New evidence on the Korean wage curve

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Our new empirical evidence suggests that wages are substantially flexible in South Korea. In particular, our longitudinal evidence on the wage curve follows the minus-point-one rule, set up by Blanchflower and Oswald (1994) and is consistent with evidence from other countries.

I. Introduction

An exhaustive empirical and theoretical study conducted by Blanchflower and Oswald (1994) found a new empirical regularity of the negative relationship between wages and regional unemployment, that is, the ‘wage curve.’ The curve is roughly described by $-0.1$ of the elasticity of wages with respect to the local unemployment rate with human capital characteristics of individual workers controlled for (ibid, p. 361). This finding is based on individual data on wages and regional unemployment rates within 12 countries, and is pre- and re-confirmed by their own work and other studies dealing with different countries.\(^1\)

However, estimates in Table 9.1 of Blanchflower and Oswald (1994) reveal some variation in the wage curve elasticity with South Korea having the smallest estimate (in an absolute value) of $-0.04$, suggesting that wages are relatively rigid in Korea than other countries. This observation seems at odds the fact that the union membership rate is lower in Korea than in most developed countries. Unlike the union sector, the nonunion sector offers competitive wages so that nonunion wages tend to move more flexibly depending on labour market conditions.\(^2\) In addition, wage negotiations are relatively decentralized in South Korea.

This article re-examines the Korean wage curve to determine if the Korean labour market obeys the minus-point-one-rule and thereby to re-evaluate the wage flexibility in Korea. In fact, Blanchflower and Oswald (1994, p. 362) state that ‘[S]outh 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.’ In general, wage flexibility plays an important role in determining a country’s ability to adjust successfully to economic turbulence. Also, wage stickiness is a key feature of many models of the business cycle and is considered to be a major cause of unemployment fluctuations among macroeconomists.

We complement Blanchflower and Oswald’s work (1994) on two aspects. First, Blanchflower and Oswald (1994) used the industry unemployment rate instead of the regional unemployment rate. Because the industry unemployment rate is not well defined, measurement error in the explanatory variable would attenuate the true wage curve elasticity. To test if the smaller elasticity is due to the use of the industry unemployment, we use the

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\(^1\)See Blanchflower and Oswald (2005) for a complete review of these studies.
\(^2\)See McDonald and Solow (1985) among others.
same Occupational Wage Survey (OWS) data as used by Blanchflower and Oswald (1994), but, for a more recent sample period 1990 to 2003. This is the longest sample period where regional unemployment rates are available.

Second, and more importantly, we use longitudinal data from the Korea Labour and Income Panel Study (KLIPS) for the 1998–2002 period to provide fixed-effects estimates of the wage curve elasticity. Suppose workers move from high-unemployment regions to low-unemployment regions, looking for low unemployment probability and higher wages. If inter-regional mobile workers are marginal workers both in the origin and destination regions, the true negative association is to be obscured, when these composition effects are not controlled for.3

II. Data and Econometric Method

The OWS is a random sample collected annually (every March) by the Korean Ministry of Labour since 1968. While the sampling unit is establishment, the survey collects information on individual workers’ pay and their residence along with various wage-related characteristics. The survey excludes small-scale establishments and temporary workers. Our final OWS sample includes approximately 5.8 million individual observations from 1990 to 2003 period.

The KLIPS conducted by the Korea Labour Institute has been tracking nationally representative individual workers since 1998. Because, unlike the OWS, the KLIPS includes all types of workers in the sample, such as temporary workers and workers from small-scale establishments, the estimated wage curve elasticity is expected to be greater in the KLIPS than in the OWS. The final regression sample includes 4098 individuals and 11,981 year-person observations for 5 years from 1998 to 2002.

We estimate the following log-wage equation:

\[
\log W_{irt} = \alpha X_{irt} + \delta \ln LUR_{rt} + DR + DT + u_{irt} \tag{1}
\]

where \( W_{irt} \) is the hourly wage rate (deflated by the regional CPI) for person \( i \) observed in local labour market \( r \) in year \( t \). \( X \) is a set of measured individual characteristics, \( LUR \) is the local unemployment rate, \( DR \) is a set of region dummies, \( DT \) is a set of year dummies and \( u \) is the error term.

Two econometric issues are worth noting. First, the error terms of different individuals in the same region may share some common component of variance that is not entirely attributable either to their measured characteristics or to the local rate. Neglecting this cross-sectional positive correlation across people in the same region may underestimate the conventional SE estimates. To obtain appropriate SE estimates, we follow a two-step procedure which is similar to the one adopted by Solon et al. (1994). The first step involves estimating region-by-year mean wages with individual characteristics controlled for

\[
\log W_{irt} = \alpha' X_{irt} + \delta (DR \times DT) + v_{irt} \tag{2}
\]

In the second step, weighted least squares are applied to the following equation, weighting each region-by-year observation by the number of individuals available for that region-by-year cell in the first step.4

\[
\hat{\delta}_{rt} = \beta \ln LUR_{rt} + DR + DT + \omega_{rt} \tag{3}
\]

Second, to control for within-region composition changes associated with unobservable as well as observable worker characteristics, we use the KLIPS data and apply the fixed-effects estimation to Equation 1.

III. Empirical Findings

Graph 1 displays unemployment rates by region and year. First, unemployment rates vary greatly across 15 regions and over time, ranging from 0.4% to 9.1%. Second, the ranking of regional unemployment rates is relatively stable over time, that is, high- or low-unemployment regions are actually identified.

Table 1 reports the results based on the OWS data. For brevity, only the estimates of unemployment coefficients are reported and discussed. When regional dummies are omitted in the second step (column 1), no correlation exists between wages and regional unemployment rates. However, in the spirit of a wage curve, when the region dummies are included in the equation (column 2), the wage curve elasticity is estimated at −0.0388. This pattern is consistent with Card’s (1995, p. 789) and Blanchflower and Oswald’s (2005, p. 10) observation that, in the US, average levels of unemployment across states are weakly positively correlated with average wages.

3 Until now, only Bratsberg and Turunen (1996) presented longitudinal evidence on the wage curve with unobserved individual fixed effects controlled for.

4 This choice of optimal weighting is based on a formal test suggested by Solon et al. (1997).
The estimated unemployment elasticity of \(-0.0388\) is remarkably similar to Blanchflower and Oswald’s estimate \((-0.0403, \text{column 5 of Table 8.8, 1994})\) based on the same data source for the 1971–1986 period and the industry unemployment rate. This generally implies that little attenuation inconsistency is involved in using the error-ridden industry unemployment rate. To consider autocorrelation in regional wage series \((\hat{\delta}_{t-1})\), in columns (3) and (4), we include the lagged dependent variable as an additional regressor in the second step estimation. When regional fixed effects are not controlled, the estimated coefficient of the lagged dependent variable is close to one, and the estimated unemployment coefficient is positive. These estimates produce a long run unemployment elasticity of 0.1722, computed as 0.0151/(1 – 0.9123). It is tempting to conclude that the data is well described by a Phillips curve. However, when regional dummies are included in the second step equation, the estimated coefficient of the lagged dependent variable drops to 0.6642, which is different from one at any conventional significance level. Despite the imprecision of the estimated coefficient of the unemployment rate, the long run unemployment elasticity is computed at \(-0.0652\).

Table 2 presents longitudinal evidence on the wage curve from the KLIPS data. For the sake of simplicity, we revert to the conventional static model. Focusing on the regional fixed effects model first (column 3), the estimated unemployment elasticity becomes \(-0.0748\), in comparison with \(-0.0388\) obtained from our OWS sample. As in the OWS data,
however, including region dummies increases the estimated wage curve elasticity, as revealed from the pair-wise comparisons of columns 1 and 3 and columns 2 and 4.

Controlling for individual fixed effects further increases the estimated wage curve elasticity. For example, our most preferred model, region-by-individual fixed effects model, produces a strong negative correlation (−0.0978), in comparison with the estimate of −0.0748 obtained with location dummies but without controlling for individual fixed effects. This supports the conjecture that within-region composition changes associated with unobservable worker characteristics mask the true wage responses to local labour market conditions. Now, a 10% increase in the regional unemployment rate leads to a fall in real wages by 1%, obeying the minus-point-one rule.

### IV. Conclusion

Overall, wages are substantially flexible in the Korean labour market. A fair summary of accumulated evidence is that, despite differences in the institutional set-up, labour markets are not different across nations in terms of wage flexibility.

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### References


