

**CHANGES IN TAIWAN'S COLLEGE WAGE PREMIUM, 1978-1997:
SUPPLY, DEMAND AND INSTITUTIONAL FACTORS**

Paul Helms
The College of William & Mary

And

William M. Rodgers III
The College of William & Mary

And

Joseph Zveglic
Asian Development Bank

July 1999

Rodgers is the Frances L. and Edwin L. Cummings Associate Professor of Economics. He is also an Adjunct Associated of the Humphrey Institute, University of Minnesota. Zveglic is an economist for the Asian Development Bank, and Helms is an undergraduate at the College of William & Mary. This paper has been prepared for 1999 Academy of Business and Administrative Sciences International Conference in Barcelona, Spain, July 12-14, 1999.

Abstract

Using data from the *Manpower Utilization Survey* from 1978 to 1997, we document a decline in the relative wages of Taiwan's college graduates, with the decline concentrated between 1987 and 1997. We find that a rapid increase in the supply of college graduates is responsible for the decline in their relative wages, especially between high-skilled college and high-skilled non-college educated workers. If the ending of martial law in 1987 contributed to the erosion in the relative wages of college graduates significant role it explains a portion of the decline in the wage differential between less-skilled college and less-skilled non-college educated workers.

1. Introduction

After narrowing during the 1970s, the wage differential between U.S. college and non-college educated workers expanded dramatically during the 1980s and early 1990s. Similar patterns have also been documented in most Organization for Economic Cooperation and Development (OECD) countries. General economic growth, changes in the supply of college-educated workers, and changes in institutional factors such as the minimum wage have all contributed to the changes in the wage differential between college and non-college educated workers. The presence of stronger institutions helped to moderate the changes in the European OECD countries.

Asian Newly Industrialized Countries (NICs) offer an additional set of countries in which dramatic changes in the wage differential between college and non-college educated workers have occurred. Researchers have begun to assess the role that economic growth, the growth in the supply of college educated workers and changes in institutions play in explaining changes in the wage structures of many of these countries.¹

In Taiwan, from 1978 to 1997, the wage differential between male college graduate and senior high graduates fell from 31 to 20 percent, with the largest decline occurring after 1987. The wage differential between college and middle school graduates fell from 72 percent in 1978 to 38 percent in 1997. For women, over the same period, the wage differential between college educated and senior high graduates fell from 39 to 30 percent and the advantage relative to middle school graduates fell from 54 to 46 percent.

Over this nineteenyear period, Taiwan has experienced strong, sustained and balanced economic growth. Real GDP growth averages 8 percent per year. Studies consistently show a positive link between economic growth and the relative wages of non-college educated workers. As a result, it should not be a surprise that the wage differential between Taiwan's college and non-college workers narrowed.

The government on Taiwan has been involved in the direction of the economy. Wade (1990) finds that government involvement was critical to the economic success of Taiwan and other developing countries in Asia. Government involvement has been significant, especially during the period of martial law, from 1949 to 1987. Until 1987, martial law banned the formation of any new political parties and gave the military wide censorship powers. Martial law also meant close scrutiny of any political or pseudo-political organization. The authorization of unions after 1987, along with the enforcement of the Labor Standards Act, may contribute to the decline in the wage differential between college and non-college educated workers.²

Throughout Taiwan's history, the government has shown a commitment to educational planning and development.³ Part of this commitment was a series of educational reforms, as well as systematic interaction of the government with business and educational institutions. Policies were implemented in such a way that the growth of the education system would closely match the changing requirements of the emerging economy. During the 1970's, compulsory education was dramatically expanded, especially for women. In addition, the attainment of science and engineering degrees was greatly encouraged (Woo 1991). These policies have changed Taiwan's educational distribution. In particular, since 1978, the supply of male college graduates doubled, and the supply of female college graduates more than doubled. The growth in the relative supply of college educated workers places downward pressure on the wages of college educated workers, leading to a narrowing in the wage differential between college educated and non-college educated workers.

Which of these factors explains the acceleration toward equality after 1987? This paper disentangles the impact that the ending of martial law had on the wage differential's narrowing from the impact the increase in the supply of college educated workers had on

the differential. We show that the increase in the supply of college graduates explains the post 1987 convergence in the wage differential between college and non-college educated workers. However, we do find that if martial law had an impact on the wage differential, it occurred between less-skilled college and less-skilled non-college graduate workers.

2. Data

The data come from Taiwan's *Manpower Utilization Survey*, an annual household survey conducted annually since 1978.⁴ An average of 55,000 individuals were surveyed in each year. The earnings sample consists of civilian non-farm employees aged 15 to 65 with positive reported earnings and hours worked, from 1978 to 1997. The sample contains an average 18,500 observations for each year. The sample was further restricted to new entrants, defined as men and women with 0 to 10 years of potential experience, yielding a sample size of approximately 4,600 observations for each year.

As a point of departure, we first present average and median monthly real wages by educational attainment. We create four categories: Primary school, middle school, senior high/vocational school, and junior college/college.⁵ Tables 1 and 2 show that the monthly wages of college educated men grew in both sub-periods, but at a slower pace in the post-1987 sub-period. The monthly wages of non-college educated men also grew in both sub-periods; however, they accelerated in the post 1987 sub-period.

For women, the pattern of convergence in the wage differential is less clear. This may be due to a variety of other changes in the labor market policy that were targeted toward all women beginning in 1987. Because our current methodology cannot directly account for these additional factors, we focus our attention on explaining the post-1987 convergence in the wage differential among men.

An implication of this faster growth in the monthly wages of non-college educated men translates into a narrowing of the wage differential. Table 3 presents for

selected years the wage differential in log points between college and non-college educated workers. Relative to men who completed middle school, the average wage of college educated workers fall by 0.17 in both sub-periods. At the median a different pattern emerges. The relative wage falls by 0.13 from 1978 to 1987 and by 0.19 from 1987 to 1997. A similar acceleration in the narrowing occurs between the wages of senior high men and college-educated men. At the mean, the differential remains stationary between 1978 and 1987 but narrows by 0.11 between 1987 and 1997. At the median the corresponding changes are 0.03 and 0.08. Among women, the wage differential between college and non-college educated workers falls over the 19 year period, yet the rate of convergence slows after the end of martial law.

Our task is to disentangle the roles that the end of martial law, GDP growth, and the increase in the supply of college graduates play in explaining the post-1987 decline in the wage differential between college and non-college educated workers. GDP growth can not explain the decline in the wage differential. Growth in average annual GDP slowed from 8.5 percent per year to 7.5 percent per year after 1987. Assuming that the positive link between economic growth and the wage differential between college and non-college educated workers remained, a slowdown in GDP growth would have contributed to a widening in the wage differential.

The increase in the supply of workers with at least a college education has excellent potential for explaining the decline in the wage differential. Table 5 and Figures 1 and 2 show that from 1978 to 1997, the educational attainment of population of Taiwan experienced substantial shifts. The shifts are characterized by a rapid decline in primary education completion rates complemented by an increase in senior high school, vocational school, junior college, and college completion rates. Men and women have similar patterns but with dissimilar starting and ending points. In 1978, 11 percent of

men were primary education holders, compared to 26 percent of women. Today, 99 percent of workers attain an education beyond the primary school level. In 1978, 16 percent of men completed junior college and college, but by 1997, this figure had doubled to 32 percent. For women, the number jumped by over 2.5 times from 12 to 32 percent. The acceleration in the supply occurs due to middle school graduates decisions to enroll and complete junior college and college programs. The shifts virtually mirror one another. Again, if large enough, these relative shifts could explain the decline in the post 1987 relative wage of college-educated workers.

3. Disentangling the Effects

To determine the extent to which the actual wage differential deviated from its predicted path, we compared the actual log wage differential, the average log wage for college graduates minus the average log wage of non-college graduates to the predicted log wage differential. The predicted log wage differential is estimated from a regression of the wage differentials on a constant term and linear time trend using data from 1978 to 1987. As a result the 1988 to 1997 predicted differentials represent extrapolations on what the differential would have been, had the 1978 to 1987 trend continued in the late 1980s and 1990s. The differences between the actual and predicted differentials from 1988 to 1997 are due to martial law's impact and/or the increase in the supply of college graduates.

To remove the impact of the increase in the supply of college graduates, we reconstruct the predicted log wage differential from a regression of the wage differentials on a constant term, the linear time trend, but also the share of college graduates, and the logarithm of Gross Domestic Product. The 1988 to 1997 predicted differentials now represent extrapolations of what the differential would have been, had pre-martial law trends in supply of college graduates and GDP growth continued. From 1988 to 1997, the

distance between the basic predicted differentials and the predicted differentials that account for the supply of college educated workers measure martial law's impact. Over the same period the distance between actual differentials and the predicted differentials based on the model that controls for the supply of college graduates measure the impact of the supply of college graduates on the wage differential.

Figures 3 and 4 present the results for men and women. The thin line plots the actual wage differentials. The bold straight-line plots predicted wage differentials based on 1978 to 1987 data using a linear trend. The dashed line plots the predicted wage differentials based on the trend from 1978 to 1987 which include the share of college graduates and Gross Domestic Product.

The figures show that the college-primary school wage differential remains at approximately 0.67 from 1978 to 1987. By 1997, the differential had fallen to 0.49, a 0.17 point reduction. The differential in 1997 of 0.49 is considerably lower than the 0.78 differential predicted based on the trend from 1978 through 1987. The figure illustrates that the actual decline in the wage differential occurs soon after the end of martial law and the acceleration in the growth in the supply of college graduates. The dashed line which plots the predictions controlling for growth in GDP and the supply of college graduates generate considerably larger wage differentials. In 1996, the differential is 0.72, only 0.05 points below the differential from the linear model and 0.24 above the actual differential.

If the distance between the two predicted differentials measures martial law's contribution, then 0.05, or approximately 17 percent of the decline in the differential can be attributed to martial law. If the distance between the actual and predicted differentials that include measures of college graduate supply and GDP capture the contribution of the

supply of college graduates, then 0.24, or 83 percent of the decline in the differential can be attributed to the growth in the supply of college graduates.

The results for the college-middle school wage differential are shown in Panel B of Figure 3. The wage differential falls from 0.72 to 0.55 from 1978 to 1987, and falls further to 0.38 in 1997. This differential of 0.38 is basically the same as the 0.37 differential, which the linear trend predicts. In years closer to the ending of martial law the actual differential ranges from 0.01 to 0.07 points below the prediction based on the linear trend. The dashed line which plots the predictions controlling for GDP growth and the supply of college graduates generate considerably larger wage differentials. In all years after 1987, this differential exceeds the differential based on the linear trend and the actual differential. This pattern indicates that the rapid growth in the supply of college graduates explains the wage differential's post-1987 decline.

Panel C of Figure 3 contains the results for the college-senior high school wage differential. The wage differential remains at approximately 0.31 from 1978 to 1987. After 1987, the differential falls to 0.21 and ranges from 0.03 to 0.13 below the predicted differentials based on the linear trend. The dashed line which plots the predictions controlling for growth in GDP and the supply of college graduates generate considerably larger wage differentials. In all years after 1987, the differential exceeds the differential based on the linear trend and the actual differentials. This pattern also indicates that the rapid growth in the supply of college graduates explains the post-1987 decline in the wage differential.

Figure 4 presents the trend analysis for women. From 1978 to 1987, the wage differentials trend downward in each comparison: 0.56 to 0.45 for the college-primary wage differential, 0.54 to 0.45 for the college-middle school wage differential, and 0.39 to .37 for the college-senior high wage differential. After 1987, the college-primary

differential falls to 0.40, the college- middle remains basically unchanged, and the college-senior high wage differential falls to 0.30. The post-1987 college-middle and college senior high actual wage differentials are typically below the wage differentials based on the linear trend model. The predictions controlling for growth in GDP and the supply of college graduates generate considerably larger wage differentials, virtually eliminating the possibility that the ending of martial had an impact on the relative wages of college graduates.

Instead of isolating the sources of the wage differential's decline using the mean, we now examine the relationship at different points in the wage distribution. These different points can be thought of as skill levels.

More specifically, we compare the wage gap between college and non-college educated workers who are at the median of their respective wage distribution and use these differentials as the dependent variables in the trend analysis. Making this switch leads to similar results shown in Figures 3 and 4. These results are shown in Panel A of Figures 5 to 10.

Describing changes in the wage differential between the 10th percentile (less-skilled) college and non-college educated workers and changes in the differential at the 90th percentile (high skilled) informs us as to whether the decline in the relative wages of college graduates was uniform across the distribution. Performing the trend analysis at each percentile allows us to assess whether the end of martial law and the increase in the supply of college graduates had different effects on relative wages. If the marginal college graduate tended to be higher skilled (possess above average wages), then the rapid increase in the supply of college graduates will exert greater downward pressure on the relative wage of the 90th percentile college graduate than on the relative wage of the 10th percentile college graduate. If martial law tended to benefit less-skilled non-college

educated workers, then there will be stronger upward pressure on the relative wage of the 10th percentile non-college graduate. To assess whether these differential effects exist, we substitute the time series of wage differentials at the 10th and 90th percentiles for the mean in the trend analysis.

We find support for these explanations. The increase in supply of college graduates had different effects on the relative wages of college graduates. Figure 5 plots the college-primary wage differentials for male workers at the 10th and 90th percentiles. Among the less-skilled, the college-primary differential is predicted to increase slightly after 1987, however, from 1987 to 1997, the premium declines actually falls from 0.62 to 0.43. The predictions based on the time trend, GDP and the percent of college graduates suggest that the ending of martial law explains one-half of the narrowing of the wage differential and the increase in the supply of college graduates explains the other half.

Among the high-skilled college and high-skilled non-college graduates, the increase in the supply of college graduates explains the entire post-1987 decline in the differential. The actual differential starts at 0.61 in 1978, falls to 0.53 in 1987 and ranges from 0.36 to 0.58 after 1987. All of the values are below the predictions based on the linear trend. Adding the percent of college graduates and GDP generates predicted differentials that exceed the predictions from the model based on the linear trend.

Figures 6 and 7 present the analysis of the college-middle school and college-senior high school differentials. The results are quite similar to the college-primary comparison. At the 90th percentile, the actual differentials fall below the linear trend. When the percentage of college graduates and GDP are added to the prediction model, the differentials exceed the values from the linear trend, again indicating that the increase in the supply of college graduates plays the dominate role in explaining the rapid decline in wage differentials after 1987.

Figures 8 through 10 present the analysis for women. The patterns are not as clear as for men. Again, we attribute this to the additional changes in the economy that started in 1987 which only impacted women. The 90th percentile consistently shows a decline in the actual wage differential below trend shortly after the end of martial law. This drop is fully explained by the rapid increase in the supply of college educated workers.

4. Summary and Conclusions

Changes in the structure of OECD wages have and continue to receive a great deal of attention from researchers and policy makers. In many of these economies the differential between college and non-college narrowed during the 1970s, but the pattern reversed itself during the 1980s and early 1990s. Labor supply, labor demand and institutional factors have all been found to contribute to the changes in the wage differential. In particular, changes in the supply of college graduates have played a prominent role and in European OECD economies, institutional factors have contributed to the changes.

Over the past twenty years, the structure of wages in many of Asia's Newly Industrialized Countries (NICs) have experienced dramatic changes. Researchers have begun to assess the role that economic growth, the growth in the supply of college educated workers and changes in institutions play in explaining changes in the wage structures of many of these countries.

This paper focuses on the experience of Taiwan. From 1978 to 1997, the wage differential between male college graduate and senior high graduates fell from 31 to 20 percent, with the largest decline occurring after 1987. The wage differential between college and middle school graduates fell from 72 percent in 1978 to 38 percent in 1997. For women, over the same period, the wage differential between college educated and

senior high graduates fell from 39 to 30 percent and the premium relative to middle school graduates fell from 54 to 46 percent.

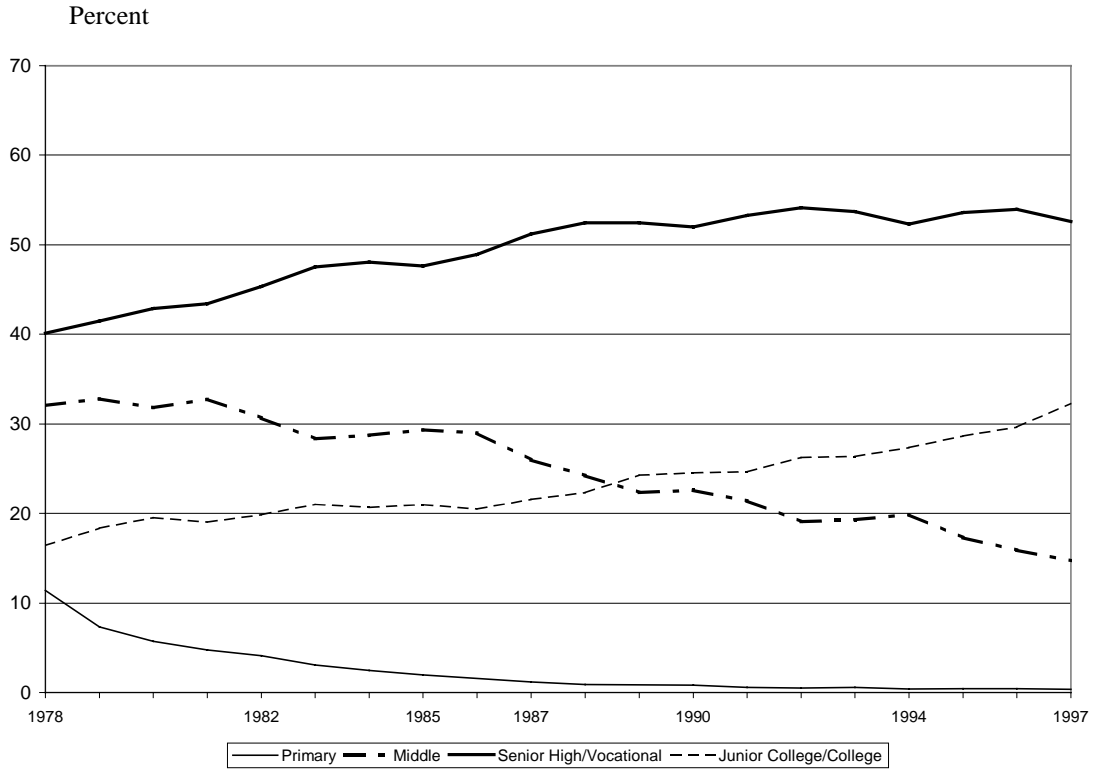
Over this nineteen-year period, Taiwan has experienced strong, sustained and balanced economic growth. Real GDP growth averages 8 percent per year. Taiwan's government has been involved in the direction of the economy. Government involvement has been significant, especially during the period of martial law, from 1949 to 1987. Until 1987, martial law banned the formation of any new political parties and gave the military wide censorship powers. Martial law also meant close scrutiny of any political or pseudo-political organization, such as unions. The government has implemented policies such that the education system would grow in a manner that closely matched the changing requirements of the growing economy. Starting in 1987, a dramatic increase in the supply of college graduates occurred.

Which of these factors explains the acceleration toward equality after the ending of martial law in 1987? This paper disentangles the impact that the ending of martial law had on the wage differential's narrowing from the impact the increase in the supply of college educated workers had on the differential. We show that the increase in the supply of college graduates explains the post 1987 convergence in the wage differential between college and non-college educated workers. However, we do find that if martial law had an impact on the wage differential's narrowing, it occurred between less-skilled college and less-skilled non-college graduate workers.

REFERENCES

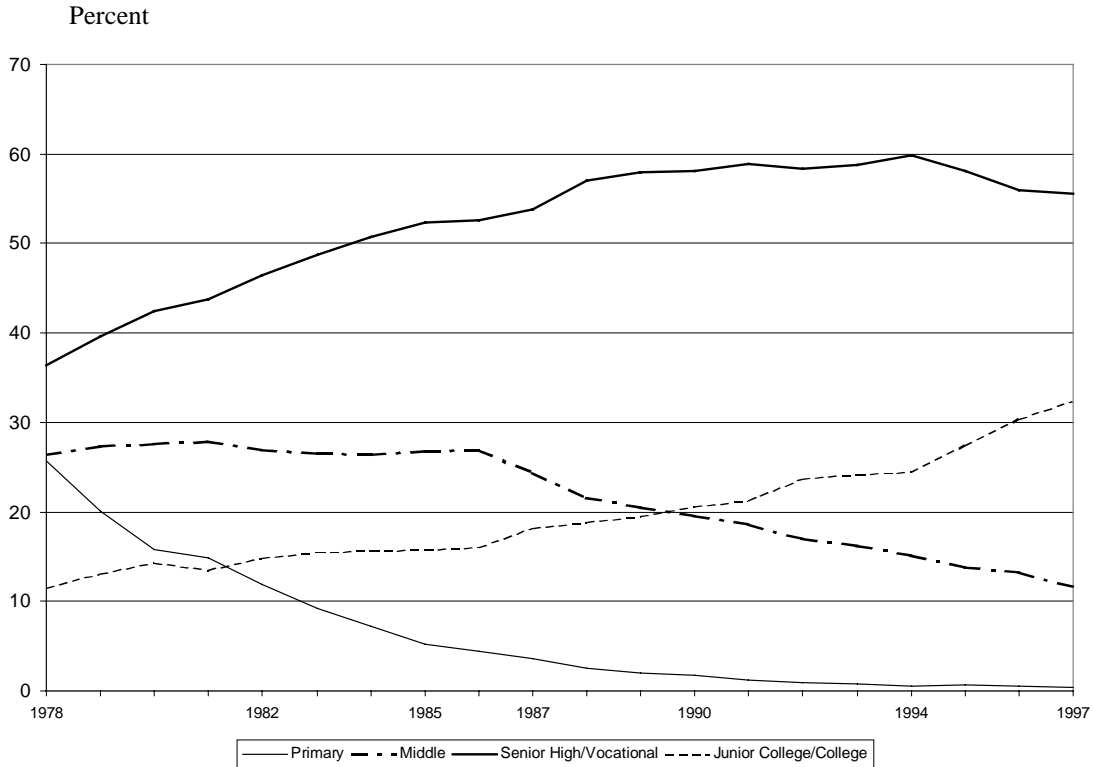
- Buchinsky, Moshe. 1994. "Changes in the U.S. Wage Structure 1963-87: Application of Quantile Regression." *Econometrica*, Vol. 62, No. 2 (March), pp. 405-58.
- Choi, K-S. (1996). "The Impact of Shifts in Supply of College Graduates: Repercussion of Educational Reform in Korea," *Economics of Education Review*, Vol. 15, No 1, pp. 1-9.
- Gindling, T.H. et al. 1995. "Changing Returns to Education in Taiwan: 1978-91." *World Development*, Vol. 23, No. 2 (February), pp. 343-56.
- Kennedy, Peter. 1992. *A Guide to Econometrics*. Cambridge: MIT Press.
- Kwark, N-S. and Changyong Rhee. (1993). "Educational Wage Differentials in Korea," *Seoul Journal of Economics*, Vol. 6, No. 1, pp.1-35.
- Lee, M-L, Ben-Chieh Liu, and Ping Wang. (1994). "Education, Human Capital Enhancement and Economic Development: Comparison Between Korea and Taiwan," *Economics of Education Review*, Vol. 13, No 4, pp. 275-288.
- Mincer, J. (1974). *Schooling, Experience and Earnings*. New York: National Bureau of Economic Research.
- Nam, Y-S. (1996). "Schooling and Changes in Earnings Differentials by Gender in South Korea, 1976-1991," *Economics of Education Review*, Vol. 15, No 3, pp. 245-258.
- Ryoo, J-K, Young-Sook Nam and Martin Carnoy. (1993). "Changing Rates of Return to Education over Time: A Korean Case Study," *Economics of Education Review*, Vol. 12, No 1, pp. 71-80.
- Tsai, Pan Long. 1995. "Foreign Direct Investment and Income Inequality." *World Development*, Vol. 23, No. 3 (March), pp. 469-83.
- Wade Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeton: Princeton University Press.
- Woo, Jennie. 1991. "Education and Economic Growth in Taiwan: A Case of Successful Planning." *World Development*, Vol. 19, No. 8 (August), pp. 1029-44.
- Zveglic, Joseph E., Jr. et al. 1997. "The Persistence of Gender Earnings Inequality in Taiwan, 1978-1992." *Industrial and Labor Relations Review*, Vol. 50, No. 4 (July), pp. 594-609.

Figure 1. Male Educational Attainment, 1978-1997



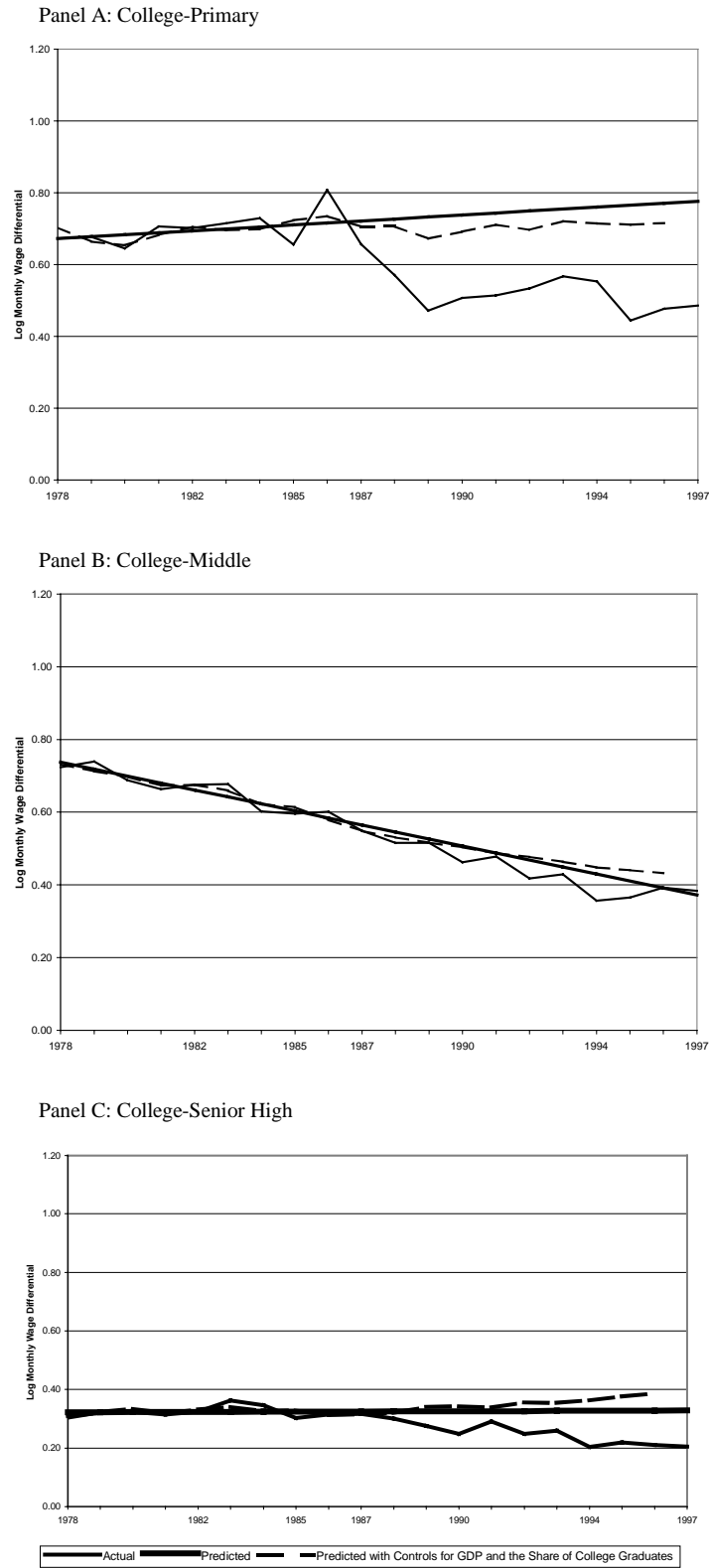
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 2. Female Educational Attainment, 1978-1997



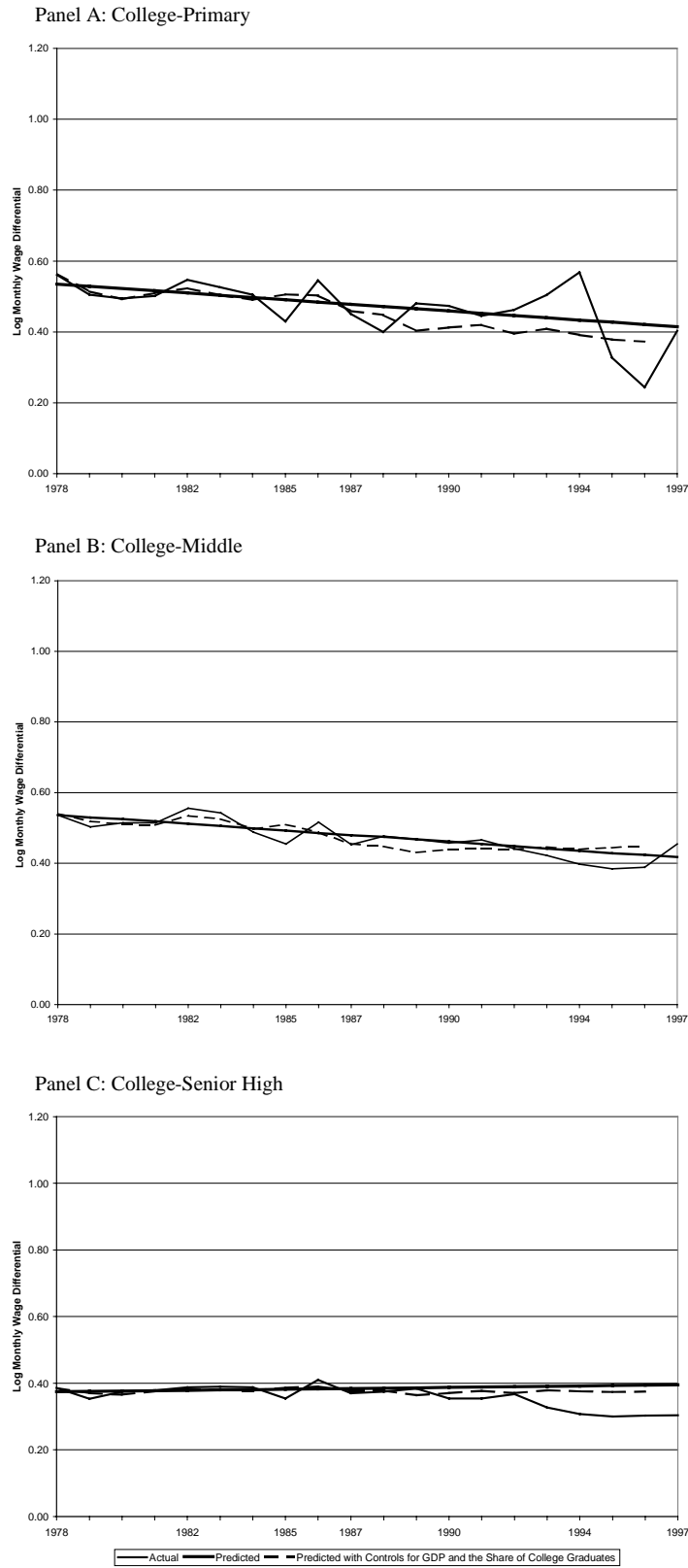
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 3: Male Average Monthly Wage Differentials, 1978-1997



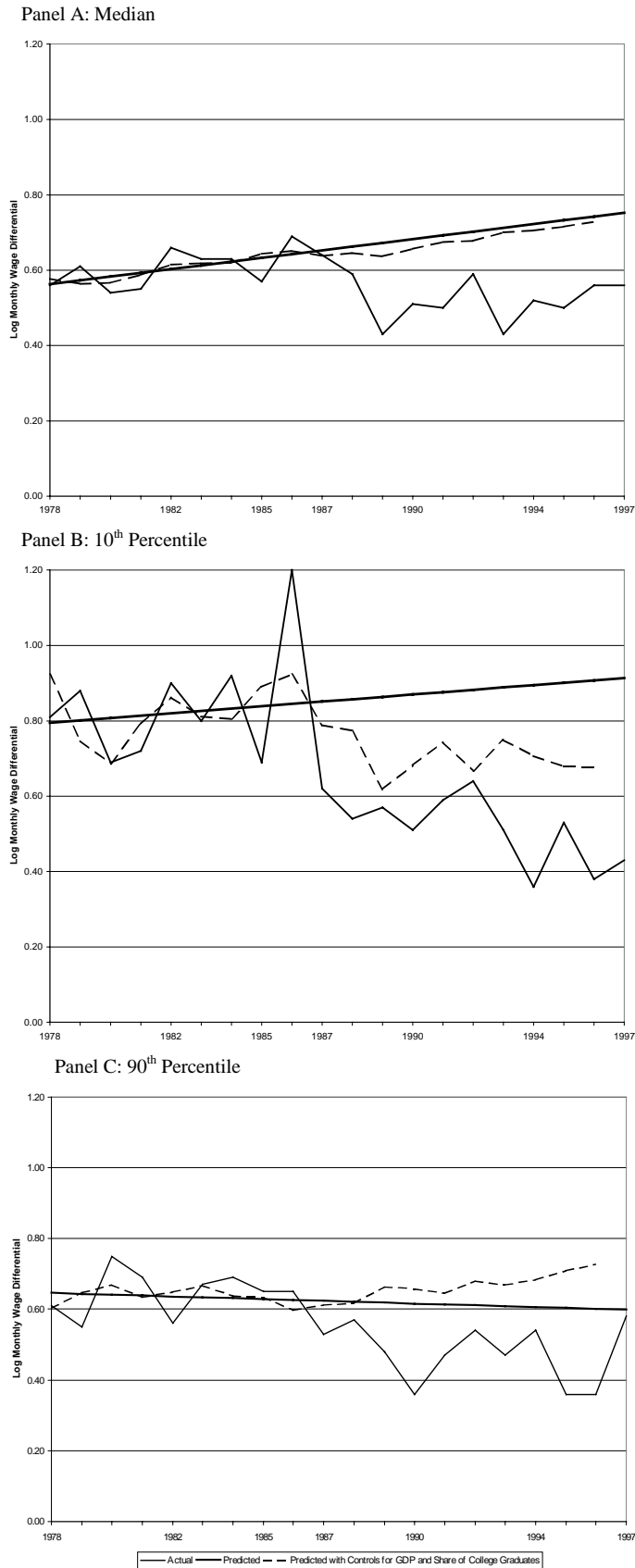
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 4: Female Average Monthly Wage Differentials, 1978-1997



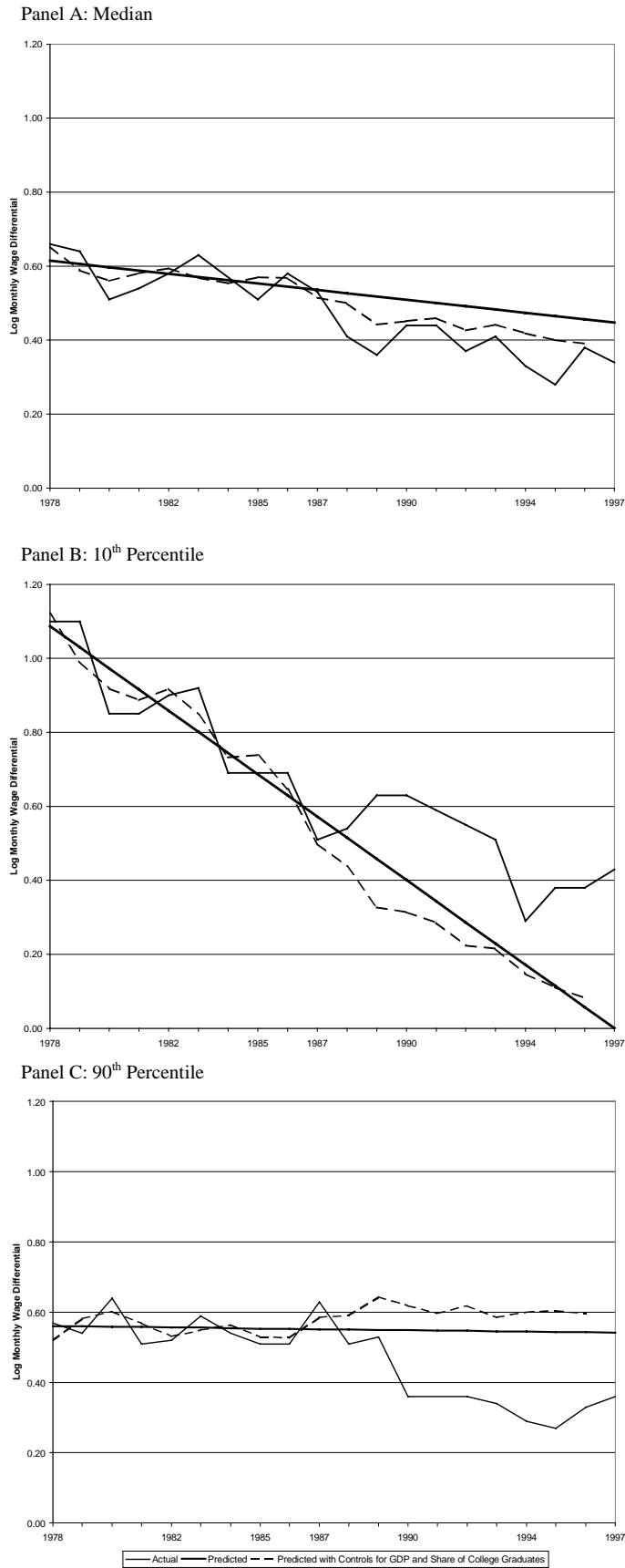
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 5: Male College-Primary Monthly Wage Differentials, 1978-1997



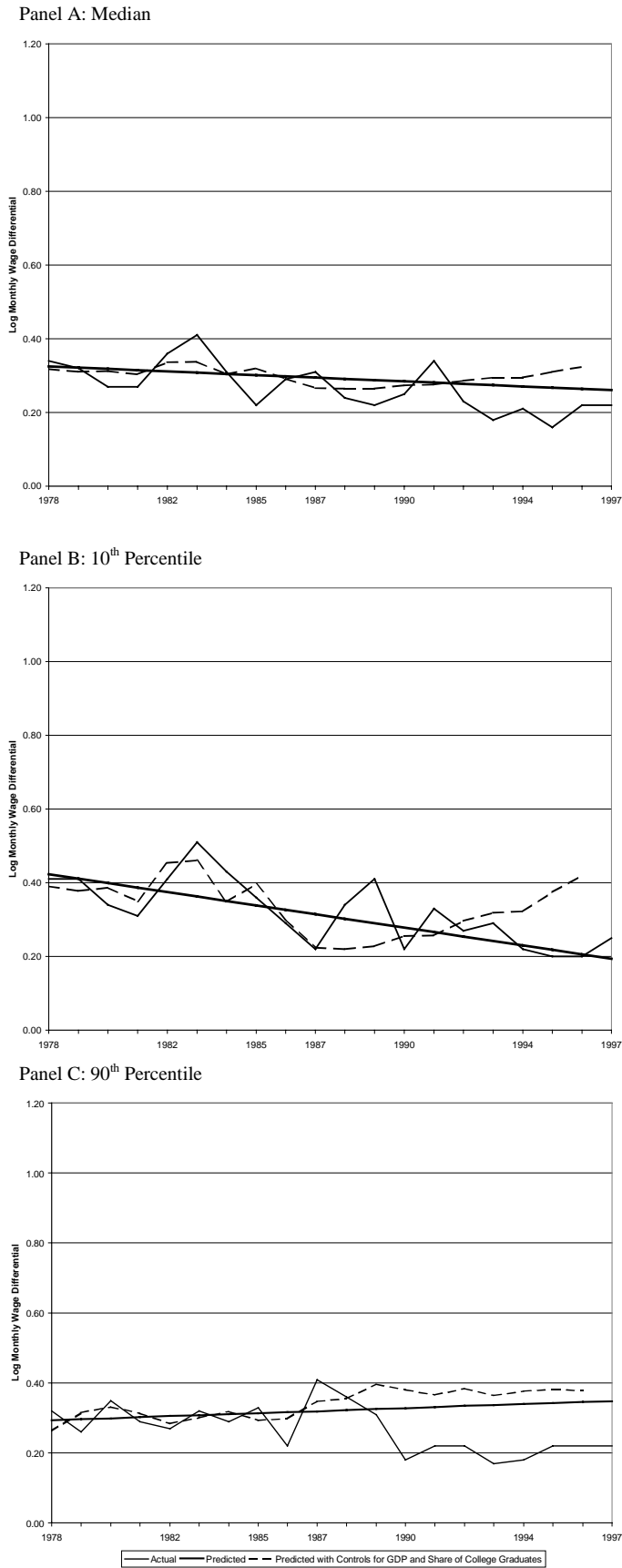
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 6: Male College-Middle Monthly Wage Differential, 1978-1997



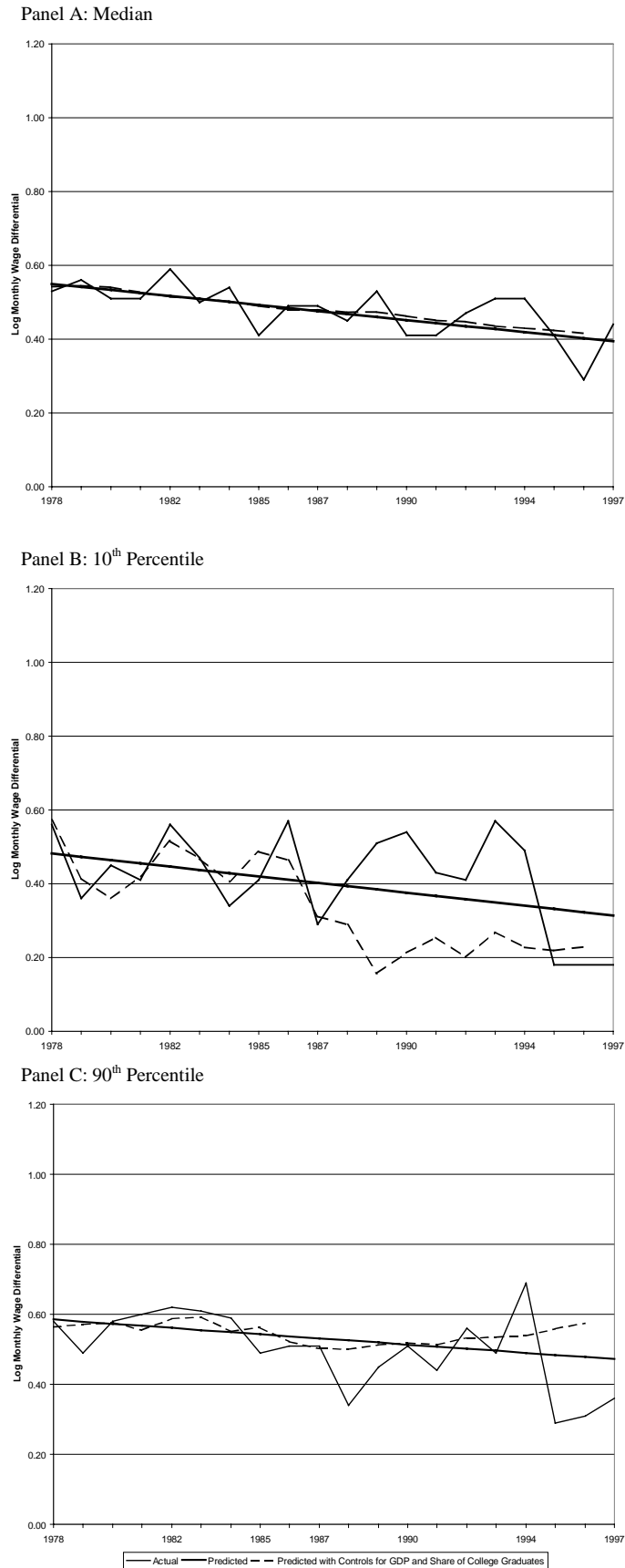
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 7: Male College-Senior High Monthly Wage Differential, 1978-1997



Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

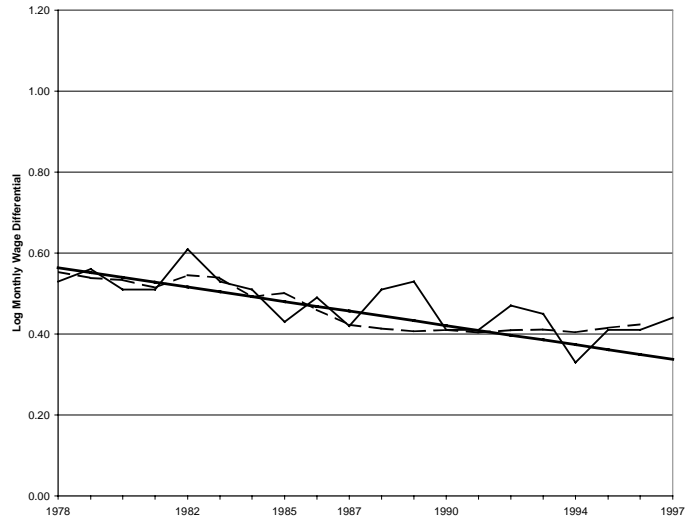
Figure 8: Female College-Primary Monthly Wage Differential, 1978-1997



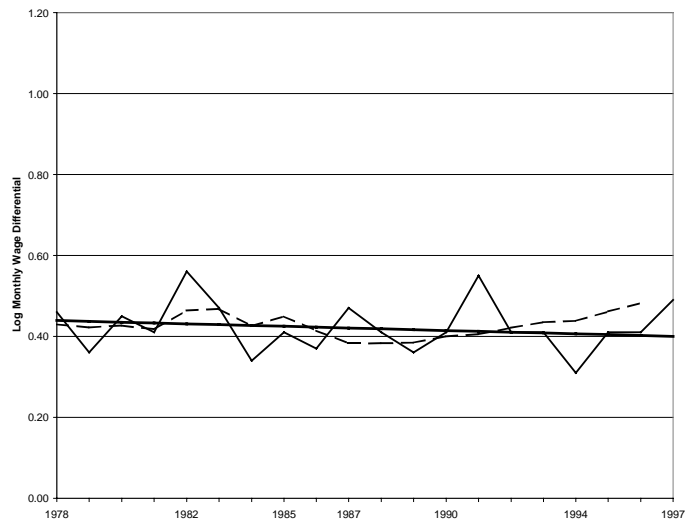
Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 9: Female College-Middle Monthly Wage Differential, 1978-1997

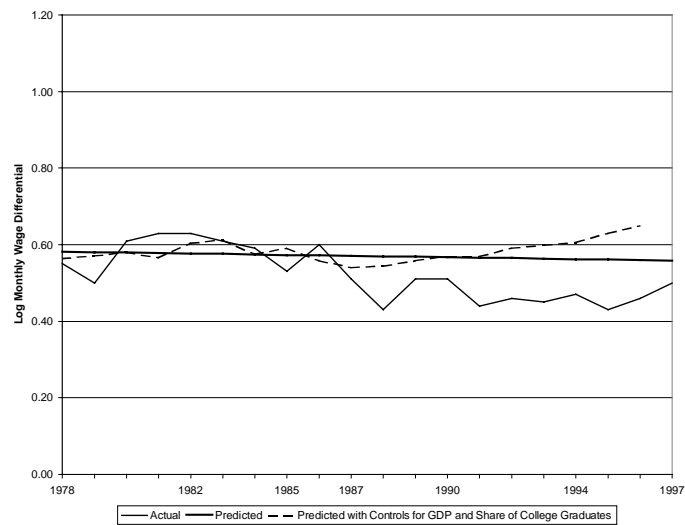
Panel A: Median



Panel B: 10th Percentile



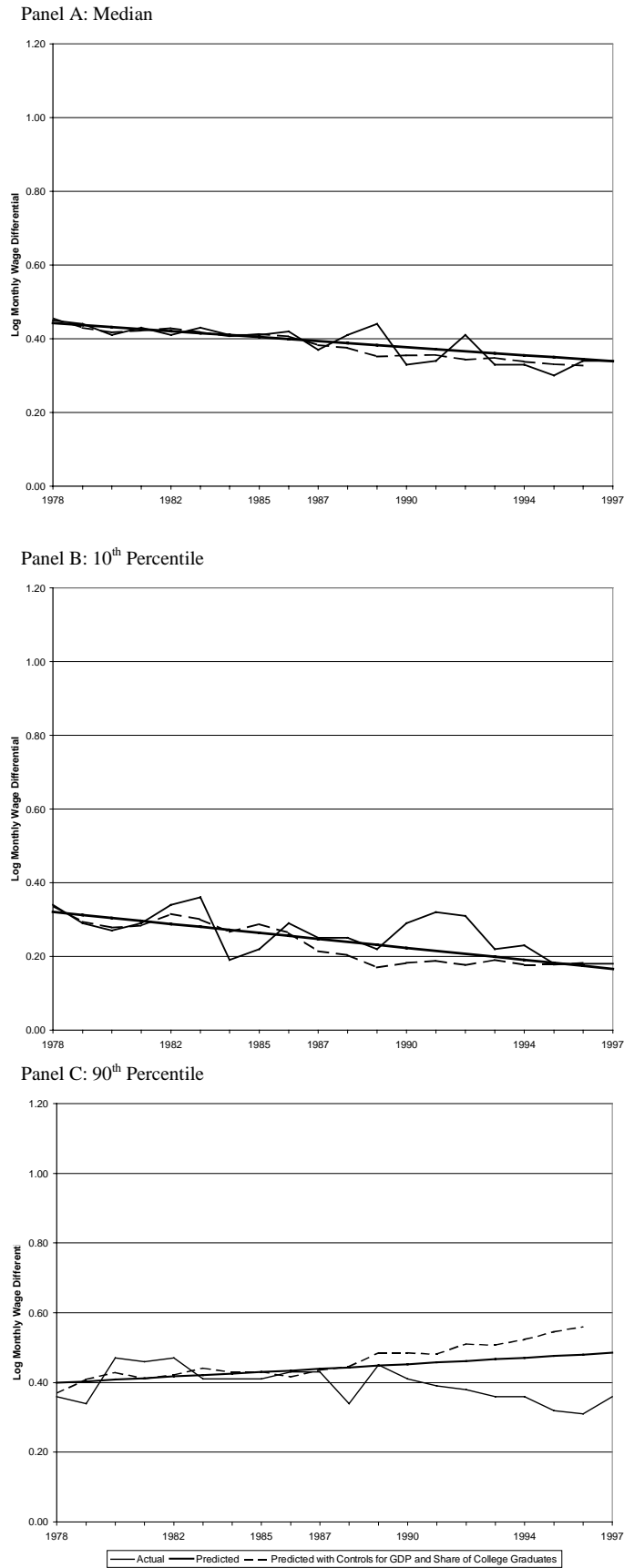
Panel C: 90th Percentile



— Actual — Predicted - - Predicted with Controls for GDP and Share of College Graduates

Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Figure 10: Female College-Senior High Monthly Wage Differential, 1978-1997



Source: Authors' tabulations from Taiwan Manpower Utilization Survey.

Table 1. Mean Logarithm of Real Monthly Earnings by Educational Attainment, Selected Years

| (1991 NT\$) | | | | | | |
|------------------------|------|------|-------|------------|------------|----------------------|
| Panel A: Males | 1978 | 1987 | 1997 | (1)1978-87 | (2)1987-97 | Difference (2) - (1) |
| All | 9.00 | 9.56 | 10.1 | 0.56 | 0.54 | -0.02 |
| Primary | 8.78 | 9.22 | 9.75 | 0.44 | 0.53 | 0.10 |
| Middle | 8.73 | 9.33 | 9.86 | 0.59 | 0.53 | -0.07 |
| Senior High | 9.15 | 9.56 | 10.04 | 0.41 | 0.47 | 0.06 |
| Junior College/College | 9.46 | 9.88 | 10.24 | 0.42 | 0.36 | -0.06 |
| Panel B: Females | | | | | | |
| All | 8.79 | 9.28 | 9.86 | 0.49 | 0.58 | 0.09 |
| Primary | 8.66 | 9.14 | 9.65 | 0.48 | 0.51 | 0.02 |
| Middle | 8.69 | 9.14 | 9.60 | 0.45 | 0.46 | 0.00 |
| Senior High | 8.84 | 9.22 | 9.75 | 0.39 | 0.52 | 0.14 |
| Junior College/College | 9.22 | 9.60 | 10.05 | 0.37 | 0.46 | 0.09 |

Table 2. Median Real Logarithm of Monthly Earnings by Educational Attainment, Selected Years
(in 1991 NT\$)

| Panel A: Males | 1978 | 1987 | 1997 | (1)1978-87 | (2)1987-97 | Difference (2) - (1) |
|------------------------|------|------|-------|------------|------------|----------------------|
| All | 9.08 | 9.57 | 10.12 | 0.49 | 0.55 | 0.06 |
| Primary | 8.90 | 9.24 | 9.72 | 0.34 | 0.48 | 0.14 |
| Middle | 8.79 | 9.34 | 9.94 | 0.55 | 0.60 | 0.05 |
| Senior High/Vocational | 9.12 | 9.57 | 10.05 | 0.44 | 0.49 | 0.04 |
| Junior College/College | 9.46 | 9.87 | 10.28 | 0.42 | 0.40 | -0.01 |
| Panel B: Females | | | | | | |
| All | 8.79 | 9.24 | 9.81 | 0.45 | 0.57 | 0.12 |
| Primary | 8.73 | 9.12 | 9.61 | 0.38 | 0.49 | 0.11 |
| Middle | 8.74 | 9.18 | 9.61 | 0.44 | 0.43 | -0.01 |
| Senior High/Vocational | 8.82 | 9.24 | 9.72 | 0.42 | 0.48 | 0.06 |
| Junior College/College | 9.27 | 9.60 | 10.05 | 0.34 | 0.45 | 0.11 |

Notes: Authors' tabulations from Taiwan Manpower Utilization Survey, 1978-1997.

Table 3: Trends in the Junior College/College Monthly Mean Wage Premia, Selected Years
(in Log Points)

| Panel A: Males | 1978 | 1987 | 1997 | 1978-87 | 1987-97 | Difference |
|------------------|------|------|------|---------|---------|------------|
| Primary | 0.67 | 0.66 | 0.49 | -0.02 | -0.17 | -0.16 |
| Middle | 0.72 | 0.55 | 0.38 | -0.17 | -0.17 | 0.01 |
| Senior High | 0.31 | 0.32 | 0.20 | 0.01 | -0.11 | -0.12 |
| Panel B: Females | | | | | | |
| Primary | 0.56 | 0.45 | 0.40 | -0.11 | -0.05 | 0.06 |
| Middle | 0.54 | 0.45 | 0.46 | -0.08 | 0.00 | 0.09 |
| Senior High | 0.39 | 0.37 | 0.30 | -0.02 | -0.07 | -0.05 |
| Notes: | | | | | | |

Table 4: Trends in the Junior College/College Monthly Median Wage Premia, Selected Years
(in Log Points)

| Panel A: Males | 1978 | 1987 | 1997 | 1978-87 | 1987-97 | Difference |
|------------------|------|------|------|---------|---------|------------|
| Primary | 0.56 | 0.64 | 0.56 | 0.08 | -0.08 | -0.15 |
| Middle | 0.66 | 0.53 | 0.34 | -0.13 | -0.19 | -0.06 |
| Senior High | 0.34 | 0.31 | 0.22 | -0.03 | -0.08 | -0.06 |
| Panel B: Females | | | | | | |
| Primary | 0.53 | 0.49 | 0.44 | -0.05 | -0.04 | 0.00 |
| Middle | 0.53 | 0.42 | 0.44 | -0.10 | 0.02 | 0.12 |
| Senior High | 0.45 | 0.37 | 0.34 | -0.08 | -0.03 | 0.05 |
| Notes: | | | | | | |

Table 5. Educational Attainment Distribution, Selected Years

| Panel A: Males | 1978 | 1987 | 1997 | (1)1978-87 | (2)1987-97 | Difference (2) - (1) |
|------------------------|------|------|------|------------|------------|----------------------|
| Primary | 11% | 1% | 0% | -0.10 | -0.01 | 0.09 |
| Middle | 32% | 26% | 15% | -0.06 | -0.11 | -0.05 |
| Senior High/Vocational | 40% | 51% | 53% | 0.11 | 0.01 | -0.10 |
| Junior College/College | 16% | 22% | 32% | 0.05 | 0.11 | 0.06 |
| Panel B: Females | | | | | | |
| Primary | 26% | 4% | 0% | -0.22 | -0.03 | 0.19 |
| Middle | 26% | 24% | 12% | -0.02 | -0.13 | -0.11 |
| Senior High/Vocational | 36% | 54% | 56% | 0.17 | 0.02 | -0.16 |
| Junior College/College | 12% | 18% | 32% | 0.07 | 0.14 | 0.08 |

Source: Authors' tabulations from Taiwan Manpower Utilization Survey, 1978-1997.

Endnotes

¹ For example, see Choi (1996), Ryoo, Nam and Carnoy (1993), Nam (1996), Lee, Liu and Wang (1994), and Kwark and Rhee (1993). These studies examine the role that economic growth, changes in labor supply and demand and institutions play in explaining Korea's structure of wages.

² It is well known in the labor literature that unions lower wage inequality, between union and nonunion workers, and within union workers.

³ The origin of Taiwan's strong economic base dates back to the Japanese administration of the island, pre 1949. Japan sought to develop Taiwan's economic base to further its international and domestic concerns. Taiwan, therefore, began with a stronger, more stable base than other developing countries.

⁴ Directorate-General of Budget, Accounting and Statistics, Executive Yuan, and the Council for Economic Planning and Development, Taiwan, Republic of China. The Chung-Hua Institution for Economic Research provided the data.

⁵ An excellent description of the Taiwanese educational system can be found in Woo (1991).