

Do Industrial Relations Institutions Influence Foreign Direct Investment? Evidence from OECD Nations

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The potential impact of industrial relations institutions on economic outcomes has been a key element in analyzing the governing of the global workplace. We present case information and analysis that show that there are trade-offs between higher levels of economic outcomes and greater equity and employee voice associated with more and deeper labor market institutions. The estimates from the model show the impact of industrial relations system policies within a nation on a country's foreign direct investment (FDI) from other nations for the period 1985 through 2000 using data from nations that are members of the Organisation for Economic Co-operation and Development (OECD). Examples of the impact of major transformations in national industrial relations systems on FDI for UK and New Zealand also are presented. Our results show that higher levels of industrial relations institutions from the firms' perspective are usually associated with lower levels of FDI.

It (exchanging equity for efficiency) is, in my view, our biggest socioeconomic trade-off, and it plagues us in dozens of dimensions of social policy. We can't have our cake of market efficiency and share it equally.

Arthur M. Okun

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INDUSTRIAL RELATIONS, Vol. 46, No. 2 (April 2007). © 2007 Regents of the University of California
Published by Blackwell Publishing, Inc., 350 Main Street, Malden, MA 02148, USA, and 9600 Garsington
Road, Oxford, OX4 2DQ, UK.

Introduction

THE INFLUENCE OF LABOR MARKET INSTITUTIONS ON ECONOMIC OUTCOMES HAS GENERATED A GREAT DEAL OF ATTENTION from analysts and policy makers in the United States and other countries. An integral part of the issue for public policy analysis has been determining the appropriate level of labor market institutions. A central question has been what is the impact of labor market institutions on the potential equity versus efficiency trade-off that Arthur Okun referred to in the above quotation (Okun 1975)? Recent comparative analysis of the effect of labor market institutions on economic efficiency has argued that a holistic approach to institutions, one that includes not just a single factor but a whole group of laws and customs, may add to the ability of analysts to rank labor market institutions (Freeman 2000). Generally, these models assume that there are trade-offs between different types of labor market institutions and economic outcomes.

Often the controversy focuses on whether there are multiple equilibria with many different levels of labor market institutions leading to optimal levels of economic efficiency. Within one of these models, trading efficiency for equity (e.g., reducing income inequality) is small. Furthermore, introducing employee voice presents an additional element of the industrial relations system, which serves as a mediating factor between equity and efficiency (Budd 2004).

As part of this symposium, there is a further question whether the industrial relations institutions, including national levels of unionization, bargaining structure, voice-related public policies toward labor such as works councils, and the level (i.e., plant, industry, or national) at which collective bargaining takes place within nations have a large quantitative impact on economic factors involving globalization. Nevertheless, additional reasons or other labor-related factors can affect foreign direct investment (FDI) beyond the ones we could quantify. Therefore, we also did some qualitative investigations by tape-recording in-depth discussions with multinational chemical manufacturing managers in two companies using a structured set of questions. In addition, faculty and PhD students in Austria interviewed managers of similar companies in Germany. The dominant factors in the interviews for FDI were the opportunities in the product market in other countries. However, several of the managers in one U.S. chemical firm stated that they had an artificial intelligence system or equation where the industrial relations structure had explicit weights in the decision making. U.S. firms we interviewed saw labor costs and restrictions in their ability to allocate labor resources within an establishment or company as an impediment to efficiency, which needed counterbalancing by economic returns in the product market.

Other insights were gained from our interviews with auto and chemical executives for the European Union (EU). Managers were envious of the low levels of unionization the United States as well as the ability to hire and fire workers without consultation with unions or works councils. Moreover, one auto executive mentioned that threats to build new plants in low-union and low-wage regions of the United States were used to put pressure on local German unions. These interviews suggest that the economic opportunities offered in the United States to EU nations appear to be relatively more attractive than the potential profits offered to American firms in the EU. Although corporate decision makers on both sides of the Atlantic Ocean view labor costs as only a moderately important item, restrictions in Western Europe seem to encourage outflows of FDI and discourage investment by Americans. Unfortunately, this in-depth analysis of a small number of companies offered many conflicting statements that could only be reconciled by further analysis and data gathering. Based on these interviews and case studies, we further develop theoretically and empirically the role of industrial relations institutions on FDI.

The empirical analysis examines the economic impact of labor market institutions that affect wages, benefits, and the “voice” of workers in the labor market as well as policies that influence the allocation of labor. Specifically, we focus on the impact on FDI by national levels of unionization, bargaining structure, voice-related public policies toward labor such as works councils, and the level (i.e., plant, industry, or national) at which collective bargaining takes place within a nation. In the cross-country analysis we assume and model that FDI in a country takes place relative to investment in the host nation and in other sampled Organisation for Economic Co-operation and Development (OECD) nations.¹ The empirical analysis further examines foreign investment between nations over time. We also give examples of how a transformation in the industrial relations climate can influence FDI. We gather and use information on FDI outflows in countries with the fewest labor market restrictions relative to countries where labor market restrictions are much more widespread and limiting from management’s perspective. We extend traditional industrial relations research by providing a measure of industrial relations as a system. This approach may provide an underlying latent variable that will influence these economic decisions on investment.

¹ We recognize that investment also occurs in less developed countries, but that about 80 percent of all international FDI inflows occurred among countries we analyze in 2000 the end point of our analysis (World Investment Report 2001).

Background of Labor Market Institutions and FDI

Recent examinations of the impact of separate labor market institutions on measures of economic performance found that they have a small role to play when product markets are competitive (Nickell and Layard 1999; Botero et al. 2003). Another recent review of labor market institutions concludes that particular combinations of institutions may be as important as individual arrangements (Flanagan 1999). Consequently, the use of only one variable at a time, for example, union density, may not capture the full effect of labor market institutions on performance, even when product markets are relatively competitive. The use of an index may be an alternative method to capture the impact of industrial relations institutions on FDI.

Although research has examined the determinants of U.S. investment in other countries, little work has been done to compare the investment levels of the host relative to the receiving nation (Cooke 1997; Cooke and Noble 1998; Bognanno, Keane, and Yang 2005). One exception was the study by Budd and Wang (2004) that examine host and receiving flows of investment between Canadian provinces.

Since many industrial relations factors together are often perceived as an industrial relations system, we developed a single measure to capture these different elements into one variable consistent with the approach taken by John Dunlop (1993). The concept of an industrial relations system has been one of the basic tenets of this field dating to the mid-1950s with publication of John Dunlop's *Industrial Relations Systems* in 1960, (revised edition 1993). An overarching concept within the model was the view that parts and elements of labor-management relationships and related public policies toward labor are interdependent and may each affect other elements and the outcomes of the system as a whole (Dunlop 1993). Even prior to Dunlop, Sumner Slichter related that arrangements in the field of industrial relations may be regarded as a system in the sense that each of them more or less intimately affects each of the others so that they "constitute a group of arrangements for dealing with certain matters and are collectively responsible for certain results" (Slichter 1955). Within this systems approach, labor market institutions such as public policies, bargaining structure, law, and unionization would all be central elements of the industrial relations system. Consequently, any attempt to quantify the impact of industrial relations could be estimated as a single variable rather than as a variable holding the other factors constant. The interactions of these institutions have the potential to be as informative as each factor by itself. Similar to credit scores, which provide a composite of individual factors for use by financial analysts, a single value for the industrial relations system may

provide unique overall characteristics assessing how the value captures labor relations in a nation from management's perspective.

For cross-country analysis, data are available to develop index measures of labor market institutions and laws that affect the employment relationship (Chor and Freeman 2005). For example, estimates of union density are available at the cross-national level. The remainder of this study further develops the theoretical background, rationale, and evidence for the impact of industrial relations institutions on an economic outcome such as FDI.

Theory Background of Firm Investment Decisions in Foreign Countries

In order to develop a model of the role of labor market institutions on economic outcomes, we assume labor and the owners of capital attempt to engage in maximizing behavior. We include the impact of labor market institutions, which in our analysis is the industrial relations system, as the principal determinant of bargaining power.

At time period zero, a multinational firm invests capital based on their profit maximization condition. The firm can either import or invest abroad. Then at time period 1, the firm bargains the wage contract with workers. If the bargain succeeds, the firm produces products at their full capacity and pays the bargained wage that is influenced by the industrial relations system (Budd and Wang 2004). This implies that when a company makes investment decisions among locations that are identical except for the industrial relations system, it will invest more where the industrial relations system restrictions are fewer from management's perspective *ceteris paribus*. If we extend this model to include other capital and labor factors across countries, the reduced form approach to estimating this model would be of the following general form:

$$\text{FDI} = f(\text{cost of capital, labor costs(wage, industrial relations system), other factors}). \quad (1)$$

This theory is focused on the economic output aspects of FDI. We propose that countries also consider the industrial relations system in (1) to be an important determinate of the social stability of a nation. For example, industrial relations institutions affect income distribution, employee voice in the political system, and crime, which are all presumed to be elements of social well-being (Rees 1963; Freeman 1994; DiNardo, Fortin, and Lemieux 1996; Budd 2004). Consequently, a country may not want to engage in maximization behavior for only FDI at the expense of reducing the benefits of having a well-developed industrial relations system that also produces

greater income equality or employee voice, all of which are social goods. Thus, countries may consider both the industrial relations system and the outputs of the economy through the level of FDI, and choose an optimal amount of each “good.”

The Structure of the Industrial Relations System

In order to quantify the industrial relations system for a country, we assume that there is an underlying structure for the system that cannot be captured by any single variable; this assumption is consistent with industrial relations theory within the context of a systems approach. Furthermore, we also assume that there is an underlying structure that goes from a lenient industrial relations policy to a more restrictive one as measured from management’s perspective.² We further hypothesize that there is a structure to the industrial relations system that is linked in a hierarchical manner and provides a natural scaling of industrial relations characteristics in a nation. The degree or intensity with which those characteristics are implemented in a country forms the basis of firm decisions to invest in that nation. In order to develop the structure of the industrial relations variables, we create latent variables for the industrial relations factors in each nation. Each individual variable used in the index is divided into five categories to resemble a Likert-type scale, and the variables are ranked from lowest to highest in terms of their restrictiveness to employers. In order to examine the robustness of the impacts of this variable, we develop two measures. In the first case we use a summated rating scale of industrial relations system variables that includes the extent of union coverage, a measure of labor law restrictions on management, the degree of bargaining centralization and level of bargaining structure, and the extent of employee voice (Calmfors and Driffill 1988; Traxler and Kittel 2000). This summated rating scale is an additive linear one that measures the intensity of each of the factors and aggregates these into one variable (Bartholomew 1996). An alternative latent variable measure is the Rasch-type model that places each of the variables within a logical structure. The empirical measure of the Rasch model we use is known as a partial credit model, which is a nonlinear model that assigns weights that are consistent with an implicit structure to the industrial relations system. This approach assumes that the distance between parameters is equal and that the categories are equal integers (Wang 1997). The development

² We could also measure the industrial relations system from the union or workers perspective as (1-management’s measure) (see Chor and Freeman, 2005).

of the Rasch scale uses maximum likelihood estimation procedures to calculate a unique index for each country. Although not all of the factors that might go into a fully specified structural industrial relations system variable are identified, we can capture the major institutions that likely impact the industrial relations system using different weighting schemes and both linear (summated rating scale) and nonlinear measures (Rasch measures) of the system (Botero et al. 2003).

To further examine the statistical properties of the index, we investigate whether the full system index reduces the variance or the signal-to-noise ratio relative to using; for example, only two measures of the industrial relations system index (Huselid and Becker 1996). Using a bootstrapping technique with one thousand repetitions with replacement in the simulation over time, the results show that using all five industrial relations system variables greatly reduces the variance of the industrial relations system measure relative to using only two variables. For example, the variance for the nineteen OECD nations using only two variables is 0.63, but using all five variables reduces the variance to 0.34. Using the systems approach appears to reduce the statistical noise that comes from attributing industrial relations to only a couple of institutional variables in the industrial relations system. In a manner similar to the estimates of indices that affect firm performance, a single independent factor may not matter, but together the industrial relations system variables may impact economic outcomes (Ichniowski and Shaw 2003).

Measuring FDI

At the firm level, investment has been shown to be an economic measure that is highly responsive to the institutional characteristics of labor within the organization, which includes unionization (Hirsch 1991). By extension of these microeconomic results to the macroeconomic level, we anticipate that international investment decisions would also be responsive to country-specific labor market institutions (Prescott 1986). Even if FDI has some measurement problems in capturing “pure gross investment,” it does enhance the economic prospects within a country by, at a minimum, moving resources to their optimal use (Lipsey 2000). Direct investment capital flows are defined as equity capital, reinvested earnings, and other capital associated with various intercompany debt transactions and this comprises about 8 percent of international capital flows (Lipsey 2001). Although small relative to all forms of capital flows that include equity investment, FDI is still a large part of international financial transactions.

Analyzing investment patterns across countries assumes that companies are responsive to the economic characteristics of the home country relative to opportunities in the host country. Consequently, our measure of FDI used in hypothesis testing is total FDI from the i^{th} country to the j^{th} divided by the gross domestic product (GDP) in the i^{th} nation, consistent with other analyses of economic and industrial relations factors that impact U.S. FDI (Bognanno, Keane, and Yang 2005).³ An alternative measure of FDI that has been used when the unit of analysis is one-country outflows to other is FDI_{ij}/FDI_i . Given the potential changes in the industrial relations system over time on FDI, using FDI_{ij}/FDI_i might lead to difficulties in the interpretation of the coefficients, since relative changes in FDI flows to a country would not be distinguishable from the overall growth in FDI from the investing nation.

The use of this measure of FDI allows us to capture the relative flows of FDI between two nations based on economic differences and variations in institutions, such as the industrial relations system in a country. Our analysis includes nineteen OECD countries using annual data for sixteen years from 1985 through 2000.

Specifying the Empirical Model

Table 1 shows the variables used in the model, consistent with the economic and institutional variables from our reduced form equation (1). We present the variables used and sources of data for our model of the determinants of FDI. The composition of the industrial relations variable is presented, followed by the capital variables, labor market factors, product market determinants, and the other variables that have been shown to be important in labor market studies of FDI.

In order to calculate the values for each measure of the industrial relations system, we developed a 1 to 5 scale for each variable, indicating most (1) to least (5) favorable to business. The range of each variable was divided into quintiles, and a value was assigned based on where in the distribution each nation fell.⁴ For collective bargaining we used national union coverage, since countries like France have low unionization rates but a high percentage of coverage via the collective bargaining agreements for workers who

³ We also estimated the model using total direct foreign investment from the i^{th} country to the j^{th} divided by the total foreign investment in the j^{th} country and found results similar to those presented in Table 3.

⁴ We also divided each country into equal quintiles by both summated rating scales and Rasch estimates and found results similar to those presented in Table 3. These results are available from the authors.

TABLE 1
VARIABLE DESCRIPTIONS AND SOURCES OF DATA

Variables	Description	Sources
FDI	Investing countries FDI outflows divided by its GDP (i.e., from investing nation to destination country)	SourceOECD
Industrial relations system	Labor law index	Employment law index (1–5)
	Union density	Union density if available; otherwise union coverage was used (1–5)
	Bargaining level	National or sectoral level bargaining (1–5)
	Bargaining centralization	Degree of centralized bargaining (1–5)
	Worker representation	Worker's voice in the workplace (1–5)
	Industrial relations system	1 if they have similar IR system; otherwise 0
Interest rate differences	<i>Capital market factors</i> Yearly long-term interest rate difference between countries	SourceOECD
Tax rate (exports-imports)	Effective transnational tax rate Yearly country's trade balance lagged two years	OECD (1991) SourceOECD
Employee compensation differences	Labor market factors Yearly compensation difference between countries	SourceOECD
Unemployment rate	Yearly unemployment rate	SourceOECD
High school graduation rate	High school graduation rates for country	NCES
GDP per capita	<i>Product market factors</i> Yearly per capita GDP lagged 2 years	SourceOECD
Import percent of GDP	Host country's import as the portion of the host country's GDP lagged 2 years	SourceOECD
Language complementarities	<i>Other factors</i> 1 if they use same language; otherwise 0	
Distance between countries	Direct-line distances between countries	Fitzpatrick and Modlin (1986)

do not belong to a union.⁵ Since unions and works councils both influence the ability of managers to make decisions, we used a measure of the interaction of intensity of mandated employee representation in the country and the level of unionization (Freeman and Lazear 1995; Kleiner and Ay 1996). For our labor relations law index, we used an international index that includes laws on collective bargaining, workers' participation in the company's management, and collective disputes, which are then aggregated into one index (Botero et al. 2003). As part of our measures of the industrial relations system, we presented the level of bargaining centralization and coordination, which reflects whether there is establishment, local or national wage bargaining in a manner developed by Calmfors and Driffill (1988).⁶ Since we assume that countries with similar industrial relations systems may want to invest in nations that have similar or complementary industrial relations systems, we controlled for this interaction by adding a dummy variable for whether the sending and host nations have in the same quintile in the industrial relations system using the summated rating scale.

Using maximum likelihood estimation techniques produces a value normed at zero for the Rasch value of the industrial relations system. Our estimates for the partial credit model for the Rasch approach found results that are consistent with this scaling approach.⁷ Since there is no overriding statistical or theoretical reason to use only one approach, we presented both the summated rating scale and the Rasch values in most of our analysis. Statistically, these measures of the industrial relations system are highly correlated. For the composite index measure we found that Cronbach's alpha measure of the intercorrelation of the industrial relations variables was 0.74, which was well beyond the acceptable statistical threshold of 0.60 for the intercorrelation of these variables (Nunnally 1978). Table 2 shows

⁵ We also used the percentage of union membership in our estimates and found little differences in our results presented in the subsequent tables.

⁶ In this context, the Calmfors and Driffill index of the industrial relations system is of the degree of centralization of bargaining, whereas the Traxler and Kittel index modifies the Calmfors and Driffill index to include the coordination of bargaining of national and local labor market objectives.

⁷ Each of the factors of an industrial relations system that are in each of the countries in our sample are scaled by the intensity of use of those factors. A higher value means that a factor would reduce the likelihood that FDI would occur in a particular nation. If there is a single dimensional ordering for the four industrial relations system variables, no country would have a more advanced or intense level of a policy without also having a lower practice. Our data fit this pattern reasonably well, but not perfectly. For example, nations that have high levels of union coverage are more likely to have most of the other practices, and twelve nations have this practice with at least one other high-intensity practice, which is the highest value for all the system factors (Freeman, Kleiner, and Ostroff, 2000). No other industrial relations system variables have more other high-intensity levels of industrial relations coverage. When values were generated using factor analysis, an alternative approach but without a clearly defined structure, the analysis found that all of these factors were highly intercorrelated.

TABLE 2
CORRELATION AMONG INDUSTRIAL RELATIONS SYSTEM VARIABLES

	Union coverage	Bargaining centralization	Bargaining level	Worker representation	Labor law restrictions
Union coverage					
Bargaining centralization	0.527				
Bargaining level	0.430	0.682			
Worker representation	0.680	0.799	0.681		
Labor law restrictions	-0.125	-0.033	0.166	-0.102	

the simple correlations of the industrial relations system variables. They are generally highly correlated, except for the labor law index. We nevertheless included the variable since it has theoretical importance for the industrial relations system and is likely to impact FDI decisions.

Industrial Relations Institutions, Income Inequality, and FDI

Figure 1 shows the basic country relationships between our measures of industrial relations institutions and income inequality as measured by the

FIGURE 1
INDUSTRIAL RELATIONS SYSTEM AND INCOME INEQUALITY USING THE GINI COEFFICIENTS



Gini coefficients. The measure of the industrial relations system is the summated ratings' value for each nation. Consistent with findings in other studies, the slope of the line is negative, suggesting that numerous and more intense levels of industrial relations institutions are associated with less inequality in the country (DiNardo, Fortin, and Lemieux 1996). We anticipate that analysis with more statistical controls and econometric modeling may change the basic relationship. Nevertheless, this result is suggestive of the basic equity–efficiency trade-off of industrial relations institutions cited by Okun (1975) in the opening comment to this article.

Figure 2 presents the basic relationship between FDI outflows to other countries as a percentage of total outflows from the United States and from Germany for 1990, an early data point in our time series for which data are available. The vertical axis shows FDI outflow that go to other nations, and the horizontal axis presents the nation's industrial relations summated rating scale value. Estimates for both the United States and Germany show a negative slope. Germany, which has a restrictive industrial relations system, and the United States, which has the least restrictive policies, are both more likely to choose to invest in other nations with less rigid institutions, as the interviews with German manufacturing executives suggested. These results, however, fail to control for many of the covariates that are likely to affect FDI.

Estimates from the FDI Model

Table 3 gives reduced form random effects regression estimates of the equation specified above using yearly data for the countries in our analysis.⁸ This specification is consistent with the theoretical model using industrial relations as a determinate of FDI. We chose to use the ratio of FDI outflows to GDP in the host country rather than outflows to total FDI because of the potential simultaneity bias that using the latter measure might cause in statistical estimation. In columns 1 and 2 we give the specifications of using both the summated rating scale and the Rasch estimates. In columns 3 and 4 we present the quadratic form of the specification by giving the

⁸ We also used panel-corrected standard error estimates for FDI country-specific outflows relative to total outflows. This approach estimates the coefficients using OLS and their standard errors with corrections to allow for heteroskedasticity, cross-panel heteroskedasticity, and panel-specific autocorrelation. In our model the number of cross-section observations is larger than time-series ones. Consequently, we cannot use GLS with this error structure. As a result we used panel-corrected standard error estimates found in several standard econometrics software packages. These additional estimates showed similar results to those shown in Tables 3 and 4 and are available from the authors.

FIGURE 2
 FDI OUTFLOWS AND THE INDUSTRIAL SYSTEM RELATIONSHIPS IN 1990
 (USING THE SUMMATED RATING SCALE BY COUNTRY)

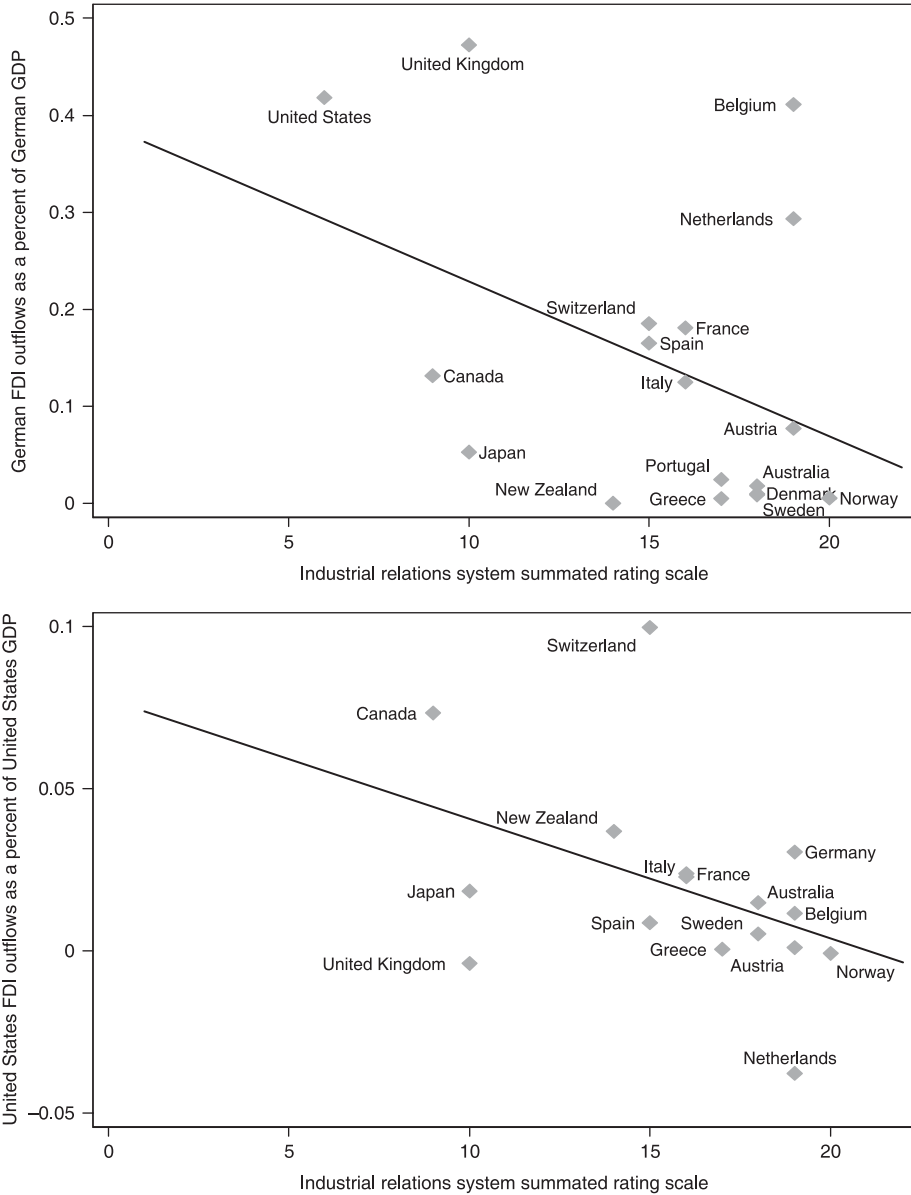


TABLE 3

GLS ESTIMATES OF THE IMPACT OF THE INDUSTRIAL RELATIONS SYSTEM ON FDI OUTFLOWS AS
A PERCENTAGE OF INVESTING COUNTRY'S GDP (1985–2000)

	(1)	(2)	(3)	(4)
Recipient country IR system (Summated rating) (Summated rating) ²	-0.010** (0.002)		-0.080** (0.013) 0.003** (0.000)	
Recipient country IR system (Rasch) (Rasch) ²		-0.047** (0.007)		-0.195** (0.035) 0.0310** (0.0061)
Language complementarities	0.126** (0.029)	0.118** (0.030)	0.092** (0.023)	0.079** (0.022)
IR system complementarities	0.062** (0.013)	0.063** (0.013)	0.077** (0.014)	0.073** (0.013)
High school graduation rate ^a	0.001** (0.000)	0.002** (0.000)	0.001** (0.000)	0.001** (0.000)
Distance between countries	-0.008** (0.001)	-0.008** (0.001)	-0.008** (0.001)	-0.007** (0.001)
Employee compensation differences	0.003** (0.001)	0.003** (0.001)	0.002** (0.001)	0.001 (0.001)
Unemployment rate	0.001 (0.001)	0.001 (0.001)	0.003** (0.001)	0.003** (0.001)
Interest rate differences	0.004** (0.002)	0.004** (0.002)	0.004** (0.002)	0.004** (0.001)
Tax rate	-0.033** (0.004)	-0.033** (0.004)	-0.027** (0.004)	-0.027** (0.004)
GDP per capita ⁽¹⁻²⁾	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
(Export-import) ⁽¹⁻²⁾	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Import percent of GDP ⁽¹⁻²⁾	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Constant	0.289** (0.056)	0.249** (0.055)	0.679** (0.101)	0.338** (0.065)
No. of observations	3800	3800	3800	3800

NOTE: Standard errors are in parentheses. All results include year dummies and are corrected for panel heteroscedasticity and panel-specific auto-correlation.

^aAverage over various years.

**Significant at the 5% level.

*Significant at the 10% level.

variable and its squared term for both the summated rating scale and the Rasch estimates. We have year and country random effects on FDI, and our sample size of 3800 observations are based on i to j movements of FDI with adjustments for purchasing power parity (PPP) for the specific country

from 1985 through 2000.⁹ We use annual values of FDI in our estimates.¹⁰ We also estimated a similar model using FDI inflow as a percentage of all GDP in the sending country and found basically the same qualitative results as presented in Table 3.¹¹ Furthermore, these results for large and small countries are similar to estimates developed for large trading blocs of developed countries like the United States and the European Union, suggesting that the results are not driven by the size of a country (Kleiner and Ham 2002).

The economic variable covariates included in our model of FDI are the same as those specified in Table 1. They include labor market variables such as education measured by the percentage of the workforce that completed high school, nonpublic-sector compensation differences between the two countries, interest rate differences, lagged imports minus exports divided by gross domestic product, relative tax rate, measures of industrial relations complementarities between the host and receiving countries, and the unemployment rate. As a measure of the product market in the country, we include a measure of lagged GDP per capita and lagged the measure by imports as a percentage of GDP. Other controls in our estimates that are constant over time include whether the nations with FDI outflows had the same native language, and the distance in miles between the capitals of the two countries.

The estimates show that the summated rating scale and the Rasch measures of the industrial relations system are statistically significant in all of the specifications, and negatively related to FDI flows.¹² In the quadratic specifications, the squared term is positive and statistically significant, suggesting that there is a positive relationship or at least a flattening out of the negative relationship between the industrial relations system and FDI at higher levels of industrial relations institutions. The significance of the quadratic variable suggests the existence of multiple equilibria, such that

⁹ Since there is some controversy about the use of PPP for normalizing economic variables, we estimated models using both adjusted and unadjusted values and found qualitatively similar results. These results are available from the authors.

¹⁰ Our estimates include countries with missing FDI. However, estimates replacing these missing values as zero showed no qualitative differences in the results. We also estimated our model using three-year moving averages for the economic variables as a statistical smoothing technique, and this result shows similar qualitative results.

¹¹ We also estimated single country by year and single year by country models using the same model as in Table 3, and found consistent results for almost all countries for almost all years. These estimates are available from the authors.

¹² When available we used the percentage of employees covered by collective bargaining agreements. However, when this information was not available we used the percentage belonging to a union in the country, and denoted this with a dummy variable in our statistical analysis (Little and Rubin, 1987).

TABLE 4

IMPACT OF THE SINGLE INDUSTRIAL RELATIONS SYSTEM VARIABLE ON FDI OUTFLOWS AS
A PERCENTAGE OF INVESTING COUNTRY'S GD (1985–2000)

	Union coverage	Labor law restrictions	Bargaining centralization	Bargaining level	Worker representation
Coefficients	–0.014** (0.003)	–0.018** (0.004)	–0.042** (0.005)	–0.034** (0.004)	–0.050** (0.007)

NOTE: Standard errors are in parentheses. All results include all the variables used in Table 3.

**Significant at the 5% level.

nations with the highest level of IR measures may have greater FDI than those in the middle range. However, those with the lowest values of an IR system maintain their advantage in receiving larger relative values of FDI. These general results are similar to those found for the impact of labor variables for U.S. FDI outflows (Cooke and Noble 1998; Bognanno, Keane, and Yang 2004). Moreover, the coefficients for the other control variables are consistent with other studies of FDI that focus on the effects of interest rates, taxes, education, product markets, or exports and imports (Summers, Gruber, and Vergara 1993).

In order to test for the robustness of the estimates in Table 3, we estimate in Table 4 each of the variables in the industrial relations system separately, with the same control variables as in Table 3. The results show that all five variables are significant and of the hypothesized sign. However, the coefficients differ greatly in their quantitative impact. In contrast, using the index and removing one of the variables show moderate variation but consistent results of the IR system on FDI (see Appendix B). The results show that the characteristics of the industrial relations system usually matter for FDI when estimating the values separately or with a systems approach, but there is no dominant variable.

As an additional way of developing a counter-factual estimate of the impact of a change in the industrial relations system, we estimated the impact for each of the nations in our sample if they adopted similar elements of the U.S. industrial relations system (See Table 5). Using the parameters from the Table 3 estimates, we found that annual FDI inflow relative to GDP would increase for each nation.¹³ The results of moving to

¹³ We also estimated a similar model for U.S. states and found that ones with higher industrial relations system values have modest negative impacts on measures of economic outcomes like capital expenditures, employment, and gross state product, perhaps because of the smaller variation in cross-state measures of industrial relations systems relative to cross-country variations. These results are available from the authors.

TABLE 5
COUNTER FACTUAL SIMULATION OF THE INCREASE IN FDI IF THE COUNTRY ADOPTED THE
U.S. INDUSTRIAL RELATIONS SYSTEM

Country	Summated rating	% Change in FDI
Australia	18	12.5
Austria	19	13.5
Belgium-Luxembourg	19	13.5
Canada	9	3.1
Denmark	18	12.5
France	16	10.4
Germany	19	13.5
Greece	17	11.4
Italy	16	10.4
Japan	10	4.2
Netherlands	19	13.5
New Zealand	14	8.3
Norway	20	14.6
Portugal	17	11.4
Spain	15	9.4
Sweden	18	12.5
Switzerland	15	9.4
United Kingdom	10	4.2
United States	6	–

NOTE: Estimates use the parameters from Table 3, and the increases in FDI are within the countries in our sample.

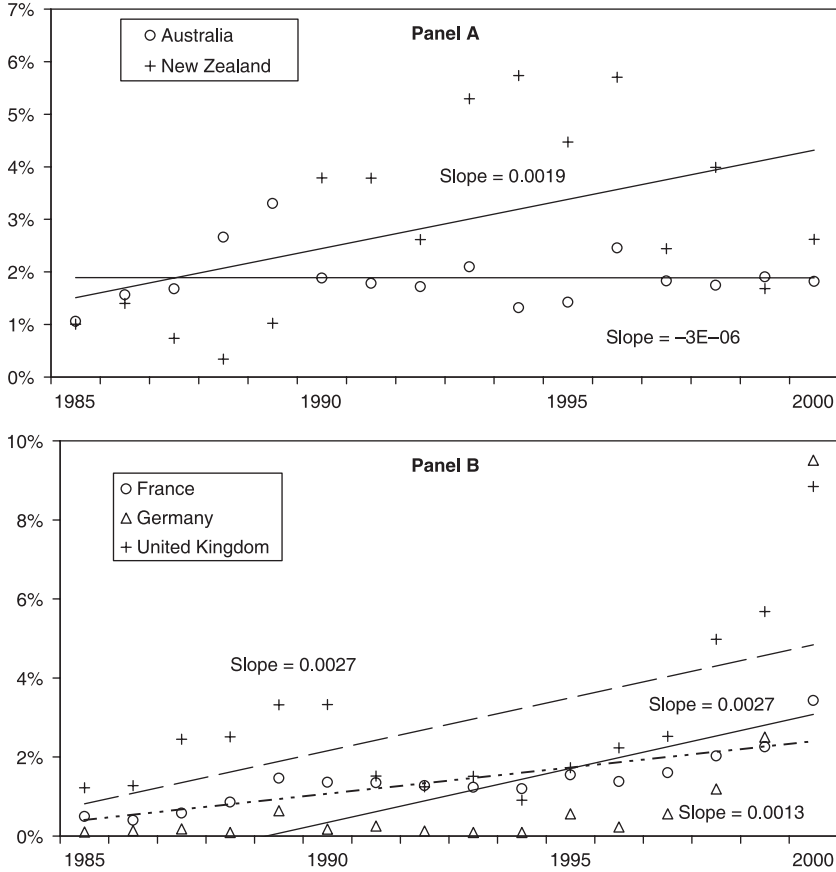
a U.S. industrial relations system range from a modest 3.1 percent increase for Canada to a more than 14.6 percent FDI growth for Norway. Overall, the estimates in Table 5 show modest impacts on FDI growth if the nations in our sample adopted industrial relations institutions similar to those in the United States.

Impacts of Large Changes in Industrial Relations

Two countries in our sample underwent particularly large changes in their industrial relations system. In Figure 3 we show how changes in industrial relations systems impact FDI by comparisons with similar nations in the same geographic region. The two nations in our sample of OECD countries whose institutions changed most dramatically were New Zealand and the United Kingdom. In both cases, each country reduced its regulatory structure following national elections in the early to mid-1980s. In panel A of Figure 3 we show the slope of the line for FDI relative to GDP for the 1985 through 2000 time period for New Zealand relative to Australia over time

FIGURE 3

COMPARISONS OF FDI TRENDS FOR NATIONS THAT SIGNIFICANTLY TRANSFORMED THEIR INDUSTRIAL RELATIONS SYSTEM WITH MODEST CHANGERS



(Bray and Walsh 1998). In New Zealand, the outcome of the change in labor relations laws and policy resulted in an acceleration of the move to individual employment contracts and a reduction in collective employment contracts (Wooden and Sloan 1998). The consequence of the passage of the Employment Contracts Act of 1991 in New Zealand reduced the role of unions in bargaining. Moreover, in the private sector, the result was a decline in union membership and union density, and the greater use of legal remedies in employment disputes and grievance resolution relative to wage setting through arbitration. This analysis presents a proxy for a potential “fixed effect” for New Zealand. In New Zealand, a transformation occurred in its

industrial relations and other labor and product market institutions starting in 1984, which accelerated in the early 1990s relative to Australia, a nation that did little to change its industrial relations institutions and maintained a high value for the industrial relations index during most of the period.

The estimate of the plot of the line shows that the two countries were at a similar level beginning in 1985, but that New Zealand's proportion of FDI grew more rapidly relative to Australia. As our model suggests, the estimate of the line shows a nonlinear relationship in the growth of FDI over time. In panel B we show a similar plot for the UK, which also significantly changed its industrial relations institutions in the 1980s to a lower level, and continued these transformations through 2000 (Card and Freeman 2002). The plot of the line for FDI relative to GDP is higher for the UK than for the similarly sized continental countries of Germany and France, which had much smaller changes in their industrial relations system but maintained them at high index value levels (Wallerstein, Golden, and Lange 1997; Kleiner 2005). In these two cross-country examples, changes in the industrial relations system were associated with increasing FDI in a manner consistent with our estimated results.

Beyond FDI activity, however, these industrial relations institutions seem to have been associated with narrowing levels of wage and income dispersion within countries (DiNardo, Fortin, and Lemieux 1996). Consequently, industrial relations institutions may reduce the ability of managers to allocate resources, but they benefit workers through greater voice and labor standards for all employees, and this may be worth the costs to a nation of having less foreign investment. However, as our theory section implies, countries may choose higher levels of industrial relations institutions, which they see as optimal from a social perspective, even though it may mean lower levels of FDI. Moreover, high levels of industrial relations institutions may result in larger FDI relative to intermediate ones, given the nonlinear form of the relationship and other nation-specific institutions.

Conclusions

This study has examined the influence of the industrial relations system on direct foreign investment between nations in the OECD. We develop and estimate an industrial relations systems index rather than using individual variables to examine the role of industrial relations on the amount of direct foreign investment in the destination nations. We estimate the model using data from nineteen OECD nations for the sixteen years 1985 through 2000.

Linear and quadratic form estimates from the reduced form model show that the effect of the industrial relations system variable is statistically significant and of moderate size on FDI. We find some evidence that there is a multiple equilibrium level of the industrial relations system with FDI. Furthermore, using comparisons of countries changing to less restrictive industrial relations systems, in the case of New Zealand and the UK, showed that FDI grew more rapidly in comparison to similar countries whose systems remained relatively restrictive and unchanged. However, the transactions cost of changing an industrial relations system are presumably high, although countries like New Zealand and the UK have achieved greater FDI than neighboring nations that did not greatly change their industrial relations system. In contrast to some previous analysis, our results suggest that multinational firms in more developed nations tend to be somewhat sensitive to the industrial relations climate, preferring ones that provide management with a greater amount of leeway in allocating labor and reducing employee voice at work. Of course, public policies must consider more than foreign investments by large firms in their choice of the kinds of industrial relations systems and social climate they wish to provide employees. Giving workers an environment where they have a greater say at the workplace with higher wages and benefits may be worth the reduction in foreign investment, which is the unintended consequence of these policies. However, policy makers and interest groups also need to be aware of the efficiency consequences of their constituents' equity concerns (Okun 1975; Freeman 2000). Further examination of more nations and time periods and additional changers to different systems, as well as using more microeconomic data and field interviews with executives and other employees may complement and supplement our insights into this issue.

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APPENDIX A

SUMMARY OF ECONOMIC AND INDUSTRIAL RELATIONS SYSTEM VARIABLES BY COUNTRY
(1985–2000)

Country	FDI outflow*	FDI inflow*	GDP*	SR	Rasch
Australia	229 (127)	4,256 (1,849)	309,717 (77,184)	18	0.62
Austria	48 (26)	1,939 (2,491)	170,510 (49,495)	19	0.85
Belgium-Luxembourg	647 (1095)	13,970 (20,000)	203,807 (56,911)	19	0.85
Canada	2459 (2492)	7,383 (6,332)	558,326 (99,540)	9	-1.4
Denmark	131 (132)	3,005 (4,093)	138,302 (36,426)	18	0.62
France	1583 (2176)	15,628 (11,761)	1,203,767 (296,473)	16	0.19
Germany	1440 (1366)	18,437 (43,325)	1,725,509 (545,569)	19	0.85
Greece	a	2 (1)	92,073 (28,610)	17	0.4
Italy	251 (126)	4,086 (3,759)	998,252 (237,600)	16	0.19
Japan	1808 (685)	5,699 (6,971)	3,678,995 (1,118,877)	10	-1.12
Netherlands	1023 (820)	11,291 (13,726)	312,716 (85,868)	19	0.85
New Zealand	69 (155)	1,349 (966)	46,443 (12,244)	14	-0.23
Norway	145 (122)	1,902 (1,705)	121,756 (30,552)	20	1.11
Portugal	21 (48)	1,455 (1,379)	81,249 (30,439)	17	0.4
Spain	275 (402)	9,473 (8,002)	477,499 (140,403)	15	-0.02
Sweden	298 (289)	6,949 (13,817)	211,861 (44,942)	18	0.62
Switzerland	832 (484)	3,536 (4,791)	224,888 (56,494)	15	-0.02
United Kingdom	2855 (3781)	30,753 (32,341)	1,028,383 (303,017)	10	-1.12
United States	2279 (1689)	82,789 (81,091)	6,704,120 (1,751,214)	6	-2.88

*In millions.

*Greece had little FDI outflows in our data.

APPENDIX B

RESPONSIVENESS OF THE FDI MODEL TO ALTERNATIVE SPECIFICATIONS. IMPACT OF
THE INDUSTRIAL RELATIONS SYSTEM ON FDI OUTFLOWS AS A PERCENTAGE OF GDP
(1985–2000)

		(1)	(2)
Without union coverage	Host country IR system (Summated rating)	-0.015** (0.002)	
	Host country IR system (Rasch)		-0.048** (0.006)
Without labor law restrictions	Host country IR system (summated rating)	-0.012** (0.002)	
	Host country IR system (Rasch)		-0.024** (0.003)
Without bargaining centralization	Host country IR system (summated rating)	-0.012** (0.002)	
	Host country IR system (Rasch)		-0.049** (0.007)
Without bargaining level	Host country IR system (summated rating)	-0.013** (0.002)	
	Host country IR system (Rasch)		-0.047** (0.007)
Without worker representation	Host country IR system (summated rating)	-0.012** (0.002)	
	Host country IR system (Rasch)		-0.044** (0.007)

NOTE: Standard errors are in parentheses. All results include all the variables used in Table 3.

**Significant at the 5% level.