-run dynamic adjustments in the countries. First, the US shows a faster wage adjustment to the other two countries. Second, the hours-specification is better determined for Japan. Third, the UK results allow us to offer only some tentative conclusions: both recorded unemployment and internal work intensity impact on wage inflation, but their impact has evolved over time. In general, it appears that the relative contributions of inside and outside excess supply influences in the UK are more complex to evaluate, and more work is needed in this respect. At least, our evidence points to the fact that excess supply effects on wages within firms should be accommodated in future UK work on wage determination.

Finally, this paper has emphasised the importance of accounting for other measures of excess supply on the labour market. Results based on the recorded unemployment rates can seriously underestimate actual labour market wage responses. We believe that this is an area that deserves further attention.

This work should be regarded as a prototype for more advanced approaches. A number of extensions to this work might well produce significant value added. There are two obvious candidates. First, hoarding might be treated as an endogenous variable by incorporating work intensity in the firm-union bargaining agenda. Second, on the econometric side, **[Julia/Michela]**

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This paper looks at wage inflation in the UK, the US and Japan. We focus in particular on the impact of excess labour supply. Rather than measuring excess supply of labour purely in terms of registered unemployment, we extend the usual analysis to look at the impact of excess supply of workers within the firm. As is well known, firms may 'hoard', or under utilise, labour which effectively means that, internally, more hours are supplied than demanded at given wages. Our key conclusion is that results based on recorded unemployment rates alone seriously underestimate the flexibility of real wages.

This extension is important, since both over time and across countries, there is considerable variation in internal utilisation of labour. As figure 1 shows, measured unemployment presents a particularly poor measure of the true extent of the under utilisation of labour in Japan. The prevalence of labour hoarding in this economy is well known. The decreased incidence of internal under utilisation is less well documented in the case of the UK and the US (again see Figure 1).

Our results provide some support for the widely held view that the US labour market is inherently more “flexible” than that in Japan or the UK. In particular, US wages respond quickly to information internal to the firm while there is a response lag to conditions in the outside labour market. In Japan, whilst unemployment has no impact on wage inflation, the ultimate response of wages to internal work intensity is estimated to be twice the size of that in the US. From the UK perspective, we are able to offer more tentative conclusions. Both recorded unemployment and internal work intensity impact on wage inflation, but there their impact has evolved over time. In general, it appears that the relative contributions of inside and outside excess supply influences in the UK are more complex to evaluate, and more work is needed in this respect. At least, our evidence points to the fact that excess supply effects on wages within firms should be accommodated in future UK work on wage determination.