

# Labor Market Regulation and MNE's Production: Evidence from OECD Countries

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## Abstract

**Purpose** – This paper examines the impact of labor market regulations on FDI and the production of foreign firms.

**Design/methodology** – We use an index of employment protection along with data on the FDI and production of foreign affiliates that are provided by the OECD.

**Findings** – The empirical results show that strict employment protection discourages both the production and initial entry of foreign firms, with its impact on production being larger than that on the initial entry decision. The result is robust to various specifications in which instrumental variable estimations are used by applying a unionization rate and a severance pay for redundancy dismissal as instruments, respectively. Therefore, policymakers should not limit their focus to tax incentives, cash grants, and relaxation of market regulations, but they should also extend their attention to labor market deregulation and decreasing non-wage cost to attract more foreign firms into their countries.

**Originality/value** – This paper attempts to answer the question on the impact of employment protection rules on the foreign firm's decisions regarding production as well as initial entry.

**Keywords:** Foreign Direct Investment, Labor Market Regulation, Multinational Enterprises

**JEL Classifications:** F22, F66, O29

## 1. Introduction

Many countries compete to attract Foreign Direct Investment (FDI) based on the belief that multinational enterprises (MNEs) foster economic growth, create jobs, and bring advanced technology to the countries in which they operate. FDI is also considered to be one of the most stable forms of foreign capital inflow, unlike capital flows in stock and bond markets. Several studies have investigated the factors affecting multinational's decision-making regarding the locations of their foreign affiliates. Among them, unit labor cost, availability of human capital, rule of law, and severity of corruption were deemed to be the most important factors. In addition to these, various incentives such as tax exemption and cash grants, along with product and labor market regulations, have also been identified as important determinants of FDI. While the former are long-term activities, the latter can be manipulated in a short period of time, so policy makers are more likely to focus on the latter when designing policies for FDI.

Since regulations can increase the entry, operation, and exit costs of an MNE's activities, they play important roles in the investment decisions of foreign firms. In particular, comparatively lax employment protection and higher flexibility of the labor market are closely associated with the exit cost of a foreign affiliate, and thus they are particularly important when MNEs expect high uncertainty regarding the future. Even assuming that a government provides generous investment incentives to lower entry cost, if foreign firms

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expect very high exit costs, such as those associated with rigid employment protection legislation, restrictions on lay-offs, or high redundancy payment, they will be less likely to invest in the country. According to an interview with the chief executive officer of GM Korea, Korea's labor costs<sup>1</sup> have recently surged, and the unique rules in Korean employment protection legislation force foreign firms to defer decisions on investment. Anecdotal cases also appear to support an important role of labor market flexibility on FDI. For example, Hoover, an American multinational firm, relocated its plant from Dijon, France to Cambuslang, Scotland in 1993, and a Hoover executive said that one of the reasons for the relocation was that its foreign affiliate has higher non-wage labor costs in France than Scotland (Olney, 2013). In addition, multinational firms tend to be footloose. More specifically, as the factor price of a destination country increases, as the demand of a host country changes, or as the domestic market competition becomes more intense, MNEs may have incentives to shut down their foreign plants in that country and relocate them to another country in order to better exploit opportunities. Therefore, MNEs are more likely to be sensitive to future costs that will be incurred when they close their plant and leave the host country.

A large number of papers have investigated determinant factors for the location decisions of multinational companies. For example, Devereux and Griffith (1998), Grubert and Mutti (2000) and Hines (1996) examine the impact of tax rate on the location decision of multinational firms, while Head et al. (1999) and Hubert and Pain (2002) study whether financial incentives affect the location choices of multinational firms. They find that lower tax rates and favorable financial incentives attract more FDI to the host country. In addition, Lee Jong-Won and Kawai (2006) study the impact of trade measures on the investment decision of Korean multinationals, and they present that the intensity of the EU's antidumping actions affect Korean investor's decision. Zhao and Lee Jong-Chul (2007) present that bilateral investment treaties significantly promote FDI from data on Chinese foreign-investing enterprises. However, foreign firms may care about exit cost as much as entry cost. In this regard, Benassy-Quere et al. (2007), Gorg (2005) and Javorcik and Spatareanu (2005) examine the impact of labor market regulations on FDI and find that foreign firms are more likely to invest in countries with higher labor market flexibility. They measure the strictness of the labor market with an index of hiring and firing practices obtained from the opinions of managers on labor market flexibility collected by the Global Competitiveness Report. On the other hand, Dewit et al. (2003) and Nicoletti et al. (2003) deal with the question of using an index of employment protection provided by OECD, and also find that strict employment protection deters inward FDI.

The association between more flexible labor market regulations and increased foreign investment is also theoretically supported by several papers. They observe that labor market conditions are closely associated with the potential exit cost which multinational firms will have to pay when leaving the host country. Dixit (1989)'s model explains that a higher exit cost or stricter labor market lowers the expected value of investment, and foreign firms are reluctant to invest in host countries with high exit costs. Haaland and Wooton (2002) also show that investment incentives and exit costs of severance payment are important for FDI by setting up a partial equilibrium model. The model indicates that strict employment protection discourages foreign firms from domestic production, particularly in industries with high risk of failure, and laxer employment protection brings about more benefits to both MNEs and the host country.

Considering that the main purpose of inward FDI policies is to foster economic growth and create jobs by MNEs, the question of whether labor market regulations affect MNE's

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<sup>1</sup> The labor cost includes both wage cost and non-wage cost, such as an obligation to transfer non-regular workers into regular workers, frequent labor negotiations, a specific wage structure, etc.

production decisions is also an important question. While tax exemptions and cash grants increase the likelihood of FDI, a favorable labor market may influence employment and production after a firm enters the host country. However, no paper has examined the impact of labor market rules on the production decisions of foreign firms. Contrary to the previous literature, this paper attempts to answer the question by examining the impact of employment protection rules on the foreign firm's decisions regarding production as well as initial entry. In order to deal with the question, I use OECD data on the activities of multinational firms. To my knowledge, data on the production and number of foreign affiliates obtained from a series of 'Measuring Globalisation' published by OECD have yet to be used in previous papers, and this paper is the first to use detailed data on the activities of multinational firms across OECD countries to study the association between labor market flexibility and MNE's decisions regarding entry, production, and expansion. The OECD data provides detailed data on the number of foreign establishment and production of foreign firms, along with an index of the strictness of employment protection for OECD countries. This allows us to examine the impact of labor market conditions on production and expansion as well as foreign investment by MNEs.

They are estimated by controlling for time and country fixed effects and various host country characteristics that affect foreign firm's activities. The results are consistent with those in previous papers indicating that strict labor market rules deter initial investment from foreign firms. Further, more importantly, the strict labor market legislation has a negative impact on the production and expansion of the foreign affiliates. In order to address endogeneity bias more carefully, an instrumental estimation is used by respectively applying a unionization rate and a severance payment as instrument variables. The results are robust by showing that more stringent employment protection rules negatively influence MNE's decisions regarding investment and production.

The remainder of the paper is constructed as follows. Chapter 2 discusses theoretical backgrounds to explain how labor market standards affect MNE's decision making on the location of foreign affiliates through exit costs. In chapter 3, empirical strategy, data, and primary descriptive statistics are discussed. The main results are presented in chapter 4, and finally chapter 5 contains concluding remarks.

## 2. Theoretical Backgrounds

Several papers provide a theoretical framework on how the labor market conditions of the host country affect multinational firms' decisions regarding their locations of operation. Gorg (2005) develops a theoretical framework based on Dixit (1989)'s work on investment under uncertainty. It considers greenfield investment and acquisitions as well as the expansion and reduction of investment by MNEs already operating in the host country. In this regard, Gorg (2005) is consistent with the purpose of this paper, which tests the impact of labor market flexibility on both the likelihood of FDI and the production and expansion of the existent firms. Dixit (1989)'s model assumes that the firm has the following options to choose from: invest in the host country, exit the host country, or maintain the status quo and wait for the next period. If the firm enters the host country, it faces variable cost ( $c$ ) for operation as well as price uncertainty ( $p$ ), which follows a certain stochastic process. If the firm decides to exit the host country, it has to pay an exit cost ( $k$ ) such as a severance payment. Therefore, the firm comprehends that under a higher exit cost or stricter labor market conditions, it is not easy to disinvest, even in an unfavorable market situation, compared to staying in the host country and paying variable costs. Therefore, it lowers the expected value of investment and makes the firm reluctant to invest in the host country with expensive exit costs. Haaland and

Wooton (2007) also show that the investment incentives and exit costs of severance pay play important roles for FDI by setting up a partial equilibrium model. The following briefly summarizes the model and discusses some of the interpretations and hypotheses to be tested in the next section.

First, the model assumes uncertainty in the future in the sense that firms may shut down their plants and put workers out of their jobs as rivals emerge or consumer demands change. The uncertainty is specified as a probability  $\rho$  of being hit by a negative shock and shutting down the company, and it is given exogenously. When the shock is realized, the firm closes down the plant and dismisses its workers. In addition, the domestic uncertainty is distinguished from the risk faced by MNEs because multinational firms are known to be more footloose than domestic firms (Gorg and Strobl, 2003). This can be summarized as  $\rho_D < \rho_M$ , where  $\rho_D$  and  $\rho_M$  indicate the probabilities of failure of domestic firms and foreign firms, respectively.

In order to guarantee stable employment for workers, governments can establish a number of countermeasures for dismissal, such as minimum levels of redundancy compensation or minimum periods for layoff notice. While these measures increase employment stability, they subject firms to costs to adjust the level of production or shut down the plant in an uncertain economy. The model assumes that employment protection can be captured by severance pay, described by the ratio of  $\sigma$  of the wage. Then, the exit cost for the clearing firm for each worker is  $\sigma w$ , and the total amount of exit cost charged on the closing firm is  $\sigma w N$ , where  $w$  indicates the level of wages in each period and  $N$  represents the number of workers hired by the firm. The ratio of severance payment stands for the level of the country's employment protection in the model. A higher ratio of severance payment in a country indicates a less flexible labor market.

The total cost of employing one worker includes both the current wage and the present value of expected severance payment, and it can be written as follows:

$$\omega = (1 + \delta\rho\sigma)w \quad (1)$$

where  $\omega$  is the total cost of employment of one worker and  $\delta$  is a discount factor which is less than 1.

Under the assumption that the wage is determined by a labor union at the national level in order to maximize the total earnings of workers subject to the aggregate labor demand, the maximization problem and an optimal level of the total cost of employment and wage can be given as follows:

$$U(\omega, N) = (\omega - v)N \quad \text{s. t. } N = \frac{a - \omega}{d} \quad (2)$$

$$\omega = \frac{a + v}{2} \quad (3)$$

$$w = \frac{a + v}{2(1 + \delta\rho\sigma)} \quad (4)$$

where  $v$  is the opportunity cost of employment of a worker while  $a$  and  $d$  are constants. The union considers the value of employment which depends on domestic labor market conditions such as factor endowments, unemployment rate, and skills of the domestic workers, specifically described as a value of the next-best alternative job ( $v$ ). From equation (4), we can infer that the wage level is negatively affected by the domestic probability of failure and the severance payment. That is, as the economic condition of a country is more unstable, or as the labor market rule is stricter, the wages received by employees will be lower.

Regarding the MNE's decision on employment and production, we assume that firms produce a variety of differentiated goods, that one unit of labor is required to produce one unit of good, and that the production accompanies a fixed cost  $F$  and a variable cost  $w$ . Then, the MNE's problem of maximizing the expected present value of net operating profits and the optimal level of production and employment can be summarized as follows:

$$\sum_{t=1}^{\infty} \delta^{t-1} (1-\rho)^t (px - wx - F) - \sum_{t=2}^{\infty} \delta^{t-1} (1-\rho)^{t-1} \rho \sigma wx$$

$$\text{s. t } C = F + wx$$

$$p = a - bx \quad (5)$$

$$x = L = \frac{a - (1 + \delta \rho \sigma)w}{2b} \quad (6)$$

where  $p$  and  $x$  indicate the price and output, respectively, and  $a$  and  $b$  are constants. Since we assume the normalization of the unit labor requirement to unity, the level of employment is the same as the level of production,  $L=x$ . Equation (6) indicates that employment and production decrease with severance cost. Additionally, since the probability of failure is greater for MNEs than domestic firms ( $\rho_M > \rho_D$ ), and the primary differential value of production with respect to the severance cost is  $-\frac{\delta \rho w}{2b}$ , one unit increase in severance payment has a larger negative impact on production for MNEs than domestic firms. In fact, it is possible that since foreign firms have several options to invest, they are more sensitive to the exit cost of the host country, and can easily move to the country which ensures the largest benefit. To summarize, domestic labor market conditions affect multinational firm's decisions regarding production in the host country. The model indicates that strict employment protection discourages foreign firms from domestic production and expanding their operations in an uncertain economy.

Based on this model, the next section discusses whether there is empirical support for the hypothesis that production and expansion by MNEs are negatively associated with the strict labor market legislation. While most of the previous papers have focused on the impact of the labor market regulations on the flow of foreign direct investment, this paper considers its impact on the production as well as entry decision of foreign firms.

### 3. Empirical Strategy and Data

#### 3.1. Empirical Strategy

The main question in this paper is whether labor market flexibility affects production by MNEs in the domestic market. However, before analyzing this, we first investigate the effect of labor market conditions on the FDI or entry decision of foreign firms in a cross-country regression framework, as has been done in most previous papers. In order to test this, the following equation is estimated:

$$FDI_{c,t} = \alpha_1 + \alpha_2 LM_{c,t-1} + \alpha_3 X_{c,t-1} + \mu_c + v_t + \epsilon_{c,t} \quad (7)$$

where  $FDI_{c,t}$  is the log of inward FDI stock in country  $c$  in year  $t$ ;  $LM_{c,t-1}$  is the log of the index of strictness of employment protection in country  $c$  in the previous year; and  $X_{c,t-1}$  is a vector of potential determinants of FDI location choice, which includes log of GDP, log of population, log of unit labor cost, log of corporate income tax rate, log of cost of starting a

business, log of openness, and log of an index of intellectual property rights at year  $t-1$ . These are included in order to alleviate concerns that changes in labor market flexibility could be inadvertently capturing other types of institutional or economic changes that are correlated with FDI. Specifically, GDP controls for market size or potential domestic demand for goods and services produced by the multinational firms, while population accounts for the average purchasing power of the host country. Further, the unit labor cost, corporate income tax rate, and cost of starting a business are controlled to better isolate the causal effect of the labor market rules on FDI, because they affect decisions on the production location of foreign firms. Openness measures the trade cost of the host country and the index of intellectual property rights captures the risk of expropriation of assets and insecurity of property rights and contracts. All of the independent variables are used as lagged variables to alleviate the problem of endogeneity. In addition, country and time fixed effects are considered to control for the unobserved country-specific and macro factors that can affect FDI. The last term is a mean-zero error term.

We then investigate whether labor market standards influence the activities of multinational firms. In order to test the hypotheses, this paper adopts the production and average size of the foreign firms as dependent variables, as opposed to the volume of investment by foreign firms, which has been used by previous studies. The equations are the same as the previous ones except for the dependent variables, as follows:

$$PD_{c,t} = \alpha_1 + \alpha_2 LM_{c,t-1} + \alpha_3 X_{c,t-1} + \mu_c + v_t + \epsilon_{c,t} \quad (8)$$

$$Avg.pd_{c,t} = \alpha_1 + \alpha_2 LM_{c,t-1} + \alpha_3 X_{c,t-1} + \mu_c + v_t + \epsilon_{c,t} \quad (9)$$

where  $PD_{c,t}$  is the production value of foreign firms in country  $c$  at year  $t$ , and  $Avg.pd_{c,t}$  is an average production of the foreign firms in country  $c$  at year  $t$ , which is constructed by a ratio of total production value by foreign firms to the number of foreign establishments. These capture the contribution of foreign firms to host country's production and economic growth. As flexible labor market legislation is associated with lower exit costs, we expect that a more flexible labor market will be correlated with larger production by foreign firms in the domestic market.

Although the baseline estimation includes time and country fixed effects as well as a number of host country characteristics and lags all the independent variables to identify a causal relationship between strictness of employment protection and MNE's decisions regarding investment and production, there may be endogeneity concerns. For example, a recession might act as a catalyst for structural reform by relaxing employment protection or market regulations. In addition, as foreign firms hesitate to invest in the country during a recession, MNE's investment and production would decrease during the recession. This can lead to a spurious positive bias in the baseline estimation. In addition, endogeneity can arise as foreign firms put pressure to attenuate employment protection legislation, causing a negative bias in the baseline estimation. On the other hand, if the domestic labor market responds to MNE's presence by strengthening employment protection rules to increase job security, it will lead to a positive bias in the baseline estimation. Therefore, in order to more carefully address the causal relationship between employment protection and multinational firm's activities, an instrumental variable approach is used by applying a unionization density as an instrument for employment protection. Countries with increasing unionization density may not need to establish strict labor market regulations.<sup>2</sup> The unionization density is

<sup>2</sup> Besley and Burgess (2004) and Olney (2013) also used unionization rate as an instrumental variable for employment protection.

calculated as the share of the total wage and salary earners that are union members. In addition, in order to evaluate the robustness of the IV results, severance pay for redundancy dismissal after 10 or 20 years of continuous employment is also used as an instrument for the index of strictness of employment protection. Strict employment protection might be reflected in the form of high severance pay. Lastly, in order to check whether changes in employment protection take time to affect a foreign firm's decisions, the baseline estimations are regressed with two-years, three-years, and five-years lagged variables of employment protection.

### 3.2. Data

The data on FDI, production value<sup>3</sup>, and number of foreign establishments were obtained from the OECD for the period from 1990 through 2012. The data on FDI come from OECD statistics while the remaining two variables are obtained from a series of 'Measuring Globalisation' published by OECD.<sup>4</sup> Despite limitation of only covering OECD countries, since OECD countries receive about 65 percent of the world inward FDI, it is sufficiently representative of foreign firm's decisions regarding production. In addition, the appealing aspect of OECD data is that they provide comprehensive information on the activities of multinational firms from a wide variety of respects,<sup>5</sup> such as the number of establishments, production value, and so on, whereas other data sources provide only total amount of investment.

Labor market flexibility is measured based on the index of the strictness of employment protection from OECD. It is a composite index of rules on firing individuals or groups of workers and hiring workers on fixed-term or temporary workers, ranging from 0 to 6, with 0 representing the most flexible employment protection rules and 6 representing the most rigid ones. The firing rules involve notification process, timing of dismissals, severance pay, and so on, while the hiring restrictions include the number and duration of fixed term contracts, dualism of regular and temporary workers, and so on, for a total of seventeen measures. Since it is based on effective legislative and policy changes, it is considered to be an objective index. Although there are some concerns as to whether the index reflects the restrictiveness of the labor market well, as long as the index is associated with the flexibility of the labor market, it will be an appropriate index for estimating the impact of labor market standards on a foreign firm's decision making regarding entry and production in the host country. Further, the instrumental variables of a unionization rate and severance pay for redundancy dismissal after 10 or 20 years of continuous employment are obtained from OECD and World Bank Doing Business, respectively. However, the data on severance pay for redundancy dismissal are unfortunately only publicly provided from 2006 and beyond, covering a much shorter sample period and thus resulting in a reduced number of observations. Table 1 shows the list of countries and simple average strictness of employment protection over the sample period. The table shows that the US has the most flexible labor market regime, followed in order by

<sup>3</sup> The production value presented in national currencies is converted to US dollars, referring to nominal effective foreign exchange rates data obtained from the Board of Governors of the Federal Reserve System and European Central Bank.

<sup>4</sup> In the case that there are two different values for the number of employees from two reports of 'Measuring Globalisation', I choose the number which is closer to that in the next period or the one from a recent report.

<sup>5</sup> 'Measuring Globalisation' provides data on the number of enterprises, number of employees, turnover, value added, compensation of employees, R&D expenditure, number of researchers, gross fixed capital formation, total trade, and intra-firm trade.

Canada and the UK. By contrast, some European countries such as the Czech Republic and Netherlands are characterized by strict labor market regulations.

**Table 1.** List of Countries and Strictness of Employment Protection

Country	SEP	Country	SEP
Australia	1.354	Japan	1.605
Austria	2.575	Korea	2.591
Belgium	1.887	Luxembourg	2.246
Canada	0.921	Mexico	2.188
Chile	2.627	Netherlands	2.891
Czech-Republic	3.209	New Zealand	1.400
Denmark	2.153	Norway	2.333
Estonia	2.120	Poland	2.230
Finland	2.308	Portugal	4.424
France	2.382	Slovak Republic	2.303
Germany	2.663	Slovenia	2.627
Greece	2.720	Spain	2.580
Hungary	1.987	Sweden	2.677
Iceland	1.730	Switzerland	1.595
Ireland	1.392	Turkey	2.358
Israel	2.036	United Kingdom	1.186
Italy	2.758	United States	0.257

**Source:** OECD Statistics (2018).

The data on GDP, population, unit labor cost, and corporate income tax rate are obtained from OECD, the cost of starting a business<sup>6</sup> and trade openness<sup>7</sup> come from the World Bank, and the index of intellectual property rights comes from the Global Competitiveness Report.<sup>8</sup> The corporate income tax rate is recorded from 2000 while the cost of starting a business is only available from 2003 and beyond. However, stated in Azemar and Desbores (2010), since regulations have been relatively stable and corporate tax rates have not changed much over the last two decades, it is assumed that the corporate tax rate for the period of 1990 through 1999 was the same as it was in 2000, and the cost of starting business did not change from 1990 to 2003. On the other hand, although the index of intellectual property rights is only available from 2006, since this changes from year to year unlike the above variables, it is only included when examining the robustness of the IV results.

These measures form an unbalanced panel data set. The summary statistics on the variables are presented in Table 2. Although the sample only covers OECD countries, it shows substantial variations in all of the variables. Fig. 1 plots the country averages of FDI and production of foreign affiliates against country averages of strictness of employment

<sup>6</sup> The cost of a starting business includes all official fees and fees for legal or professional services that are required by law or commonly used in practice. In addition, fees for purchasing and legalizing company books are included if required by law.

<sup>7</sup> The trade openness is defined as the ratio of trade to GDP.

<sup>8</sup> The index of intellectual property rights is collected by asking managers to rate on a scale from 1 to 7 with higher scores on well-protected property rights.



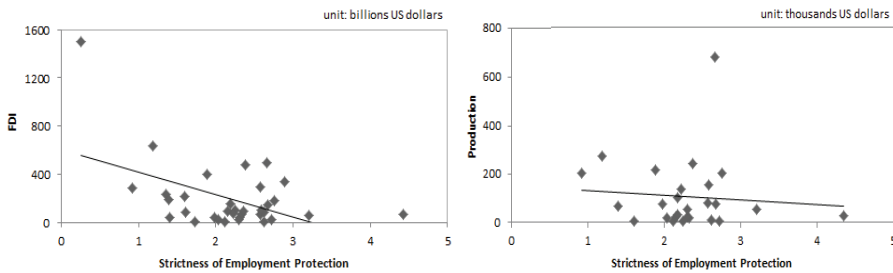
protection.<sup>9</sup> The trend lines, which present a sketchy relationship between employment protection and FDI and foreign production, show clear negative correlations between them, despite the fact that they have limits of not controlling for other factors which may affect both employment protection and MNE's decisions, thus not implying a causal relationship between them.

**Table 2.** Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	Observations
FDI	221,227	378,876	109	3,178,693	829
Production	368.39	1993.14	0.0037	12738.87	206
Average of production	2,374,858	12,500,000	4	74,900,000	198
Strictness of employment	2.13	0.75	0.26	4.58	697
GDP per capita	25,708	13,299	2,665	95,587	833
GDP	1,140,644	2,327,393	5,557	16,700,000	828
Unit labor cost	0.58	0.14	0.1	0.8	652
Corporate income tax	27.97	7.17	8.5	42.2	783
Cost of start business	9.68	10.37	0	41.2	841
Openness	75.06	48.08	0	351.71	984

**Note:** FDI, GDP, and Production are in millions of US\$.

**Fig. 1.** Strictness of Employment Protection and FDI

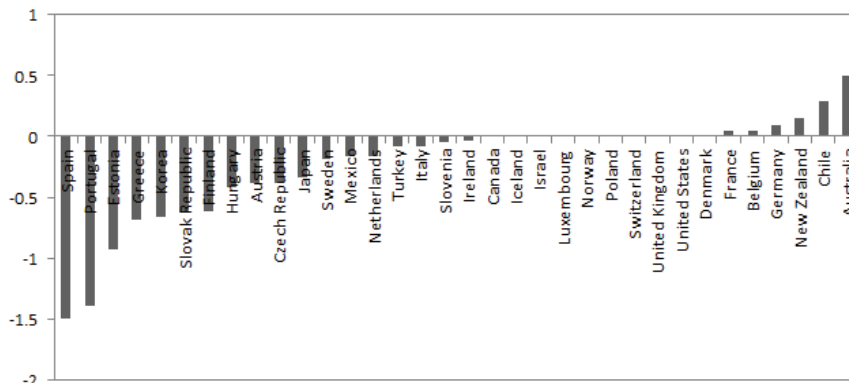


**Source:** Authors' calculation using OECD Statistics (2018).

Fig. 2 enumerates countries in order of the changes in the level of labor market regulations between 1990 and 2013 from the country which has experienced the highest increase in the flexibility of their labor market to the country which has instead actually raised the restrictiveness of the labor market. As shown in Fig. 2, most countries have relaxed or maintained the restrictiveness of their labor market. Specifically, Spain reduced their employment protection by 1.5 points, or 42 percent, while some countries such as Australia and Chile actually reinforced their employment protection. Spain has relaxed labor market rules by reducing requirements for dismissals, opening temporary work agencies, and reducing compensation for unfair dismissal (Olney, 2013). Finally, Fig. 3 shows trends of the strictness of employment protection and FDI over time. In the last 20 years, OECD countries have relaxed employment protection and FDI has continuously increased.

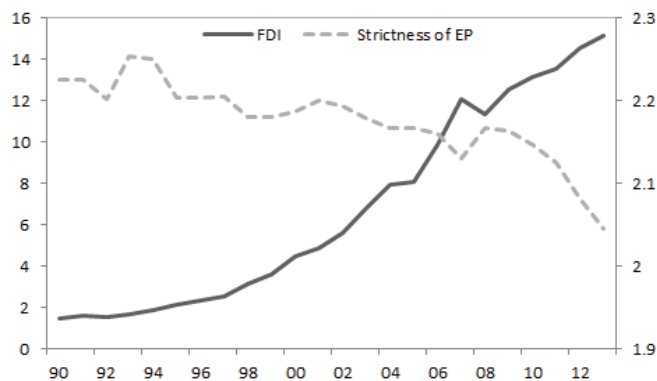
<sup>9</sup> Since the U.S. has very large FDI values, it is excluded from the figure and is located at the top left corner.

Fig. 2. Changes in Strictness of Employment Protection between 1990 and 2012



Source: Authors' calculation using OECD Statistics (2018).

Fig. 3. Strictness of Employment Protection and FDI



Source: Authors' calculation using OECD Statistics (2018).

### 4. Results

This section discusses the empirical results. First, the estimation results regarding the impact of employment protection on FDI are presented in Table 3. As higher indices of strictness of employment protection correspond to a more rigid labor market in the host country, we expect the estimated coefficient on FDI to be negative if a rigid labor market deters FDI. The results show that a flexible labor market attracts more FDI, more precisely, a one percent decrease in the strictness of employment protection raises FDI by 0.6 percent. This is consistent with previous studies indicating that more flexible labor market leads to decreases in the exit cost, and thus attracts more FDI to the host country. Further, the estimates of the GDP and population are positive and negative, respectively, and both of them are statistically significant, suggesting that FDI is attracted by larger and richer countries. The unit labor cost has a positive and significant coefficient. It is possible that a higher unit labor

cost is closely associated with higher human capital or that the variations in the unit labor cost are not sufficiently large among OECD countries. As expected, FDI increases with openness. The corporate income tax and the cost of starting a business are not found to be statistically significant.

**Table 3.** Strictness of Employment Protection and FDI

	FDI	Standard errors
Employment protection(t-1)	-0.612 ***	0.171
GDP(t-1)	1.083 ***	0.177
Population(t-1)	-3.761 ***	0.414
Unit labor cost(t-1)	0.339 ***	0.074
Corporate income tax(t-1)	-0.127	0.102
Cost of start business(t-1)	0.042	0.034
Openness(t-1)	0.331 ***	0.124
Constant	7.296 ***	2.687
Observations	537	
Adjusted R-squared	0.923	

**Notes:** 1. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

2. All variables but unit labor cost are in logarithms.

We now turn our attention to the impact of the strictness of employment protection on the production of multinational firms. Specifically, FDI in the previous regression shows a foreign firm's decision making regarding whether or not they will enter the host country, while production and average production variables reflect foreign firm's decisions on how much they produce and whether or not they will expand their operations after they enter the host country. Since the main purpose for a government to provide foreign firms with various incentives is economic growth and job creation, this question may be of particularly large interest to policy makers and international economists. The results are presented in Table 4. The coefficient on the strictness of employment protection in the case of the production is negative and statistically significant at the one percent level. The results indicate that strict employment protection deters the production as well as entry of foreign firms. Furthermore, the absolute magnitude of the main coefficient in the case of the production, 1.69, is larger than that in the previous regression with FDI as a dependent variable, implying that the strict employment protection rules have a more negative impact on the multinational firm's production decision than on the initial investment decision. The coefficient on the strictness of employment protection in the case of average production is negative but it is not statistically significant. All of the control variables appear to have the same signs as the previous case. In particular, the corporate income tax and cost of starting a business appear to be statistically significant. The corporate income tax has a negative impact on production, implying that a higher tax rate discourages foreign firms against domestic production. In addition, the cost of starting a business has a positive impact on the production of foreign firms. This seems to be counter-intuitive, but it is not inconsistent with the previous papers. Some papers (Azemar and Desbordes, 2010; Driffield, 2001) have argued that a high market entry cost decreases domestic competition and hence incumbent firms can enjoy high mark-ups. Since multinational firms are usually larger and more productive than domestic firms, they can overcome the entry barriers relatively easily and attain high mark-ups. Therefore,

they are more likely to be attracted to the host country with higher entry barriers or a more expensive cost of starting a business. Further, since a significant share of FDI in OECD countries is horizontal FDI to exploit local markets, the large economic rents may be an appealing factor for FDI. To summarize, the strict labor market conditions negatively influence the production of MNEs, and the size of the impact on a multinational firm's production is larger than that of the initial entry decision. Furthermore, comparing the coefficients of the strictness of employment protection and corporate income tax suggests that the labor market conditions make a greater contribution in terms of attracting FDI to the country than the tax incentives given to foreign firms.

**Table 4.** Strictness of Employment Protection and Production

	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-1.692 ***	0.365	-0.426	0.446
GDP(t-1)	1.207 ***	0.270	2.466 ***	0.326
Population(t-1)	-5.907 ***	0.972	0.320	1.222
Unit Labor Cost(t-1)	0.709 ***	0.221	-0.229	0.255
Corporate income tax(t-1)	-0.381 **	0.189	-0.108	0.214
Cost of start business(t-1)	0.088 *	0.049	0.044	0.057
Openness(t-1)	0.525 **	0.263	1.326 ***	0.305
Constant	10.93 ***	4.094	-32.51 ***	4.661
Observations	183		175	
Adjusted R-squared	0.868		0.746	

**Notes:** 1. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

2. All variables but unit labor cost are in logarithms.

In addition to the baseline results, panel A in table 5 reports the IV results using a unionization rate as an instrument variable for strictness of employment protection. The first stage IV results show that the unionization rate has a negative impact on the strictness of employment protection, as expected, and the F-stat of 18 implies that the instrument is statistically significant in explaining the strictness of employment protection. The coefficient on the strictness of employment protection is negative and statistically significant in the case of FDI and average production. The results presented in the table are consistent with the previous results in that stringent employment protection negatively influences MNE's decisions regarding investment and production. Specifically, a one percent increase in the employment protection leads to decreases in MNE's investment and average production by 0.18 and 0.71 percent, respectively, and this indicates that strict employment protection has a larger negative effect on the foreign affiliate's production than on their investment.

In order to further check the robustness, we adopt data on the severance payment for redundancy dismissal after 10 or 20 years of continuous employment as an instrument variable. As mentioned previously, data on severance payments are only available from 2006, leading to a significant reduction in the number of observations. Panel B in Table 5 shows IV results from estimating equations (7) through (9) by instrumenting the strictness of employment protection with a severance payment. The coefficients on the employment protection are negative and significant at the one percent level in the case of production and average production. These results confirm our previous findings that strict labor market discourages

foreign firm's production in the domestic market. Comparing the coefficients in the baseline with those in the IV estimation, the negative impact of the strict employment protection on the foreign affiliate's production is slightly smaller in the IV estimation than in the baseline results. This mitigates concerns that a recession might inadvertently affect both the investment and production decisions of MNEs as well as the strictness of employment protection, and the domestic labor market might respond to the presence of more foreign firms by strengthening employment protection rules.

**Table 5.** Strictness of Employment Protection and Production (IV)

Panel A. IV Results (unionization rate)

	FDI	Standard errors	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-0.176*	0.099	-0.040	0.159	-0.714***	0.151
Controls	Yes		Yes		Yes	
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	480		180		172	
Adjusted R-squared	0.823		0.762		0.504	

Panel B. IV Results (severance payment)

	FDI	Standard errors	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-1.468	-16.25	-1.639***	0.462	-1.650***	0.524
Controls	Yes		Yes		Yes	
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	176		95		95	
Adjusted R-squared	0.992		0.995		0.980	

**Note:** \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

MNEs might not be able to immediately adjust their investment and production in response to the changes in employment protection rules, or the impact of changes in labor market conditions on foreign firm's decisions might have a long-term effect. In order to provide additional insight into the relationship between employment protection and foreign investment and production, we estimate equations (7) through (9) with two-, three-, and five-years lagged indexes of strictness of employment protection, and they are summarized in panels A, B, and C of Table 6, respectively. The effect of strict employment protection on MNE's decision on investment and production becomes stronger and it is most likely to affect their decision in three years. However, its effect on FDI becomes weaker and its effect on foreign production is no longer statistically significant after five years. To summarize, the effect of employment protection on MNE's decision does not disappear immediately, rather they are likely to affect FDI and production over three to five years.

**Table 6.** Long-term Relationship between Strictness of Employment Protection and Production  
Panel A. Two-years lagged SEP

	FDI	Standard errors	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-0.796 ***	0.171	-1.343 ***	0.402	0.387	0.485
Controls	Yes		Yes		Yes	
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	176		95		95	
Adjusted R-squared	0.992		0.995		0.980	

Panel B. Three-years lagged SEP

	FDI	Standard errors	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-1.009 ***	0.178	-2.310 ***	0.477	-0.668	0.634
Controls	Yes		Yes		Yes	
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	514		181		173	
Adjusted R-squared	0.927		0.860		0.751	

Panel C. Five-years lagged SEP

	FDI	Standard errors	Production	Standard errors	Avg. Production	Standard errors
Employment protection(t-1)	-0.594 ***	0.176	-0.524	0.481	-0.112	0.452
Controls	Yes		Yes		Yes	
Country FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	441		154		148	
Adjusted R-squared	0.918		0.849		0.853	

Note: \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

Overall, under a variety of specifications, the results presented thus far are similar in that stringent labor market rules hinder foreign affiliate's operations as well as the initial entry of foreign firms. This is consistent with the previous literature showing the negative impact of employment protection legislation on FDI. However, most previous papers have been limited to showing the relationship between the labor market standards and FDI, while this paper shows that employment protection rules have a larger negative impact on production by foreign firms in the host country.

## 5. Conclusion

Among the factors taken into account by multinational firms when deciding on the location of the foreign affiliates, the labor market rule is one of the important factors. Specifically, it affects exit cost when the firm closes its plant or adjusts the level of production.

Although many papers have examined the impact of strict employment protection on FDI, no papers have investigated its impact on the foreign firm's decision regarding production. This paper attempts to test whether the labor market rules affect the production of foreign firms as well as FDI. Considering that many governments provide a variety of incentives to foreign firms in attempts to create jobs and boost economic growth, this certainly warrants attention because increased production means more investment and employment.

This paper begins by briefly summarizing theoretical backgrounds on how the labor market conditions of the host country affect multinational firm's location decisions (Haaland and Wooton, 2007), and empirically investigates the effect of strictness of employment protection on the multinational firm's decision on the FDI, production, and average production using fixed effect country panel model. In addition, instrumental variable approach is used to better understand the relationship between labor market standards and multinational firm's activities. Lastly, in order to check its long-term effect, various levels of lagged variables of employment protection are used. The empirical results support that strict employment protection discourages the initial entry of foreign firms, which is consistent with the findings of previous papers. In addition, it shows that restrictive labor market conditions deter foreign firm's production and additional expansion of foreign firms. More importantly, the magnitude of the impact is larger on determining the production of foreign firms than the initial investment decision. The results are also robust across a variety of different estimation strategies.

The results presented in this paper offer important policy implications - that providing various incentives such as tax exemptions and subsidies is not sufficient to attract more FDI and make foreign firms more likely to settle in the host country. The favorable labor market condition should also be considered in establishing FDI promotion strategies. However, current FDI promotion strategies are largely concentrated on tax incentives, cash grants, and relaxation of market regulations. Of course, while tax benefits or cash grants have advantages of low cost and do not accompany social controversy, considering the fact that labor market issues involve various interests of firms and employees and have a direct effect on the benefits of the firms and welfare of the workers, labor policies should be established to maintain balance between different interests.

Finally, we acknowledge a limitation of this paper that the data only includes OECD countries. Even though the results are expected to be similar for emerging economies, they can provide deeper understanding and insights on the role of labor market flexibility in attracting multinational firms into host country. Also, though the laxer employment protection might play more important roles in attracting vertical FDI than horizontal FDI and in labor-intensive industries than capital-intensive industries, we only take account of total FDI and production of multinational firms. It might be interesting to analyze whether the effect of labor market regulations on the multinational firm's decision differs according to their purpose of investment and main activities in the host country in the future research.

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