Regional Wage Determination and Economic Growth in Korea*

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I. Introduction

Regional differences in wages or incomes have generally attracted the attention of those concerned with problems of income distribution[1]; however, regional wage differences can also signal problems in labor market performance. For example, the evolution of the national wage structure may reflect the degree to which agents in the labor market respond to price signals or it may help to gauge the extent of national labor market integration. In this paper, patterns of regional wage dispersion in the Republic of Korea are used to evaluate labor market behavior over the course of Korean economic development.

The paper is organized as follows: Section II begins with a general discussion of the determinants of regional wage differences and then considers techniques for analyzing regional wage dispersion. Section III discusses regional wage determination in the Korean context and reviews the data available to this

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[1] For example, Williamson found evidence supporting a Kuznets' "U-Shaped" hypothesis for inter-regional growth. Regional inequality tends to first rise and then fall as per capita income increases. Fields and Schultz considered the independent contribution of location to the distribution of household income in Columbia. They concluded that after adjusting for differences in age and education, the effect of region, although significant, explained only a small percentage of the variance in household incomes.

structures might contribute to the spatial variation of wages. These forces may act in any given period to generate regional wage differences and, therefore, the rank ordering of regions by wage levels should not be expected to remain constant over time. However, over the course of economic development, as barriers to factor mobility ease, a competitive labor market might be expected to exhibit a secular trend toward compression in the regional wage structure.

In order to measure and compare regional wage dispersion over time a normalized index of wage variance must be computed. Relying on the coefficient of variation, C_t, one can compare the time path of dispersion in mean regional wages,[2] where

$$(1)\quad C_t = \sqrt{\sum_{r=1}^{n} \frac{(w_r - \bar{w})^2}{n}} \Big/ \bar{w} \qquad \text{for } t=1, \ldots, m$$

with n standing for the number of enumerated regions, m the time span being considered and $\bar{w}$ the mean regional wage.[3] This would be a suitable index if the wage data were for homogeneous categories of labor. However, available regional wage data generally reflect averages aggregated across workers and firms with different attributes. C_t, therefore, embodies differences in the inter-regional mix of worker skills, making C_t an imperfect index of regional wage differentials, *ceteris paribus*.

Recognizing the limitations of available data, an alternative approach is to first approximate the independent effect of region on wages for any given year, t, by specifying wages, w, as a func-

[2] The coefficient of variation was chosen as the measure of relative dispersion for this study rather than, for example, the variance of the log of income, because while the log of income is thought to be normally distributed, regional wages need not be similarly distributed. Second, since this study focuses only on price as opposed to any quantity dimension of the labor market, some of the indices commonly associated with analyses of income or wage inequality are not obviously more appropriate than is the coefficient of variation.

[3] Note that $\bar{w}$ is not the national average which would be equal to a weighted average of regional wages where the weights would reflect regional employment shares. Since the extent of wage arbitrage is of interest, employment weighted averages are not a preferred index in this context.

Seoul and Busan[6]. Given the overall ethnic, racial and religious homogeneity of the Korean people[7], regions are not a proxy, as they often are in other nations, for these potentially significant differences. Instead, resource endowments, accessibility and strategic importance are likely to be the major differentiating characteristics of Korea's provinces.

The Korean labor market is often thought to be a very fluid one. The illegality of most strike activity and the generally weak state of organized labor have limited the exercise of labor power on the supply side. Based on the success of an export promotion strategy, the demand for labor, reflected in average annual growth rates of employment in manufacturing of 8.6% between 1965-1980[8], has been strong. Direct government interference in the wage setting process has been minimal as wage and price guidelines have been indicative rather than mandatory, and the exercise of either national or regional incomes policies has been infrequent.

Data on regional wages over time is available from censuses of manufacturing. These censuses, which have been conducted since 1958, are based on mailed questionnaires to firms employing five or more workers. The responses are published using different aggregations including one which presents earnings, employment and other measures relevant to wage determination, by 2-digit industry codes for each province and special city. The data represent employment weighted averages for each of 9 industry groups in each of 10 enumerated regions[9]. (These observations will be referred to as industry-regions).

The dependent variable for this analysis, $w_{i,r}$, is the average annual earnings of production workers in industry i located in

[6] Korea is actually divided into 9 *do*, the additional province being the island of Jeju off the Southern coast. For the period under consideration, Jeju's population has never exceeded 3% of the nation's population and even smaller percentages of national employment in manufacturing. Because of Jeju province's extreme outlier status, both geographically and economically, it was excluded from the analysis.

[7] See Henderson.

[8] See Economic Planning Board.

[9] The current Korean SIC classification roughly conforms to standard international SIC codes. However, in 1958 a different classification system was used based on 20 industry groups. Also, in 1958, Busan was not enumerated as a special city, instead being reported with Gyeongsang Nam, the province in which it is situated. The sample size for 1958 used in the analysis below, therefore, is different from that of later years.

Korean production workers employed in manufacturing for selected years between 1958-1979, where

$$(3)\quad \bar{w}_r = \left(\sum_{i=1}^{j} w_{i,r}\right)/j \qquad \text{for } r=1, \ldots, 10$$

Table 1

MEAN REGIONAL EARINGS ($\bar{w}_r$) OF PRODUCTION WORKERS IN KOREAN MANUFACTURING (IN THOUSANDS OF CURRENT WON)

Province or Special City	1958	1967	1972	1975	1979
City of Seoul	27.9	58.8	188.3	383.3	1273.7
Busan City	n.a.	68.4	179.5	351.2	1182.0
Gyeonggi	23.3	70.4	197.2	400.2	1331.5
Gangweon	22.4	48.6	183.4	590.0	1421.5
Chungcheong Bug	16.2	59.4	188.8	479.3	1160.7
Chungcheong Nam	17.6	66.1	177.3	361.9	1127.0
Jeonla Bug	17.4	51.7	169.3	291.6	1138.5
Jeonla Nam	18.5	65.4	105.8	344.9	1333.6
Gyeongsang Bug	18.2	60.9	149.2	372.5	1269.5
Gyeongsang Nam	20.4*	66.6	174.5	479.0	1485.9
Mean	20.2	61.6	171.3	405.4	1272.7
Standard Deviation	3.7	7.2	26.5	86.9	122.8
Coefficient of Variation, C_t	18.5%	11.6%	15.5%	21.4%	9.7%

* Includes Busan City.

Source: Korean Reconstruction Bank (Seoul), *Final Report, Census of Mining and Manufacturing, 1958.* Economic Planning Board, Republic of Korea (Seoul), *Report on Mining and Manufacturing Census, 1967, 1972, 1975, 1979,*

with j equaling the number of enumerated industries in a given year. Without standardizing for any inter-regional differences in worker or firm attributes, relative dispersion, as measured by C_t,

Table 2

DETERMINANTS OF THE INTER-INDUSTRY-REGION EARNINGS STRUCTURE OF PRODUCTION WORKERS IN KOREAN MANUFACTURING SELECTED YEARS, 1958-1979

	1958	1967	1972	1975	1979
ln (K/L)	0.038	0.163*	0.141*	0.127*	0.096*
	(0.022)	(0.062)	(0.033)	(0.035)	(0.017)
SKILL	0.0031	0.015*	0.019*	0.013	0.004
	(0.0032)	(0.007)	(0.006)	(0.006)	(0.003)
MEN	0.0075*	n.a.	0.004*	0.004*	0.006*
FIRM	(0.0012)	n.a.	(0.002)	(0.002)	(0.001)
FIRM	0.00071	0.006*	-0.000	-0.003*	-0.001
	(0.0010)	(0.002)	(0.002)	(0.002)	(0.001)
Regional Dummy Variables**					
Seoul	0.46*	0.31	-0.02	0.14	0.17*
	(0.08)	(0.20)	(0.12)	(0.13)	(0.06)
Busan	n.a.	0.45*	0.00	0.14	0.08
		(0.20)	(0.10)	(0.13)	(0.06)
Gyeongi	0.23*	0.39*	0.06	0.10	0.08
	(0.08)	(0.20)	(0.10)	(0.13)	(0.06)
Gangweon	0.17*	-0.06	-0.08	0.23	0.01
	(0.08)	(0.20)	(0.10)	(0.13)	(0.06)
Chungcheong Bug	-0.13	0.04	0.01	0.34*	-0.05
	(0.08)	(0.19)	(0.10)	(0.13)	(0.06)
Chungcheong Nam	0.04	0.25	0.09	0.08	0.06
	(0.08)	(0.20)	(0.10)	(0.13)	(0.06)
Jeonla Nam	-0.01	0.09	-0.19*	0.12	0.01
	(0.08)	(0.20)	(0.10)	(0.13)	(0.06)
Gyeonsang Bug	0.003	0.16	-0.13	0.19	0.09
	(0.08)	(0.19)	(0.10)	(0.13)	(0.06)
Gyeonsang Nam	0.15	0.20	-0.00	0.20	0.08
	(0.08)	(0.19)	(0.10)	(0.13)	(0.06)
Constant	2.19	2.99	4.10	4.83	6.11
R^2	0.53	0.33	0.76	0.62	0.81
# Observations	159	90	90	89	90

(Standard errors appear in parentheses)
* Significant at the .05 level.
** Jeonla Bug is the omitted province.

dex of this changing dispersion. An alternative that is directly comparable with the evidence on unadjusted regional wage dispersion presented in Table 1 is to compute $\hat{C}_t$, the attribute compensated coefficient of regional wage variation based on the predicted values of regional earnings. Evaluating regional earnings using each sample's mean values for worker and firm attributes yields the predicted earnings of Table 3. Based on these findings, the total dispersion in the regional wage structure is seen to fall over time despite the fact that continuous changes in the relative wage positions of specific regions are taking place. In 1958, $\hat{C}_{58} = 18.6\%$, and $\hat{C}_t$ continues to steadily decline, aside from a small upturn between 1972-1975, reaching a low of 6.3% in 1979. A secular erosion in regional differentials is estimated to have been achieved with a reduction of two thirds of the variance of adjusted regional earnings being realized over the course of 20 years of Korean economic growth and development. The results can be considered to be consistent with the outcome predicted by

Table 3

PROJECTED REGIONAL EARNINGS ($\hat{w}_r$)
(IN THOUSANDS OF CURRENT WON)

Province or Special City	1958	1967	1972	1975	1979
City of Seoul	29.7	70.3	174.1	392.5	1414.6
Busan City	n.a.	80.9	177.8	392.5	1291.7
Gyeonggi	23.6	76.2	189.2	377.1	1294.3
Gangweon	22.2	48.8	164.5	429.5	1201.2
Chungcheong Bug	16.5	53.7	179.5	479.4	1133.3
Chungcheong Nam	19.5	66.2	193.8	370.4	1269.9
Jeonla Bug	18.8	51.6	177.5	341.2	1193.6
Jeonla Nam	18.6	56.3	146.8	384.7	1202.6
Gyeongsang Bug	18.8	60.5	155.9	412.6	1303.4
Gyeongsang Nam	21.7	63.0	176.7	416.8	1290.4
Mean	21.0	62.8	173.6	399.7	1259.5
Standard Deviation	3.9	10.7	14.3	37.7	79.1
Coefficient of Variation, $\hat{C}_t$	18.6%	17.0%	8.2%	9.4%	6.3%

1980, 474-475.

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