Efficiency of the Labor Market Allocation of Human Resources

Kim Dae Il

1. Issues

- Public concerns remain over possible delays in the enhancement of overall economic productivity as the labor market continues to ineffectively allocate domestic human resources.
  - The prompt transfer of human resources from low-productivity sectors to high-productivity sectors raises the efficiency of human resource allocation thus enhances the economy's growth potential.
- Accordingly, this paper will examine how the human resource allocation mechanism in the labor market has progressed and what issues to consider as a result.

2. Analytical Framework

- Using the Kim and Topel methodology, this paper will explore how changes in labor demand due to productivity shocks (technology development, increase demand of goods, etc.) effects employment and wage to measure the efficiency of human resource allocation in the labor market.
  - Positive(+) productivity shocks inflate demand output which increases the demand for all the production elements in a sector including labor and capital.

1) Professor, Seoul National University.

The following figure, which represents an efficient labor market, shows that in a two-sector economy, increased demand for labor in one sector drives intersectoral labor mobility which in turn, balances out the wage growth in both sectors.

- Specifically, increased labor demand in sector B\(D_B \rightarrow D_B^*\) will create upward pressure for wages to increase to \(w_1\) at the current employment level \((L_B^0)\); however, if the labor force shifts \((\Delta L)\) from sector A which has low wages to sector B, the wage level in both sectors will become the same at \(w^*\).

**Labor Reallocation based on Sectors’ Labor Demand Changes**

![Diagram](attachment:image.png)

However, if there are factors that limit labor mobility or human resource reallocation, this will suppress the reallocation of labor from the low-productivity sector \(A\) to the high-productivity sector \(B\), which will eventually impair economic efficiency and the allocation of resources.

- In extreme cases where there is no labor mobility, wages in sector \(A\) will stay at \(w_0\) while sector \(B\) sees wages increase to \(w_1\). Consequently, the prices of goods will rise leading to a loss of consumer welfare thus resulting in inefficiency.

Therefore, the efficiency of the human resource allocation mechanism can be determined by analyzing whether a relative increase in labor demand is tied to increased employment or increased wages in the relevant sector.
More specifically, the efficiency of human resource allocation will be determined by the level of impact from productivity shock causing labor demand changes on the rate of change in the employment and wages of relevant sectors.

With regards to industry \( j \) in year \( t \), in a regression analysis of employment and wages, with year and industry effects controlled, on labor productivity \((=\text{value added/number of employees.})\), the bigger \( \beta^N \) is and the closer \( \beta^W \) is to zero, the more efficiently the labor market allocates human resources.

\[
\text{Employment}_{jt} = \alpha^N + \beta^N \text{Productivity shock}_{jt} + \text{Residual}^N_{jt}
\]

\[
Wages_{jt} = \alpha^W + \beta^W \text{Productivity shock}_{jt} + \text{Residual}^W_{jt}
\]

3. Impact of Productivity Shocks on Employment and Wages

A regression analysis using manufacturing industry data from Statistics Korea’s ‘Mining and Manufacturing Survey’ revealed that the employment effect of productivity shocks has plummeted since the mid-2000s, reflecting a decline in the labor market’s efficiency of the human resource allocation mechanism.

Although productivity shock-induced increases in an industry’s labor demand had an increasing effect \((\beta^N > 0)\) in the industry’s employment until 2006, the effect itself is estimated to have fallen significantly to almost 0 from 2005 onwards.

Meanwhile, the increasing effect \((\beta^W)\) of an industry’s labor demand on the industry’s wages was found to have maintained a certain level throughout.

3) The reasons for confining the targets of analysis to manufacturing are as follows: 1) The survey on mining and manufacturing conducted by Statistics Korea provides materials about factors concerning which accurate statistics are hard to obtain in other industries (such as information on tangible fixed assets in manufacturing); and 2) information required to estimate productivity, such as value added, exists in only a limited amount in segmented service industries, etc.
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Employment and Wage Effects of Productivity Shocks (Manufacturing)

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<tbody>
<tr>
<td>Employment effects($\beta^N$)</td>
<td>0.431 (0.086)**</td>
<td>0.467 (0.080)**</td>
<td>0.033 (0.074)</td>
</tr>
<tr>
<td>Wage effects($\beta^W$)</td>
<td>0.173 (0.028)**</td>
<td>0.285 (0.017)**</td>
<td>0.130 (0.045)**</td>
</tr>
<tr>
<td>No. of observations</td>
<td>180</td>
<td>368</td>
<td>192</td>
</tr>
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</table>

Note: 1) The figures in parentheses represent the standard error.
2) *Significant 10% level, **significant 5% level, ***significant 1% level
3) Since the industry classification has changed over the surveyed period, the period was divided into 1971–90, 1991–2006 and 2005–12 to maintain consistency
Source: Statistics Korea, ‘Mining and Manufacturing Survey’.

By introducing productivity shocks interacted with time trends to the regression analysis, it was found that the effect of productivity shocks on employment weakens with time while that on wages is rapidly growing.

$\beta^N_2$ and $\beta^W_2$ were estimated using the previous model with the inclusion of productivity-time interaction term

$$
Employment_{jt} = \alpha^N + \beta^N_1 \text{Productivity shock}_{jt} \\
+ \beta^N_2 (time \text{ trends} \times \text{ Productivity shock}_{jt}) + Residual^N_{jt}
$$

$$
Wages_{jt} = \alpha^W + \beta^W_1 \text{Productivity shock}_{jt} \\
+ \beta^W_2 (time \text{ trends} \times \text{ Productivity shock}_{jt}) + Residual^W_{jt}
$$

As a result, the effect of productivity shocks on employment not only decreased over time ($\beta^N_2 < 0$) but has recently intensified.

On the other hand, that on wages is not only strengthening ($\beta^W_2 > 0$), but the trend is accelerating.

Temporal Trends of Productivity Shock Effects on Employment and Wages (Manufacturing)

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</thead>
<tbody>
<tr>
<td>Employment effects trend ($\beta^N_2$)</td>
<td>-0.009 (0.012)</td>
<td>-0.025 (0.015)*</td>
<td>-0.052 (0.030)*</td>
</tr>
<tr>
<td>Wage effects trend($\beta^W_2$)</td>
<td>0.003 (0.004)</td>
<td>0.011 (0.003)**</td>
<td>0.033 (0.018)**</td>
</tr>
</tbody>
</table>
When the same regression was applied to capital (total tangible fixed assets), another production factor, the results showed that a productivity shock increasingly led to a greater use of capital input which implies that companies have opted to adjust capital investment rather than labor in response to productivity shocks.

Moreover, since the mid-2000's, employment adjustments were hardly implemented and instead, a considerable adjustment of capital investment per worker was observed.

**Estimation of Productivity Shock Effects on Capital (tangible fixed assets)**
(Manufacturing)

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<tbody>
<tr>
<td>Employment effect ($\beta^Y$)</td>
<td>0.431 (0.086)**</td>
<td>0.467 (0.080)**</td>
<td>0.033 (0.074)</td>
</tr>
<tr>
<td>Total tangible fixed assets investment</td>
<td>0.561 (0.111)**</td>
<td>0.713 (0.077)**</td>
<td>1.001 (0.336)**</td>
</tr>
<tr>
<td>Tangible fixed assets per worker</td>
<td>0.281 (0.092)**</td>
<td>0.246 (0.047)**</td>
<td>0.969 (0.326)**</td>
</tr>
</tbody>
</table>

The above estimated results consistently show that increases in productivity shock-induced factor demand in an industry increased the capital investment in the industry. In contrast, there were no increases in employment while wages rose rapidly.

The results reveal that the efficiency of the human resources allocation mechanism in the domestic labor market is being significantly impeded.
4. Causes for the Decline in Employment Adjustment

This chapter will attempt to demonstrate that the decline in the domestic market’s resource allocation efficiency reflected in reduced employment adjustments was caused by the increases in labor costs due to strengthened employment protection regulations\(^4\).

Employment protection for workers increases employment adjustment costs and as such, this not only shrinks the demand for labor in the long-term but also curbs the range of fluctuation in labor demand (Nickell)\(^5\).

In order to demonstrate the effects of employment protection, the same regression is applied separately to full-time and part-time workers, given that employment protection is strong for the former while weaker for the latter.

From an employment protection perspective, it may seem more appropriate use regular and non-regular employment; however, due the limited availability of data, full-time and part-time were used as substitutes.

- The 「Mining and Manufacturing Survey」 only carries information on full- and part-time employment and not on regular and non-regular employment. Further, data on full- and part-time positions were not available in the Survey prior to 2006, making analysis of only 2007 to 2012 possible.

- Although regular/non-regular positions and full-time/part-time positions are different, they are similar in terms of employment protection, and the percentage for non-regular positions and part-time positions show a relatively strong correlation.

\(^4\) In addition to such systemic factors, changes in the market environment such as ① a decrease in the size of human resources newly joining the labor market, ② deepening specificity of human capital, and ③ deepening concentration of economic power can also be considered, but it appears to be difficult to explain the estimated results of the analysis as stated in the foregoing paragraph with these factors alone according to the analysis. For further details, read: Kwon Hyeok-uk and Kim Dae Il, "Analysis of the Efficiency of the Function of Human Resources Allocation in the Labor Market," 2015.

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### Sectoral Percentages of Non-regular Workers and Part-time Workers (2012)

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing sector</th>
<th>Construction sector</th>
<th>Service sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-regular positions (%)</td>
<td>0.22</td>
<td>0.59</td>
<td>0.39</td>
</tr>
<tr>
<td>Part-time positions (%)</td>
<td>0.14</td>
<td>0.53</td>
<td>0.36</td>
</tr>
</tbody>
</table>

According to the results, the employment response for productivity shocks was concentrated in part-time positions which have relatively weaker employment protection restrictions.

A shift in labor demand induced by a productivity shock in an industry results in part-time employment but not in full time employment; meanwhile part-time wages remain constant but full time wages rise. These results indicate that most of the burden falls on part-time workers (and non-regular workers) when a need for employment adjustment arises.

### Impact of Productivity Shocks on Employment and Wages by Employment Type in the Manufacturing Sector (2007~2012)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Regular positions</th>
<th>Non-regular positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment effects ($\beta^N$)</td>
<td>0.033 (0.074)</td>
<td>0.004 (0.090)</td>
<td>1.370 (0.600)*</td>
</tr>
<tr>
<td>Wage effects ($\beta^W$)</td>
<td>0.130 (0.045)**</td>
<td>0.133 (0.047)**</td>
<td>-0.069 (0.280)</td>
</tr>
</tbody>
</table>

Based on the results, a decrease in allocation efficiency in Korea’s labor market could be attributed to strong employment protection for regular workers.

Before the economic crisis, rapid economic growth resulted in persistent increases in labor demand. Moreover, implicit life-time job practices in large corporations were established, so the employment protection for regular workers did not have a negative impact on human resources allocation in the labor market.
However, after the economic crisis in 1998, the widespread public perception that large corporations could also be liquidated created a strong demand for employment protection. In fact, it is believed that the enacting of procedures for forced redundancies raised the level of employment protection for regular workers.

- Compromise in the Tripartite Commission during the period when efforts were being made to overcome the financial crisis resulted in the ambiguous clauses in the Labor Standards Act. For example, according to Article 24 of the Labor Standards Act, (2) 'an employer shall make every effort to avoid dismissal' and (3) 'shall have good faith consultation', which kept the potential for legal controversy high.

- The large-scale redundancy plans drawn up by large corporations, shortly after the Redundancy Act was implemented, became neutered due to the government's intervention as well as an external/internal struggle of the labor union. This confirmed that forced redundancy is very difficult in reality, thus making large Korean corporations dependent on costly honorary retirements.

Meanwhile, due to the strong employment protection for regular workers, firms are likely to use non-regular workers in various ways.

In response to this phenomenon, there has been an increasing trend toward employment protection for non-regular workers and their working conditions, including, for example, the enactment of the Fixed-term Workers Act to suppress the excessive use of and discrimination against non-regular workers.

5. Summary and Implications

Strong employment protection for regular employment is believed to be a major contributing factor to the gradual decrease in the effectiveness of the human resources allocation mechanism in the Korean labor market.

An increase in productivity does not lead to job creation but increases the wage levels.
Higher adjustment costs arising from strong employment protection contribute to concentrating labor allocations on temporary contracts; and it is evident that this phenomenon leads to the greater use of capital input instead of increasing the labor stock.

Such labor market rigidity hinders the efficient use of human resources in our society, thus it is likely that labor market rigidity can be a growth inhibitor while also exacerbating dichotomization.

The smooth shift of workers from a relatively low-productivity industry to a high-productivity industry will ensure the efficient use of limited labor resources, but it is also likely to ease social issues such as wage inequality.

Therefore, both a reduction of employment protection for regular workers and the implementation of policies to minimize any discrimination against non-regular workers are required to ensure more efficient allocation of labor resources and reduce labor market dualism.

The key element for labor market flexibility lies in reducing employment protection for regular positions.

- Considering the current dichotomy between regular and non-regular workers resulting from strong employment protection for regular workers, policies aimed at enhancing labor flexibility solely through the deregulation of the use of non-regular workers will likely to provoke serious social conflict.

Under the premise that employment protection for regular workers is relaxed, minimizing discrimination against non-regular workers while implementing policies to extend the labor supply will serve as a more sustainable solution for higher efficiency of resource allocation in the labor market and greater social integration.

- If employment protection for regular workers is not reduced, policies aimed at controlling the expansion of non-regular workers such as limiting the length of non-regular job contracts will likely make refusals to renew non-regular workers' contracts more common.