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Labor Unions and Income Inequality: Evidence from US States

P. Chintrakarn
Business Administration Division, Mahidol University International College,
999 Phutthamonthon 4 Road, Salaya, Nakhon Pathom, 73170, Thailand

Abstract: The United States witnessed two interesting distinctions. Labor union rates fell sharply in the 1980s while income inequality has been increasing since the 1980s. Understanding the underlying causes contributing to the marked increase in income inequality in U.S. is an important research and policy question. To analyze these phenomena, the paper employed state-level panel data on 48 states from 1988-2003 to estimate the impact of labor unions on U.S. states' income inequality. The results from using various econometrics models suggested that U.S. states' labor unionization rates defined as percent of employed workers covered by a collective bargaining agreement had negative and statistically significant effects on U.S. States' income inequality measure. The findings indicated that increased labor unions played a significant role in making income distribution more equal.

Key words: Income inequality, labor unions, economic development, labor economics, fixed effects model, random effects model

INTRODUCTION

The rising in income inequality has garnered a vast amount of attention from scholars as well as from policymakers as inequality has increased in both developed and developing countries over the past two decades. Systematic investigations on the determinants of income inequality suggested several factors that were found to be related to income inequality in the literature. At the beginning, most studies investigated the impact of international trade in which the results implied increases in international trade accompanied by rising in income inequality in most developing countries (Goldberg and Pavcnik, 2007) for a survey of country-specific evidence). While nations gradually became more financially integrated, concern over the impact of foreign direct investment on income inequality attracted considerable attention from scholars as well as policy makers. However, the empirical evidence yielded no consensus on the results (Choi, 2006; Driffield and Taylor, 2000; Feenstra and Hanson, 1997; Jensen and Rosas, 2007; Taylor and Driffield, 2005). The role of technology on income inequality became under intense scrutiny as industries and firms that emphasized more on research and development tended to employ relatively more high-skilled workers and spend a relatively larger share of their payrolls on the technology (Autor *et al*., 1998; Bartel and Sicherman, 1999; Berndt and Morrison, 1995; Berman *et al*., 1994).

The United States witnessed two interesting distinctions. Labor union rates fell sharply in the 1980s while income inequality has been increasing since the 1980s (Frank, 2009). Understanding the underlying causes contributing to the marked increasing in income inequality in U.S. is an important research and policy question (Farber, 2005; Freeman, 1980; Johnson, 1975; Western and Rosenfeld, 2011). Reducing income inequality is not only a fundamental goal of long-term economic development but a means to achieving the other development goals relating to poverty reduction as well. As emphasized in Western and Rosenfeld (2011), research on labor unions and inequality emphasized on two main effects. First, labor union increased wages among less-educated and blue-collar workers. Therefore, unions helped reduce educational and occupational inequality. Second, collective bargaining power of labor unions helped standardize wages within firms and industries. Hence, unions mitigated the inequality of wages among union members with similar characteristics. All together, these effects of unions implied the decline in union was associated with the increase in wage inequality.

The objective of this study was to reexamine the relationship between these two factors using novel and new data set. Building on this previous study, this study revisited the role of labor unions in affecting income inequality of U.S. states using panel data on 48 states from 1988-2003. The study aimed to contribute to the literature along several new dimensions. First cross-country comparisons of inequality were generally plagued by problems of poor reliability and inconsistent methodology. Goldberg and Pavcnik (2007) provided a nice discussion on problem often encountered in

cross-country comparisons of inequality. To cast light on this central issue, this study exploited newly available data on income inequality that produced greater methodological consistency in inequality measurements. The primary innovation of this data was to use IRS income tax filing data to construct a comprehensive state-level panel of annual income inequality measures.

Second, analyzing data on U.S. states helped alleviate the heterogeneity and data comparability problems often encountered in cross-country studies as a panel of U.S. states was more homogenous than most a panel of cross-countries data. As emphasized by Frank (2009), the greater homogeneity of state-level data helped mitigate the difficulty in adequately capturing structural differences across international panels of earlier studies such as Forbes (2000) and Barro and Lee (2001). Finally, this paper examined the impact of unions on income inequality by utilizing a comprehensive panel data which was relatively large in both cross-sections and time-series observations whereas the existing literature thus far has generally relied on few data sets that lacked of both coverage.

MATERIALS AND METHODS

Statistical analysis: To assess the effects of unions on U.S. states' income inequality, the study employed the following two-way fixed effects model which allows for the correlation between unobserved effects and each explanatory variable (Wooldridge, 2006):

$$Y_{it} = \beta_0+\beta_1 unions_{it}+control\ factors_{it}+\alpha_i+\gamma_t+timed\ trend+\varepsilon_{it},\ I = 1,..., 48;\ t = 1988, 1989..., 2003 \quad (1)$$

where, y (U.S. state's income inequality) is subscripted with i (U.S. state) and t (year). The model included series of dummy variables capturing both unobserved time invariant state-specific component, α_i and year-specific component, γ_t. In addition, the model also included time trend to control trend effect. The data covered 48 states observed for the period 1988-2003.

Equation 1 was estimated by using Ordinary Least Squared Method (OLS). The parameter of interest is β_1 which measures the impact of labor unions on income inequality. The hypothesis test on β_1 was based on the statistical significance at 10 and 5% levels. Under a strict exogeneity assumption on the explanatory variables, the fixed effects estimator is unbiased: Roughly, the idiosyncratic error γ_{it} should be uncorrelated with each explanatory variable across all time periods. The fixed effects estimator allows for arbitrary correlation between α_i and the explanatory variables in any time period. The other assumptions needed for a straight OLS analysis to be valid are that the errors ε_{it} are homoskedastic and serially uncorrelated (across t).

Data: For the dependent variable, Gini coefficient as measure of U.S. states' income inequality was obtained from (Frank, 2009). This income inequality measure was derived from tax data reported in Statistics of Income published by the Internal Revenue Service (IRS). The independent variable of interest was U.S. states' labor unionization rates defined as percent of employed workers who are covered by a collective bargaining agreement obtained from unionstats.com database constructed by Hirsch and Macpherson (2003). Several control factors which were considered to affect income inequality in the literature were included in the model. For example, per capita GSP (Gross State Product) and the squared of per capita GSP were obtained and calculated using data from Bureau of Economic Analysis (BEA). Data on U.S. states' international trade openness (Trade) defined as state export in percent of GSP and inward FDI-related employment intensity (FDI) which is the number of employees in foreign affiliates as percentage of state-level total employment were obtained from Statistical Abstract of the United States (various issues).

For technology capital stock, the Perpetual Inventory Method was applied to data on state-level new research and development expenditure (as share of GSP) obtained from Science and Engineering Indicators (various issues). Research and development expenditure included Research and development performed by federal agencies, business, universities, other nonprofit organizations and state agencies. The data on state-level research and development for years 1988, 1990, 1992, 1994, 1996, 2001 and 2003 are not available. To circumvent the problem, the state-level mean values as the proxy for missing data were used. Education measured by the proportion of the population with at least a collage degree were obtained from Frank (2009). Unemployment rates (%) for each state were obtained through U.S. Bureau of Labor Statistics. Financial development variables measured by share of Finance and Insurance (FIN) in US states in percent of GSP and net loans and leases (Loan) of Federal Deposit Insurance Corporation (FDIC)-insured commercial banks, balances at year end, in percent of GSP were obtained from BEA and FDIC.

RESULTS AND DISCUSSION

Summary statistics were provided in Table 1. Table 2 reported the estimation results. In term of control variables, the estimation of the model showed that

Table 1: Summary statistics

Variable	Year	Mean	SD	Min.	Max.
Gini coefficient	1988-2003	0.568	0.026	0.501	0.656
FDI	1988-2003	0.032	0.013	0.007	0.103
Trade	1988-2003	0.056	0.035	0.001	0.251
Technology	1988-2003	53.88	50	2.68	289.13
Per capita GSP	1988-2003	29400	5796	18173	55282
College (%)	1988-2003	14.54	3.36	6.86	25.48
Union (%)	1988-2003	15.08	5.74	3.8	31.70
Finance and insurance	1988-2003	6.82	4.05	2.37	33.54
Net loans and leases	1988-2003	40.35	46.79	1.14	381.27
State unemployment (%)	1988-2003	5.19	1.45	2.3	11.3

Notes: Author's calculation

Table 2: Estimation results

	Fixed effects model	Random effects model
Union	-6.24E-04**	-4.02E-04*
	-2.44	-1.78
FDI	5.66E-01**	4.27E-01**
	5.57	5.46
Trade	1.97E-02	2.14E-02
	0.83	0.97
Technology	-4.77E-05	-3.37E-05
	-1.39	-1.37
Per capita GSP	-1.05E-05**	-8.64E-06**
	-8.14	-7.36
Per capita GSP Sq.	1.55E-10**	1.38E-10**
	8.35	7.26
College	-5.98E-04*	-2.18E-04
	-1.87	-0.69
FIN	2.58E-04	-1.39E-04
	0.5	-0.27
Loan	6.65E-07	-3.83E-06
	0.05	-0.26
State unemp.	2.93E-04	6.67E-04*
	0.73	1.65

[1]State, year and trend effects are not reported.*and **and denote statistical significance at the 10% and 5% levels, respectively. t-statistics are reported under the estimates. We employ the robust estimator of variance

FDI-related employment intensity had positive and statistically significant impacts on U.S. states' income inequality measure while regarding trade and technology, estimates were not statistically significant. To be specific, the results suggested that one percent increase in FDI-related employment intensity was associated with an increase in Gini coefficient by 0.566 holding others constant. In term of the effects of economic development, coefficient estimates of per capita GSP and per capita GSP squared appear to be statistically significant with negative and positive signs, respectively. The results appeared to be in line with long-run positive relationship between inequality and growth found by Frank (2009). The estimation result also showed that education had negative and statistically significant impacts on U.S. states' income inequality measure. To be specific, the results suggested that one percent increase in proportion of the population with at least a collage degree was associated with a decrease in Gini coefficient by 0.000598 holding others constant. As for financial development, the results found no evidence of significant impact on U.S. states' income inequality measure. The results also indicated that unemployment had no significant effect on income distribution. Turning to the variable of interest, labor unions, the estimation result showed that labor unions had negative and statistically significant impacts on U.S. states' income inequality measure. To be specific, the results suggested that one percent increase in labor union rate was associated with a decrease in Gini coefficient by 0.000624.

That being said it was important to check the sensitivity of the finding. To check the robustness of findings, the random effects model was employed by assuming that the unobserved effect, α_i, in Eq. 1 is uncorrelated with each explanatory variables (Wooldridge, 2006). The results from using the random effects model were also reported in Table 2. The findings confirm the results found with the two-way fixed effects model. Labor unions had negative and statistically significant impacts on U.S. states' income inequality measure. To be specific, the results suggested that one percent increase in labor union rate was associated with a decrease in Gini coefficient by 0.000402.

CONCLUSION

This study presented empirical evidence on how labor unions were related to income distribution in a panel data set of US states from 1988-2003. The results from using various econometrics models suggested that U.S. states' labor unionization rates defined as percent of employed workers covered by a collective bargaining agreement had negative and statistically significant effects on U.S. States' income inequality measure. The findings indicated that increased labor unions played a significant role in making income distribution more equal.

REFERENCES

Autor, D.H., L.F. Katz and A.B. Krueger, 1998. Computing inequality: Have computers changed the labor market? Q. J. Econ., 113: 1169-1213.

Barro, R.J. and J.W. Lee, 2001. International data on educational attainment updates and implications. Oxford Econ. Papers, 53: 541-563.

Bartel, A.P. and N. Sicherman, 1999. Technological change and wages: An interindustry analysis. J. Political Econ., 107: 285-325.

Berman, E., J. Bound and Z. Griliches, 1994. Changes in the demand for skilled labor within U.S. manufacturing: Evidence from the annual survey of manufacturers. Q. J. Econ., 109: 367-397.

Berndt, E.R. and C.J. Morrison, 1995. High-tech capital formation and economic performance in US manufacturing industries: An exploratory analysis. J. Econ., 65: 9-43.

Choi, C., 2006. Does foreign direct investment affect domestic income inequality? Applied Econ. Lett., 13: 811-814.

Driffield, N. and K. Taylor, 2000. FDI and the labour market: A review of the evidence and policy implications. Oxford Rev. Econ. Policy, 16: 90-103.

Farber, H.S., 2005. Nonunion wage rates and the threat of unionization. Ind. Labor Relat. Rev., 58: 335-352.

Feenstra, R.C. and G.H. Hanson, 1997. Foreign direct investment and relative wages: Evidence from Mexico?s maquiladoras. J. Int. Econ., 42: 371-393.

Forbes, K., 2000. A reassessment of the relationship between inequality and growth. Am. Econ. Rev., 90: 869-887.

Frank, M.W., 2009. Inequality and growth in the United States: Evidence from a new state-level panel of income inequality measure. Econ. Inquiry, 47: 55-68.

Freeman, R.B., 1980. Unionism and the dispersion of wages. Ind. Labor Relat. Rev., 34: 3-23.

Goldberg, P.K. and N. Pavcnik, 2007. Distributional effects of globalization in developing countries. J. Econ. Literature, 45: 39-82.

Hirsch, B.T. and D.A. Macpherson, 2003. Union membership and coverage database from the current population survey: Note. Ind. Labor Relat. Rev., 56: 349-354.

Jensen, N.M. and G. Rosas, 2007. Foreign direct investment and income inequality in Mexico, 1990-2000. Int. Organ., 61: 467-487.

Johnson, G., 1975. Economic analysis of trade unionism. Am. Econ. Rev., 65: 23-28.

Taylor, K. and N. Driffield, 2005. Wage inequality and the role of multinationals: Evidence from UK panel data. Labour Econ., 12: 223-249.

Western, B. and J. Rosenfeld, 2011. Unions, norms and the rise in U.S. wage inequality. Am. Soc. Rev., 76: 513-537.

Wooldridge, J.M., 2006. Introductory Econometrics: A Modern Approach. 3rd Edn., South Western College Publishing, USA., ISBN-13: 9780324660548, Pages: 890.