

Labor Legislation, Educated Labor & Foreign Direct Investment in Manufacturing in Taiwan

Yu-Cheng Lai & Santanu Sarkar

This study shows that educated labor is an important factor for output spill over and the sectors or firms in Taiwan with higher percentage of educated workforce have exerted a greater pull on foreign investment, whereas the local Taiwanese firms with higher percentage of educated workforce were unlikely to invest abroad. It was found that initially both foreign and domestic firms have reduced their investments when government introduced new legislations to regulate working conditions and employment practices in Taiwan. But when the government continued introducing more stringent labor standards, the country witnessed an upsurge in inflows of investment over a period of time and the domestic firms began investing abroad instead of concentrating in the home country.

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Introduction

Taiwan has witnessed a high economic growth post 1980s and this growth is largely attributed to its competitive labor quality and cost. At the same time, the foreign investments have played an important role in the country's economic development, especially with the inflow of foreign direct investment (FDI) from Japan, US and overseas Chinese. The country has had some amount of success in exerting a pull on FDI since the early 80's. But, after the enactment of Labor Standards Law (LSL) in 1984 and implementation of other stern measures by the Council of Labor Affairs (CLA) the comparative advantage of product price in Taiwan began to decline rapidly (Lai, 2010). As a result, Taiwanese firms started investing in the foreign markets in China and ASEAN countries (Lee & Wu, 1996) to maintain the product price competition.

As the global companies tried to keep its products competitive by investing around the world, the governments in host countries also tried out

different policies to attract FDI into their countries. According to Carstensen and Toubal (2004) the FDI inflow is largely due to the host country's high market potential and legal and economic environment, even if their relatively high labor cost may not always discourage the inflow of foreign investment. Unlike China and India, Taiwan does not have a large domestic product market. But, it has the other two advantages – legal and economic environment alongside the low unit labor cost. Cheap labor and competitive labor quality play a critical role in attracting foreign investors, and holding back the domestic firms from investing abroad. But then again, the enforcement of stricter labor standards can encourage the domestic firms to invest overseas (Lai & Sarkar, 2017a). Therefore, it would be important to study the effects of the Labor Standards Law (LSL) on labor cost, and to what extent were these effects responsible for bringing changes in inward and outward FDI in Taiwan. Simply put, has the lower labor quality and standards in the pre-LSL era helped the country in attracting more FDI or have the stricter labor standards enforced after mid 80s incidentally discouraged the FDI inflow to Taiwan?

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Trend of FDI & Labor Regulation Enforcement

The Labor Standards Law (LSL) in Taiwan was passed in 1984 soon after the foreign investment started rolling into the country. With the implementation of LSL, new enforcement procedures and personnel were introduced into the system. Even if, a small number of employers have followed the earlier laws, with the enactment of LSL, the situation changed considerably. In the post-enactment period, the country witnessed an upsurge in labor enforcement activities.

The political pressure that brought the LSL also prepared the ground for further reforms and subsequently the enforcement department – the Council of Labor Affairs (CLA) was set up in 1987. According to existing law, the CLA could inspect only those firms that employ more than 100 workers. The Council used to delegate its power to local authorities who were not always eager to enforce the LSL. Other problems included a handful of inspectors who were inadequately trained and an overlap with the jurisdiction of local inspection agencies. During this period, the local business also lobbied intensely against any significant penalty for defaulters. As a result, the CLA was unable to effectively conduct inspections under the LSL. Therefore, the enforcement department finally drafted the Labor Inspection Law (LIL) and implemented it in 1993.¹ Under the new

¹The LIL regulates all local inspection agencies that are now directly overseen by the central government's inspection system. This helps in avoiding effort duplication and conveys a clear

statute, the enforcement machinery was further strengthened and centralized. The years following the enactment of LIL (viz., from 1994 onwards) have been considered as the third phase in labor law reform in Taiwan that signifies stricter enforcement of labor standards in the country (Lai & Masters, 2005).

But then again, within three years from the enactment of LIL Taiwan, like other neighboring Asian countries, witnessed these verity of Asian financial crisis that impacted its domestic sectors as well as its global businesses to a considerable extent. It affected the foreign investment inflows and outflows in Taiwan too. Mitton (2002) and Lemmon and Lins (2003) have claimed that the impact of the financial crisis was felt mostly by the Asian firms or foreign owned firms operating in Asia between 1997 and 1998. On the domestic front, the Taiwan government initiated the unemployment insurance provision under Unemployment Benefits Rules (UBR) from January 1999 to strengthen employment protection clause which the LSL did not provide.² However, under this scheme, other than merely arranging for some payments to guarantee the basic livelihoods of employees who lost their jobs, the UBR had no provision of the employment service, rehabilitation or training. Therefore, to rec-

message to employers about the need for LSL compliance; consequently, it reduces the effectiveness of lobbying against enforcement.

² Government of Taiwan started providing unemployment insurance with the implementation of the Unemployment Benefits Rules (UBR) in 1999, adding the new provision for unemployment payment under labor insurance.

tify this lapse and in order to provide a more comprehensive employment protection, the government brought in a new legislation, the Employment Insurance Act (EIA) in January 2003.

From the above discussion we can say that there were five major reforms in labor legislations brought by the government in a span of twenty years towards consolidating the labor enforcement machinery. At the same time, the key changes in foreign investment inflows and outflows in every part of the world including Taiwan happened during these two decades. Therefore, it is pertinent to examine whether the reforms and its effects on labor standards account for any major changes in the inflow and outflow of investment in Taiwan during this period.

Literature Review

There is a strong division among those who studied the relationship between labor cost and foreign investment. On the one hand are those who point out a positive correlation between growing labor cost and plummeting inflow of foreign investment (Lai & Sarkar, 2011; 2017b). Some of them have drawn our attention to a positive relationship between the wage and outflow of foreign investment (Hatziu, 2000; Janicki & Wunnava, 2004; Feenstra & Hanson, 2001). On the other side are those who see a budding relationship between host country's market potential, legal, economic environment, labor quality and inflow of foreign investment thereby discarding other factors like labor cost as a

potential threat to its investment climate (Carstensen & Toubal, 2004; Gao, 2005 for China). Hanushek and Kimko (2000) found that labor quality characterized by the human capital accumulation leads to higher economic growth in host country. It was also seen that quality of manpower helps in rapid and effective transfer of technology from foreign lands to host country. Through productivity spillover the foreign ownership has positively influenced the output of domestic firms in host country (Sarkar & Lai, 2009). In this regard, Rhee and Belot (1990) argued that the foreign multinationals act as a natural channel for knowledge of the overseas market to the domestic firms, and by this means it encourages the export activity in host country. Labor quality has been found to be one of the important advantages of the host country that helped it in attracting foreign investment from developed world (Gao, 2005; Noorbakhsh, Paloni & Youssef, 2001). In the context of China, Gao found that education level of Chinese workers has played an important role in attracting foreign investment to the country. Compared to sectors with junior secondary and primary level educated workers, the ones with college and senior secondary level educated workers have exerted greater pull on investments from developed world. He has not observed a similar

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trend in the case of foreign investment inflows from developing countries, however.

So, there are two aspects to the effects of labor standards on foreign investment: one, the labor standards in host country compared to that in home country and two, the extent of employment protection in the host country. Concerning the first, we have noticed that comparison between labor standards in host and home countries explains the effects of labor standards on foreign investment. For example, studies have shown that investment rolls from home country to host country since there is greater flexibility in host country's labor market in absolute and relative terms compared to that of the home country (Javorcik & Spatareanu, 2005; Kucera, 2002). Nevertheless, the appropriate (local government) regulations in host countries do help them in attracting more foreign investment (Busse & Groizard, 2006). At the same time, it was also seen that excessive regulations have restricted the growth created by FDI, particularly when labor and capital resources were prevented from reallocating by the over interference of the statute. But, in case of Taiwan, the country's labor laws on hiring and employment protection have caused a much lesser harm, if any, to its business than what we have seen in US and Japan (IMD Survey, 1989-2006). For example, the LSL in Taiwan requires an employer to provide severance pay, but does not demand for two weeks' notice for termination of employment contract and in that way the provisions are still lesser stringent than those in countries

like US and Japan where the laws put up mandatory conditions precedent of termination besides other stipulations.

However, it has also been found that the employment protection law (particularly the requirement of severance pay) in Taiwan has caused an increase in wage liability for employers (Lin, 2009), which might account for slow growth of foreign investment. Besides, the high level of employment protection differential between host and home country was found to have caused a dent in the inflow and outflow of investment between the countries (Dewit, Görg & Montagna, 2009). Stringency of employment protections in domestic sectors tend to discourage outward FDI and at the same time the employers are not free to lay off the unproductive employees under stringent legal conditions, which indirectly cause harm to the country's overall investment climate (Dollar, Iarossi & Mengitsae, 2002). Coming back to the context of Taiwan, Lee and Wu (1996) found that the LSL has lifted up the labor cost and worsened the labor-management relationship thereby compelling the domestic companies to move their investment over-

seas. So, the law which was meant to protect employment rights, guarantee retirement or severance payment, maternity benefits and working hours restrictions led to an increase in the overall labor cost thereby reducing the demand for labor in Taiwan (Lai, 2019; Lai & Sarkar, 2017a; 2016; 2013; Lai & Master, 2005).

Data

We used both industry level as well as micro-level data. We have included data on inflow and outflow of FDI at the industry level and labor productivity for each industry sector. The data on inflow of FDI was taken from the annual statistics on 'approved overseas Chinese and foreign investment'. Data on outflow of FDI was taken from annual statistics on 'approved outward investment by industries' published by Ministry of Economic Affairs (MEA), Government of Taiwan. The number of employees working in each industry was taken from the annual statistics presented in the yearbook of earnings published by Directorate-General of Budget Accounting and Statistics, Executive Yuan (EY), Taiwan.

For the micro-level data, we used the Manpower Utilization Survey as the source for our primary data. We used the data from manufacturing industry across time periods within demographic groups. The sample was restricted to private firms in the manufacturing industry only and we included employees in the age group of 20–60 years. We excluded the self-employed, employers and the employees

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from public sector.³ We have restricted the sample to the manufacturing industry, because the major importers and exporters in Taiwan are from manufacturing sector. Also, more advanced data are available from the manufacturing rather than

other industries. The sample size for testing our model was restricted to the period starting from 1980 till 2006, and it comprised 181,502 employees for inward foreign investment and 157,282 employees for outward investment.

Table 1 The Sample Statistics

Variable	Means	Standards Deviation
Dependent Variables		
FDI _{it} : The log value of FDI Inflow per employee in a particular industry.	4.7068	1.5495
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Wage _{it} : The log value of monthly wage per employee.	9.2037	0.5386
Independent Variables		
Gender _{it} = '1': Male = '0': Female	0.5234	0.4995
Age _{it} : The employee's age	34.7846	10.8337
Marital _{it} = '1': Married = '0': Single	0.5933	0.4912
Ten _{it} : The employee's tenure	3.7866	5.3154
Primary _{it} : Primary education level	0.0408	0.1977
Secondary _{it} : Secondary education level	0.5142	0.4998
College _{it} : College education level	0.1925	0.3942
GRS _{it} : Graduate school education level	0.0107	0.1029
LSL: The years 1985-1997	0.8879	0.3155
CLA: The years 1988-1993	0.2062	0.4046
LIL: The years 1994-1997	0.2355	0.4243
AFC: Asian financial crisis, the year 1998	0.0605	0.2385
UBR: The years 1999-2002	0.2467	0.4311
EIA: The years 2003-2006	0.0566	0.2311
Industry Dummy Variables		
Ind1 _{it} : Food, Textile, Wears, Leather, Lumber, Paper	0.3596	0.4799
Ind2 _{it} : Chemical, Petroleum, Rubber and Plastics, Non-metallic	0.1189	0.3236
Ind3 _{it} : Metal	0.053	0.2241
Ind4 _{it} : Machinery & Transportation equipment	0.0436	0.2043
Ind5 _{it} : Electronics	0.0911	0.2878
Ind6 _{it} : Precision Miscellaneous	0.026	0.1591
Size1 _{it} : Employee number <100	0.3053	0.4605
Size2 _{it} : Employee number 100-200	0.088	0.2833
Size3 _{it} : Employee number >200	0.0705	0.2560

³ Farm labor will be less affected by the LSL than labor in other sectors. Besides, self-employed workers have flexible working hours. Further, public sector workers have been excluded from this study because the government is not subject to the same economic pressures as private sector firms.

Definitions of the variables and the descriptive statistics of our data are presented in Table 1. In order to measure the effects of labor regulations (LSL) on inward and outward foreign investment

with in a given industry sector, we used the data representing the changes in wages in the given industry. We first measured the effects of LSL on wages in manufacturing sector in Taiwan. Since the labor standards (viz., the LSL) are likely to affect the bargaining power (labor conditions) of employees and employers we used the wage variable as proxy for bargaining power.⁴ Then, we studied the extent to which these changes were responsible for causing variations in inward and outward investments.

We adopted the log value of real wage of employee i at time t using 1978 as the base year and used the log variable of deflated FDI in the industry level j at time t . Inflows and outflows of foreign investment in US dollar was calculated by dividing the real investment by the number of employees in an industry.

The demographic variables for HC_{it} include age (age_{it}), gender ($gender_{it}$), and marital status ($marital_{it}$) of employees. The main indicators were labor quality, for which we used the education level Edu_{it} as proxy variable (see Gao, 2005) that includes the Primary primary ($primary_{it}$), Secondary ($secondary_{it}$),⁵

⁴ Wage is considered as one of the common indicators of labor condition at individual employee level because higher bargaining power (or better labor conditions) will help in increasing the wages of employees (Vijaya & Kaltani, 2007). So, we hypothesized (in our model) that stricter labor standards will decrease the bargaining power of employers and as a result are going to result in rise in the labor cost.

⁵ In Taiwan the secondary-level education is bifurcated into junior and senior secondary-level education. However, there is no significant

College ($college_{it}$), and graduate school (GRS_{it}) levels.⁶

We used the variables of $Time_{it}$ to measure the cumulative effects of labor law enforcement in Taiwan (Lai & Masters, 2005) and these are: the effects of the LSL, the CLA and the LIL. The annual Manpower Utilization Survey is conducted every year in the month of May and the LSL, CLA and LIL were enacted in July 1984, August 1987 and August 1993, respectively. So, in order to measure the effects we adopted the followings: in our equation, the LSL variable used the years between 1985 and 1987 as dummy variable since the Labor Standards Law was enacted in July 1984. Likewise, the CLA variable set the years between 1988 and 1993 as dummy variable as the Council of Labor Affairs was formed in August 1987 and the LIL variable treated the years between 1994 and 1997 as dummy variable since the Labor Inspection Law (LIL) was implemented in August 1993 in Taiwan.

Furthermore, by using the variables of $Time_{it}$ we were able to test the cumulative effects by controlling the time period of Asian financial crisis (AFC) of 1997. Since the Manpower Utilization Survey was conducted in May 1997, therefore we have treated the year 1998 as the dummy variable for the financial crisis in Asia. Both UBR (Unemployment

difference between these two variables. Therefore, in this study we have adopted only one variable for secondary-level education.

⁶ Gao (2005) used the percentage of primary, secondary and college-level education as the proxy of labor quality.

Benefits Rules) and EIA were able to measure further effects of employment protection. The UBR was implemented in January 1999, and Employment Insurance Act (EIA) was enacted in January 2003. So, we have treated the years 1999-2002 as the dummy variable for UBR and 2003-2006 as the dummy variable for EIA in our model.

The time or Td_i variable that range from 1 to 26 in order to represent each year from 1980 through 2006 was able to measure the trend effect, which, in turn captured the effects of macroeconomic conditions over a fairly long period of time in Taiwan.

Since the sample comprises industry level data, we have controlled the industry and firm size in our model to obtain a greater explanatory power. Based on the classification of industries, the industry dummy variables were used to divide the manufacturing sector into six major industries. The firm size dummy variables included $Size1_{jt}$ for the firms with less than 100 employees, $Size2_{jt}$ for the firms with employee strength between 100 and 200, and $Size3_{jt}$ for the firms with more than 200 people on roll.

Estimating the Effects of FDI Inflow & Outflow

In order to deal with the sample selection bias, we adopted the Heckman two-stage method. Because wages were recorded only for those observations which were working, in the first step we derived an estimated wage for all observations based on a wage equation that

controlled for sample selection due to the employment of labor. The wage equation is specified as follows:

$$Wage_{it} = \gamma X_{it} + \sigma \lambda_i + u_i \dots \dots (1)$$

Here, X_{it} is a vector of individual characteristics believed to affect the offered wage and γ is the corresponding vector of coefficients; λ_i is the sample selection term, σ is coefficient of, λ_i and u_i is the error term. The wage equation is estimated for the subsample of working employees, and it included X_{it} as an explanatory variable. The sample selection (λ_i) was derived from a reduced-form estimation of labor force employment for all observations in the manufacturing and non-participating establishments.⁷ The estimation of the wage equation (viz., equation 2) was confounded by the inclusion of labor force employment as an endogenous explanatory variable.⁸ So, to obtain consistent estimates we used a two-stage procedure that accounts for the structure of the model, despite the limited nature of the dependent variables. Based on the results of the labor force participation model discussed above, the predicted probability of each person participating in the labor force was calculated and

⁷ Lee (1983) described the computation of a sample selection correction lambda term (λ_i) to be included as a regressor in the wage equation to account for selection bias of this form where λ_i is given by the second term on the right hand side of our equation (1).

⁸ The reduced form omits wage and includes, in addition to the explanatory variables in the labor force equation, age, education, and other variables related to the labor participation.

this was then used as an explanatory variable in the wage equation (equation 2). This estimation method did not assume a sequence to the decision making, even though the estimation was performed in stages.

$$Wage_{it} = a_0 + a_1 FDI_{jt} + \sum_{i=1}^{n=3} b_i HC_{it} + \sum_{i=1}^{n=4} c_i Edu_{it} + \sum_{i=1}^{n=6} d_i Time_{it} + eTdt + \sum_{i=1}^6 f_i FDI \times Time_{it} + \sum_{i=1}^{n=6} g_i Ind(I)_{jt} + \sum_{i=1}^{n=3} g_i Size(I)_{jt} + \delta\lambda + u_i \dots (2)$$

$$FDI_{jt} = a_0 + \sum_{i=1}^{n=3} b_i HC_{it} + \sum_{i=1}^{n=4} c_i Edu_{it} + \sum_{i=1}^{n=6} d_i Time_{it} + eTdt + \sum_{i=1}^{n=6} g_i Ind(I)_{jt} + \sum_{i=1}^{n=3} g_i Size(I)_{jt} + u_i \dots (3)$$

We used the real wage ($Wage_{it}$) as our dependent variable in equation 1 and 2. Our dependent variable in equation 3, viz., the FDI_{jt} was used to measure the effect of FDI inflows and outflows. Based on previous studies (Busse & Groizard, 2006; Neumayer & Soysa, 2005; Javorcik & Spatareanu, 2005; Kucera, 2002) and our proposed model, we used labor standards ($Time_{it}$) as independent variable in equation 2 and 3. It was able to measure the effects of labor regulation on wage, inflows and outflows of FDI. For measuring the labor quality we used the variable of education (Edu_{it}) as proxy. Other variables included in our model were demographic characteristic (HC_{it}) and time trend (Td_t) to control the personal characteristics of employees and year trend (equation 2 and 3).

In addition to the independent variables from equation 2, the variables of FDI and the interactions of FDI_{jt} with variables measuring each period of enforcement of labor ($FDI_{jt} \times LSL$,

$FDI_{jt} \times CLA$, $FDI_{jt} \times LIL$, $FDI_{jt} \times AFC$, $FDI_{jt} \times UBR$, and $FDI_{jt} \times EIA$) were added in equation 2. The interaction of FDI_{jt} with the enforcement of labor standards is expected to determine whether the foreign firms have paid higher wages after the enforcement of stricter labor standards and employment protection laws in Taiwan.

To adjust the problem of multicollinearity in our models, we followed three steps (Kutner, Nachtsheim, Neter & Li, 2005). First, we tested the variance influence factors (VIF) for each variable in the model. Then, we dropped variables with high VIF in our modified equation. Finally, we tested the VIF of each explanatory variable in the modified equation and dropped out the variables with VIF value greater than 10. Using the VIF results from the OLS method (columns [2] & [5] in Tables 2&3), in the results of WLS method we have excluded the variables with $VIF > 10$ to adjust multicollinearity.⁹ And we believe that the multicollinearity did not exist in our results since the value of VIF for each variable was smaller than 10 (values in parentheses of columns (2) & (5) in Tables 2&3). In order to adjust for heteroskedasticity, the method was estimated by using weighted least squares (WLS) procedure.

⁹ After adjusting the multicollinearity, the WLS wage results will not show the variables of CLA, LIL, AFC, UBR and EIA, and their interaction ($FDI \times CLA$, $FDI \times LIL$, $FDI \times AFC$, $FDI \times UBR$ and $FDI \times EIA$) (columns [3] and [6] of Table 2). The WLS fdi results will not show the variables of LIL, UBR and EIA (column [3] and [6] of Table 3).

Table 2 The Effects on Wages

	Inflow Investment			Outward Investment		
	OLS		WLS	OLS		WLS
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (Std. Dev.)	VIF	Coef. (Std. Dev.)	Coef. (Std. Dev.)	VIF	Coef. (Std. Dev.)
Intercept (a_{it})	7.8233 (0.0088)***	0 (0)	8.7160 (0.1768)***	2.0596 (0.0010)***	0 (0)	8.5225 (0.1851)***
FDI _{jt}	-0.0076 (0.0013)***	6.3732 (1.7638)	0.0334 (0.0007)***	-0.0019 (0.0010)*	21.0121 (1.7522)	0.0154 (0.0004)***
Primary _{it}	-0.2000 (0.0050)***	1.1442 (1.1345)	-0.2270 (0.0245)***	-0.0217 (0.0007)***	1.1327 (1.1256)	-0.2344 (0.0259)***
Secondary _{it}	0.1347 (0.0022)***	1.9263 (1.7886)	0.2595 (0.0026)***	0.0156 (0.0029)***	1.9689 (1.8406)	0.2435 (0.0027)***
College _{it}	0.3578 (0.0030)***	1.9179 (1.7522)	0.5780 (0.0198)***	0.0389 (0.0004)***	1.8797 (1.7288)	0.5278 (0.0207)***
GRS _{it}	0.6690 (0.0087)***	1.1127 (1.0850)	0.9953 (0.0378)***	0.0701 (0.0013)***	1.0734 (1.0533)	0.9328 (0.0395)***
LSL	0.0232 (0.0089)***	13.4744 (9.9997)	0.0437 (0.0083)***	0.0056 (0.0008)***	5.6314 (1.8050)	-0.1649 (0.0051)***
CLA	0.1703 (0.0104)***	29.0784		0.0145 (0.0011)***	21.5497	
LIL	0.2065 (0.0121)***	29.3710		0.0268 (0.0017)***	40.7125	
AFC	0.1126 (0.0197)***	23.8263		0.0149 (0.0023)***	25.4568	
UBR	0.0410 (0.0138)**	40.7134		0.0096 (0.0017)***	39.8549	
EIA	-0.1630 (0.0158)***	53.0563		-0.0087 (0.0020)***	50.7804	
FDI _{jt} ×LSL	0.0057 (0.0014)***	13.8073 (9.9347)	-0.0507 (0.0017)***	0.0015 (0.0007)**	5.8942 (1.6308)	-0.0322 (0.0018)***
FDI _{jt} ×CLA	0.0044 (0.0019)**	24.7499		0.0072 (0.0008)***	24.9889	
FDI _{jt} ×LIL	0.0025 (0.0020)	20.8689		0.0003 (0.0009)	30.0520	
FDI _{jt} ×AFC	0.0106 (0.0034)***	19.2185		0.0045 (0.0013)***	19.8828	
FDI _{jt} ×UBR	0.0041 (0.0017)**	17.1481		0.0004 (0.0007)	14.8853	
FDI _{jt} ×EIA	0.0107 (0.0018)***	19.9972		-0.0014 (0.0007)*	14.8894	
λ_i			-1.3170 (0.4870)***			-0.5925 (0.5098)
Adj. R square	0.6117		0.5072	0.5741		0.4995

Number of observations	163,731	163,731	186,445	186,445
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a. Based on Equation 2. (Dependent Variable = Log of monthly wage bBased on 1978 dollar. * p < .01 ** p < .005 *** p < .001

b. The industry and firm size dummy variables are included in the regressions. All standard errors are shown in parentheses.

c. The parentheses of columns 2 and 5 are new VIF after drop out some variables.

d. The columns 3 and 6 are modified by the multicollinearity.

Table 3 The Effects on FDI

	Inflow Investment			Outward Investment		
	OLS		WLS	OLS		WLS
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (Std. Dev.)	VIF	Coef. (Std. Dev.)	Coef. (Std. Dev.)	VIF	Coef. (Std. Dev.)
Intercept (a _{it})	3.4980 (0.0231)***	0 (0)	4.3577 (0.0168)***	2.9025 (0.0485)***	0 (0)	4.1634 (0.0316)***
Primary _{it}	0.0420 (0.0172)**	1.1425 (1.1423)	-0.1060 (0.0155)***	-0.2814 (0.0364)***	1.1324 (1.1322)	-0.3314 (0.0306)***
Secondary _{it}	0.0316 (0.0076)***	1.9242 (1.9233)	0.1665 (0.0068)***	0.3363 (0.0156)***	2.0234 (2.0225)	0.4754 (0.0129)***
College _{it}	0.2596 (0.0102)***	1.9108 (1.9107)	0.4320 (0.0088)***	0.0995 (0.0205)***	2.0356 (2.0356)	0.5068 (0.0178)***
GRS _{it}	0.5290 (0.0300)***	1.1065 (1.1062)	0.7264 (0.0239)***	-0.9572 (0.0564)***	1.1225 (1.1223)	-0.1006 (0.0675)***
LSL	0.3780 (0.0134)***	2.5955 (1.2856)	-0.1402 (0.0070)***	0.1027 (0.0308)***	3.0742 (1.4559)	-1.9909 (0.0154)***
CLA	0.8828 (0.0195)***	8.6312 (1.2013)	0.1689 (0.0064)***	1.6765 (0.0419)***	10.6973 (1.3792)	0.1842 (0.0118)***
LIL	0.7289 (0.0303)***	15.595		1.9786 (0.0626)***	18.2864	0.7492 (0.0158)***
AFC	0.8297 (0.0372)***	67.2154 (1.0285)	0.3472 (0.0141)***	2.0919 (0.0759)***	8.4596 (1.0280)	
UBR	0.4685 (0.0406)***	29.9213		0.4608 (0.0830)***	34.4193	0.3255
EIA	0.6056 (0.0490)***	43.4703		-0.2485 (0.0999)***	49.7271	
Adj. R square	0.4388		0.4623	0.2959		
Number of observations	163,731		163,731	141,553		141,553

a. Based on Equation 3. (Dependent Variable = Taiwanese business direct invest abroad per employees based on 1978 US dollar. * p < .01 ** p < .005 *** p < .001

b. The industry and firm size dummy variables are included in the regressions. All standard errors are shown in parentheses.

c. The parentheses of columns 2 and 5 are new VIF after drop out some variables.

d. The columns 3 and 6 are modified by the multicollinearity.

Empirical Results

It is pertinent to mention that wage was treated as a dependent variable in Table 2 and the inflow and outflow of foreign investment were treated as dependent variables in Table 3. The results of WLS reported in columns 3 and 6 in Table 3 show that the graduate-level education of employees has significantly and positively influenced the inflows of FDI, but at the same time has a negative influence on the outflows of investment from Taiwan to other countries. This indicates that higher educational attainment of employees in Taiwan could attract more foreign firms to invest in the country, whereas the domestic firms in Taiwan have largely remained conservative on investing abroad due to their ready access to a higher quality of (domestic) labor. In particular, the coefficients of graduate-level education were greater than coefficients of other education levels (columns 3 and 6 in table 2) and this points out that graduate-level has a larger effect on wages in comparison to other education levels in Taiwan. However, we found the lower education-level like primary or secondary also has significantly reduced the inflows of foreign investment as well as the outflows of investment from Taiwan (column 3 and 6 in

The graduate-level education of employees has significantly and positively influenced the inflows of FDI, but at the same time has a negative influence on the outflows of investment from Taiwan to other countries.

Table 3). Our WLS results indicated that there is a decline in wages earned by employees who were educated up to primary level (columns 3 and 6 in table 2). Whereas, the secondary and college/graduate-level education had positive effects on inward and outward investment (WLS results in column 3 and 6 in Table 3).¹⁰

After the implementation of laws like LSL, there was an increase in wage paid by employers in accordance with law, which to an extent, reduced their bargaining power.

Results of the WLS reported in column 3 and 6 in Table 2 reveal that enforcement of LSL had a positive effect on wages in case of inward foreign investment to Taiwan and negative effect on wages for outward investment from Taiwan to other countries. These results were for wage as a proxy for bargaining power. It suggests that after the implementation of laws like LSL, there was an increase in wage paid by employers in accordance with law, which to an extent, reduced their bargaining power. However, this phenomenon was more commonly observed in firms where foreign investment rolled in rather than those firms where employers have invested out in foreign countries. Needless

¹⁰ The relatively higher wage and lower productivity of workers with secondary-level education than those with primary-level education will eventually make the domestic Taiwanese firms to prefer workers with primary-level education over those with secondary-level education.

to say, for the employers of domestic firms who were investing abroad, the wages paid to their employees in foreign countries were comparatively lesser than what they otherwise used to pay in home country (Taiwan). As a result, we can say that reformed labor standards in Taiwan, to an extent, have increased the bargaining power of employers of domestic firms who were investing abroad.

However, we also noticed a marked difference between the changes brought in by the enactment of the LSL and those brought in by the establishment of the CLA. Our results presented in columns 3 and 6 in Table 3 show that both inflows as well as outflows of investment have significantly dropped after the enactment of LSL in 1984. The establishment of CLA brought back a positive impact on both inflows and outflows of investment. Besides, our results of the OLS and WLS for Asian financial crisis indicated that the crisis did have a positive effect on inflows of investment to Taiwan as well as outflows of investment by domestic firms in foreign countries.

Likewise, the results of WLS on the effects of FDI on wages, reported in columns 3 and 6 in Table 2, show that inward as well as outward investments have positive effects on wages. Results of the interaction of FDI with LSL reported in columns 3 and 6 in Table 2 show that the wages paid were affected by the regulations in both industries with rising inflows of foreign investment as well as in the ones with rising outflows of investment. In other words, the labor regulation (LSL) has decreased the

Bargaining power has declined as a result of strict labor legislation particularly in those industries where FDI has rolled in or rolled out.

wages in both industries with inflow of FDI as well as in those industries with outflow of investment. Therefore, we can say that the bargaining power has declined as a result of strict labor legislation particularly in those industries where FDI has rolled in or rolled out.

Discussion & Conclusion

One of the important findings of our study is regarding the role played by educational qualification of domestic labor in attracting foreign investment to the host country. We found that observance of higher education-level in employees (like graduate-level) has a significant positive effect on the inflows of foreign investment to Taiwan. Simply put, the sectors or firms in Taiwan with higher percentage of educated workforce have exerted a greater pull on foreign investors compared to those with relatively lesser qualified manpower. Our results indicated that there is a set of variables that clearly have a closer fit with the actual education level in Taiwan. As a result, it confirms that graduate-level education of employees can be treated as a valid measure of labor quality in studies of this nature. Nevertheless, our measure of labor quality, viz., the level of education of workforce does have a very different impact on the domestic industries: the local Taiwanese firms with higher per-

centage of educated workforce were unlikely to invest in foreign countries.

We further observed that the workforce with graduate-level education compared to lesser educated workers have played a crucial role in both inflows as well as outflows of FDI in Taiwan. Greater proportion of labor with higher educational qualification has resulted in better quality manpower. As a result, the foreign firms were more interested in investing in such county with greater proportion of qualified manpower like in Taiwan. However, the same was not applicable to the domestic firms in Taiwan for whom there were two different kinds of motivations regarding the quality of their manpower. On the one hand, some of them preferred more educated workforce since they believed that qualified workforce will bring in better quality human capital to the firms and as a result it will help the firms in saving their training cost. On the other hand, there were firms that preferred lesser educated workforce because being in a labor-intensive sector, they did not require much training and secondly for them the lower educated employees indirectly helped them in maintaining a lower wage structure across the departments within the firm.

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References

- Busse, M.&Groizard, J. L. (2006), "Foreign Direct Investment, Regulations and growth", World Bank Policy Research Working Paper, No. 3882
- Carstensen, K.&Toubal, F. (2004), "Foreign Direct Investment in Central and Eastern European Countries: A Dynamic Panel Analysis", *Journal of Comparative Economics*, 32(1): 3-22.
- Dewit, G., Görg, H. &Montagna, C. (2009), "Should I Stay or Should I Go? Foreign Direct Investment, Employment Protection and Domestic Anchorage", *Review of World Economics*, 145(1): 93-110.
- Dollar, D., Iarossi, G.&Mengitsae, T. (2002), "Investment Climate and Economic Performance: Some Firm Level Evidence from India", Center for Research on Economic Development and Policy Reform, Stanford University, Working Paper, (143).
- Feenstra, R. C.& Hanson, G. H. (2001), "Global Production Sharing and Raising Inequality: A Survey of Trade and Wages", *Working Paper 8372*, Cambridge, MA, NBER.
- Gao, T. (2005), "Labor Quality and the Location of Foreign Direct Investment: Evidence from China", *China Economic Review*, 16(3): 274-292.
- Hanushek, E.A.&Kimko, D. D. (2000), "Schooling, Labor-force Quality, and the Growth of Nations." *American Economic Review*, 90(5): 1184-1208.
- Hatzius, J. (2000), "Foreign Direct Investment and Factor Demand Elasticities", *European Economic Review*, 44(1): 117-43.
- IMD (1989-2006), *IMD WORLD COMPETITIVENESS YEARBOOK 1989-2006*, www.imd.ch
- Janicki, H. P.&Wunna, P. V. (2004), "Determinants of Foreign Direct Investment: Empirical Evidence from EU Accession Candidates", *Applied Economics*, 36(5): 505-09.

- Javorcik, B. S. & Spatareanu, M. (2005), "Do Foreign Investors Care about Labor Market Regulations? ", *Review of World Economics*, 141(3): 375-403.
- Kucera D., (2002), "Core Labor Standards and Foreign Direct Investment", *International Labor Review*, 141(2): 31-69.
- Kutner, M. H., Nachtsheim, C. J., Neter, J. & Li, W. (2005), *Applied Linear Statistical Models*. Ebook: <https://rvum4t7a3eh12.storage.googleapis.com/EgcaDnQgp8naWUIP7812.pdf>
- Lai, Y.C. & Masters, S. (2005), "The Effects of Maternity and Pregnancy Benefits on Women's Wages and Employment in Taiwan, 1984-1996", *Industrial and Labor Relation Review*, 58(2): 274-81.
- Lai, Y. C. (2010), "The Effect of Migrant Workers on Labor in the Manufacturing Industry in Taiwan", *Journal of International and Global Economic Studies*, 3(2): 39-52.
- Lai, Y. C. (2019), "The Effect of Migrant Workers on Native Workers — Evidence of College Premium from Taiwan ROC", *Global Economic Review*, 48(1): 88-110 (Doi: 10.1080/1226508X.2019.1571429).
- Lai, Y. C. & Sarkar, S. (2011), "Labor Cost and Foreign Direct Investment Evidence from India", *Indian Journal of Industrial Relations*, 46(3): 396-411.
- Lai, Y. C. & Sarkar, S. (2013), "Labor Market Effects of Work-Sharing Arrangements in Taiwan R O C", *International Journal of Manpower*, 34(6): 635-657.
- Lai, Y.C., and Sarkar, S. (2016), "Effects of Paid Parental Leave Allowance on Labor Market Outcomes in Taiwan", *International Journal of Information and Management System*, 27(4): 379-403.
- Lai, Y. C. & Sarkar, S. (2017a), "Gender Equality Legislation and Foreign Direct Investment: Evidence from the Labor Market of Taiwan ROC", *International Journal of Manpower*, 38(2): 160-79.
- Lai, Y. C. & Sarkar, S. (2017b), "Do High FDI Indian Firms Pay Low Wages & Have Higher Output?", *Indian Journal of Industrial Relations*, 52(3): 432-42.
- Lee, J.S. & Wu, H.L. (1996), "The 1984 Fair Labor Standards and Its Impact on Industrial Development in the Republic of China on Taiwan", in Lee J.S. (ed), *The Labor Standards and Economic Development*, Taipei: 147-72
- Lee, L. F. (1983), "Generalized Econometric Models with Selectivity", *Econometrica*, 51(2): 507-12.
- Lemmon, M. L. & Lins, K.V. (2003), "Ownership Structure, Corporate Governance, and Firm Value: Evidence from the East Asian Financial Crisis", *Journal of Finance*, 58(4): 1445-68.
- Lin, Y. L. (2009), "Employment Protection and Wages", Working Paper Economics, fju.edu.tw
- Mitton, T. (2002), "A Cross-firm Analysis of the Impact of Corporate Governance on the East Asian Financial Crisis", *Journal of Financial Economics*, 64(2): 215-41.
- Neumayer, E. & Soysa, I.D. (2005), "Globalization and the Right to Free Association and Collective Bargaining: An Empirical Analysis", *World Development*, 33(1): 43-63.
- Noorbakhsh, F., Paloni, A. & Youssef, A. (2001), "Human Capital FDI Inflows to Developing Countries", *World Development*, 29(9): 1593-1611.
- Rhee, Y. W., and Belot, T. (1990), *Export Catalysts in Low-income Countries: a Review of Eleven Success Stories*, The World Bank.
- Sarkar, S. & Lai, Y. C. (2009), "Foreign Direct Investment, Spillovers and Output Dispersion – The Case in India", *International Journal of Information and Management Science*, 20(4): 491-503.
- Vijaya, R. M. & Kaltani, L. (2007), "Foreign Direct Investment and Wages: A Bargaining Power Approach", *Journal of World-system Research*, 13(1): 83-95.