

ความอ่อนไหวของค่าจ้างแรงงานต่อการลงทุนทางตรงจากต่างประเทศ : การวิเคราะห์ที่ถูกกลั่นลีบในนโยบายส่งเสริมการลงทุนทางตรงจากต่างประเทศ

Wage-rate Sensitivity of Foreign Direct Investment :  
A Neglected Analysis in FDI Policy

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### บทคัดย่อ

การลงทุนทางต่างประเทศ (Foreign Direct Investment: FDI) นับเป็นปัจจัยสำคัญประการหนึ่งที่ผลักดันการเติบโตของประเทศไทย ด้วยเหตุนี้ นักวิชาการจึงให้ความสนใจอย่างต่อเนื่องในการศึกษาเกี่ยวกับปัจจัยดึงดูดการลงทุนทางต่างประเทศ ทำให้วรรณกรรมเกี่ยวกับปัจจัยดึงดูดการลงทุนทางต่างประเทศมีจำนวนมาก และมีอิทธิพลสูงทั้งในวงการวิชาการ และผู้กำหนดนโยบาย

แม้ว่าการศึกษาที่ผ่านมาสรุปตรงกันว่า ค่าจ้างแรงงานมีความสัมพันธ์เชิงผกผัน ต่อการลงทุนทางต่างประเทศ กล่าวคือยิ่งค่าจ้างแรงงานสูง จะยิ่งทำให้ความน่าสนใจเข้ามาลงทุนในประเทศนั้นๆ ลดลง อย่างไรก็ตาม ยังไม่เคยมีการศึกษาอย่างชัด แจ้งถึงลักษณะ โดยละเอียดของความสัมพันธ์เชิงผกผันดังกล่าว ทำให้เกิดข้อจำกัดในการสร้างข้อเสนอแนะที่เป็นรูปธรรมและเป็นประโยชน์ในทางปฏิบัติ

บทความนี้ มุ่งที่จะแสดงให้เห็นว่า การศึกษาความอ่อนไหวของค่าจ้างแรงงานต่อการลงทุนทางต่างประเทศ สามารถให้เกิดความเข้าใจในพฤติกรรมของผลกรอบที่ค่าจ้างแรงงานมีต่อการลงทุนจากต่างประเทศ ทำให้สามารถคาดเดาระยะเวลาที่การลงทุนทางต่างประเทศเข้ามายังประเทศหนึ่งๆ จนถึงเมื่อตอนการลงทุนออกไปยังประเทศอื่นที่มีค่าจ้างแรงงานถูกกว่า อันจะเป็นประโยชน์ต่อการวางแผนพัฒนาประเทศ และมาตรการในระยะยาว ไม่ว่าจะเป็นค้านการวางแผนระบบโครงสร้าง สาธารณูปโภค ปริมาณเงินทุน รวมทั้งทรัพยากรมนุษย์

### Abstract

As foreign direct investment (FDI) has become a major driver of a country's growth, literature on FDI determinants has won scholars's continuous attention and gained significant space and momentum in the FDI literature. Although the inverse relationship between wage rate and foreign direct investment has been empirically confirmed, there has been no effort to derive the insight into the specific behaviors of the relationship. The absence of such insight, therefore, limits the scope of practical recommendation. This paper, as a result, aims to conceptually suggest that sensitivity analysis of FDI provides useful information for policymakers in predicting the length of time during which competitive wage rate of the country holds. This in turn helps policymakers craft appropriate long-term plans on infrastructure, capital stock, and human resource of the country.

**คำสำคัญ :** การลงทุนทางตรงจากต่างประเทศ, ค่าจ้างแรงงาน, การวิเคราะห์ความอ่อนไหว, ปัจจัยคงคุณค่าลงทุนทางตรงจากต่างประเทศ

**Keywords :** Foreign Direct Investment, Wage rate, Sensitivity Analysis, FDI determinants

## Introduction

National policy to attract foreign direct investment (FDI) has become a major issue as it determines a country's growth through technology spillover, employment, and balance of payment improvement. Whether it is the cause or effect, the world FDI volume has outgrown trade volume in the past fifteen years (Blonigen, 2005; Hill, 2007). What many national policy-makers may overlook, however, is that FDI has its reasons to enter when particular conditions are met and to leave when the conditions dissipate as the country's situation changes.

The recent phenomenon that FDI in some industries, especially the labor-intensive ones, are deviating from and moving out of Thailand to other countries with relatively more competitive labor cost, such as Vietnam, concerns policymakers and the business community. While multinational entities (MNE's) freely move their investments wherever most efficient, the host country has no other choice but to carefully craft a long-term national policy of FDI, not only to attract FDI but also to pre-

pare for the next step when it leaves.

Thailand has enjoyed receiving FDI in the past seventeen years as a result of successful monetary policy (financial liberalization in 1990) and competitive labor costs and skills. However, after China and Vietnam opened to free trade and investment, the two countries have become an emerging target for FDI. Among many transition-specific factors, the competitive wage rates of these two economies have become the focus of decisional criteria. In light of proximity, Thailand is probably most affected from Vietnam's emergence. Nevertheless, while Vietnam can enjoy the stream of inward FDI today, it has to prepare for the departure of FDI when its wage rate is no longer competitive in the future. Compared to other macroeconomic factors, however, wage rate is relatively more predictable. It tends to increase over time, as a country's economy advances, thus making FDI relatively predictable as well.

Since Hymer's (1976) seminal thesis on FDI and MNE's was posthumously published in 1976, sixteen years after it had been presented,

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\*In fact, Vietnam's long-term higher education plan dictates that the country be science-oriented by emphasizing on pure science, information technology, and bio-technology education. By the next 10 years, Vietnam is expected to rely more on science-based industry, and less on labor-intensive industry, hopefully by the time when the labor-intensive FDI moves out.

FDI has won scholars' continuous attentions to explore it in its many different dimensions (Calvet, 1981). Attempts to comprehend the impact of wage rate on FDI decision-making are found in the literature focusing on FDI determinants. Although the two most recent studies (Bitzenis, 2003; Blonigen, 2005), which aimed to comprehensively review the literature focusing on FDI determinants, surprisingly neglected

wage rate, much literature supports its effect on FDI decision-making (Amaro & Miles, 2006; Bevan & Estrin, 2004; Janicki & Wunava, 2004; Carstensen & Toubal, 2004; Girma, 2002; Billington, 1999; Kyriacos & Stilianos, 1996; Bajor-Rubio & Sosvilla-Rivero, 1994; Nigel, 1993; Fedderke & Romm, 2006; Salehizadeh, 2005; Tung & Cho, 2001; Yang, Groenewold & Tcha, 2000; Wei, Liu, Parker, & Vaidya, 1999).

**Net Flow of Foreign Equity Investment Classified by Sector**

	1989	1990	1995	2000	2005	2006	2007
<b>Industry</b>	20,129	20,649	15,086	46,829	124,835	134,899	147,850
Food & sugar	1,854	1,022	952	3,790	-566	3,022	8,345
Textiles	747	1,707	1,174	1,437	3,337	-801	2,182
Metal & non metallic	2,747	1,470	1,995	5,523	8,476	12,315	19,843
Electrical appliances	7,511	8,748	8,469	9,157	37,096	36,733	11,430
Machinery & transport equipment	974	1,981	2,974	12,131	49,758	44,584	48,898
Chemicals	2,108	2,011	1,726	2,791	16,522	5,952	9,028
Petroleum products	8	0	-4,195	2,884	-2,328	13,054	10,305
Construction materials	73	16	633	2,042	789	280	1,058
Others	4,109	3,693	1,358	7,073	11,752	19,761	36,762
Financial institutions	1,401	1,163	643	5,267	62,112	85,282	54,378
Trade	5,065	10,100	10,716	21,392	16,352	23,324	39,965
Construction	3,174	3,209	832	132	1,472	-4,015	2,055
Mining & quarrying	576	1,125	1,214	688	-1,438	7,737	21,177
Agriculture	564	416	278	20	507	-41	56
Services	1,201	1,079	2,038	19,715	14,793	12,813	21,576
Investment	0	0	-2,163	-2,001	-62	82,951	11,063
Real estate	5,212	4,785	18,544	3,087	1,079	3,229	39,744
Others	86	473	4	18,780	-179	-2,937	14,807
<b>Total</b>	<b>37,408</b>	<b>43,000</b>	<b>47,192</b>	<b>113,910</b>	<b>219,472</b>	<b>343,242</b>	<b>352,672</b>

Nevertheless, these empirical works simply suggested that wage rate in the host country negatively affected the locational FDI decision, with no further insight into the behaviors of the effect. The scope of the findings, therefore, limited the scope of the recommendations. While the finding did quench scholars' thirst for comprehension of FDI behaviors, it was reluctantly and ineffectually used to make recommendations to policymakers because scholars could not suggest that governments keep wage rate low in order to attract FDI.

This paper aims to prove that wage rate sensitivity analysis of FDI provides useful information that can benefit policymakers in predicting the length of time during which competitive wage rate of the country holds. This, in turn, helps policymakers make appropriate long-term plans on infrastructure, capital stock, and human resources of the country.

#### **Literature on FDI determinants and wage rate**

Considered an engine of a country's growth, FDI has been explored in two major strands: the impact of FDI on a country's growth and FDI determinants. Both strands of

the literature aimed to suggest that policymakers create favorable conditions to attract FDI.

The very first literature on FDI determinants dates back as early as 1960: *The international operations of national firms: A study of direct foreign investment*, Hymer's (1960) thesis at MIT. He distinguished direct from portfolio investment. He also postulated that FDI existed, despite the fact that local firms had better information of local market, because (1) foreign firms possessed a countervailing advantage over local firms, and (2) the market for sale of this advantage was imperfect. It was Kindleberger (1969) who refined and delineated the "market imperfection" as a cause of FDI. He specifically classified market imperfection into four categories: (1) imperfection in goods, (2) imperfection in factor markets, (3) scale economies, and (4) government-imposed disruption. Attempting to encompass new developments in the field of FDI determinants, Calvet (1981) synthesized FDI theories and re-classified market imperfection into market disequilibrium hypotheses, government-imposed distortions, market structure imperfections, and market failure imperfections.

After the theory synthesis by Calvet (1981), scholars in the field of FDI applied the

existing FDI theories in numerous empirical research studies. Some focused solely on one particular determinant, while others tested various determinants simultaneously. Blonigen (2005) conducted a comprehensive review of empirical literature on FDI determinants. In his work, FDI determinants were classified into two groups: firm characteristics and external factors.

Firm characteristics that affect FDI decision-making are derived from transaction cost theory and the ownership-location-internalize (OLI) paradigm. The transaction cost theory was first introduced by Coase (1937) and later refined and operationalized by Williamson (1975). While the nature of public goods of intangible assets specific to the firm explain multiple-plant decision, the transaction cost theory gives a more complete explanation to why it has to be in the FDI form. The OLI paradigm developed by Dunning (1988) takes a step out of the firm's boundary to include a location-specific advantage to explain the locational decision of FDI. Firm characteristics, however, are relatively understudied as a result of their inherently unobservable nature (Blonigen, 2005). According to the review of Blonigen, scholars having conducted empirical studies on firm-specific assets including Mork and Yeung (1992) who

used R&D and advertising intensity to proxy firm-specific assets, and Kogut and Chang (1991) and Blonigen (1997) who studied Japanese firms' acquisition FDI in the U.S. to access firm-specific assets.

Empirical studies on external factors affecting FDI decision-making mostly use partial equilibrium analysis. Frameworks of these studies are based in industrial organization and finance. Therefore, the tested factors are macro-economic factors. These factors include *exchange rate effects* (Froot & Stein, 1991; Steven, 1998; Klein & Rosengren, 1994; Blonigen, 1997; Cushman, 1985; Campa, 1993; Goldger & Kolstad, 1995); *taxes* (de Mooij & Ederveen, 2003; Hartman, 1984, 1985; Slemrod, 1990; Scholes & Wolfson, 1990; Auerbach & Hassett, 1993; Swenson, 1994; Hallard-Dreimeier, 2003; Blonigen & Davies, 2004); *institutions* (Wei, 2000a, 2000b; Hines, 1995); *trade protection* (Grubert & Mutti, 1991; Kogut & Chang, 1996; Blonigen, 1997); and *trade effects* (Lipsey & Weiss, 1981, 1984; Grubert & Mutti, 1991; Blonigen, 2001; Head et al., 1995; Hoshi et al., 1991; Belderbos & Sluwaegen, 1996; Blonigen et al., 2005).

The conclusion about the body of literature of FDI determinants, perhaps, is as Bitzenis (2003) described: "... no theory dominates ..."

In a similar fashion as Calvet (1981), Bitzenis reviewed and synthesized theories determining FDI. While Calvet's work was at the conceptual level, Bizentis' was at the variable level. He collected 69 variables determining FDI decision-making in a literature review from 1937 up to 2000 and categorized into 9 groups: i.e., market hunters, strategic market hunters, factor hunters, efficiency hunters, location hunters, exploiting ownership advantages, financial hunters, political reasons, and overcoming imperfection, which he collectively called the "Universal Model of Theories Determining FDI."

#### **Wage-rate as a determinant of FDI**

It seems that wage-rate received limited attention from the three comprehensive reviews of FDI determinant literature (Calvet, 1981; Bitzenis, 2003; and Blonigen, 2005). In fact, Bitzenis did slightly mention about labor, under the "factor hunters" category, but in the dimension of its "availability." However, the FDI literature from 1999 to 2006 appears to have wage rate and labor cost empirically tested in at least 13 studies.

Of the thirteen studies, only one by Amaro and Miles (2006) tested the sole effect of wage rate on FDI decision. They observed that

middle-income developing countries such as Brazil, Malaysia, and Mexico, after having benefited from FDI inflow, started to fear losing FDI to new, lower-wage countries. They found that wage rate was still an important FDI determinant as well as infrastructure quality.

The other studies tested wage-rate together with other macro-economic factors determining FDI decision-making. It appears that countries in transitory stage, especially those in Central and Eastern Europe and China, have received increasing attention. Three of the twelve studies were specifically on FDI in Central and Eastern Europe, two on FDI in China, and one in South Africa. FDI in developed countries was studied in four research studies: three in the United Kingdom, one in the United States, and one in Spain.

Bevan and Estrin (2004) used a panel dataset of bilateral flows of FDI from Western European countries to Central and Eastern European ones. They found that unit labor cost, gravity factors, market size, and proximity were the most important FDI determinants. Janicki and Wunnava (2004) conducted a similar study, focusing on eight Central and Eastern European candidate economies awaiting accession into the European Union: i.e., Bulgaria, Czech Republic,

Estonia, Hungary, Poland, Romania, Slovak Republic, and Slovenia. The study revealed that key FDI determinants were the size of the host economy, the host country risk, labor costs in the host country, and openness to trade. Carstensen and Toubal (2004) used dynamic panel data methods to examine FDI determinants in Central and Eastern European countries. The study statistically confirmed traditional and transition-specific FDI determinants. Traditional determinants included market potential, low relative unit labor costs, a skilled workforce and relative endowments, while transition-specific determinants were method of privatization and country risk.

Girma (2002) conducted a study on non-EU FDI in the United Kingdom. The study concluded that FDI determinants changed in response to the challenges and opportunities created by increasing economic integration. FDI determinants also depended on types of FDI. In this study, acquisition FDI appeared to be more responsive to the size of European markets and unit labor costs relative to the rest of the EU, and less sensitive to the local market size. Billington (1999) analyzed locational decision-making of FDI in the United Kingdom using two models: a multi-country model, containing

seven industrialized countries, and a multi-region model, consisting of the eleven regions of the United Kingdom. At a country level, market size variables (income and growth), unemployment, level of host country imports and certain policy variables (corporate tax and interest rates) were significantly confirmed. At the regional level, population density, unit labor cost and unemployment were significantly confirmed. Nigel (1993) constructed a theoretical model of FDI and empirically examined FDI in the United Kingdom during the 1980's. He found that relative factor prices were an important determinant of FDI, with investment becoming more sensitive to movements in relative labor costs in the 1980's.

Salehizadeh (2005) studied the relationship between FDI inflow and the economic growth of the United States. The results showed a rising share of the American labor force as being employed by these affiliates, and that FDI inflow favored high-wage industries and sectors. The study also found a positive and significant relationship between FDI and U.S. economic growth. In a study on FDI in Australia, Yang, Groenewold, and Tcha (2000) found that interest rate, wage changes, openness of the economy and a variable representing industrial disputes

were important FDI determinants. Bajo-Rubio and Sosvilla-Rivero (1994) examined the relationship between gross FDI inflow in Spain, during the period from 1964 to 1989, and macroeconomic variables. The study found significant and negative effects for the user cost of capital and the unit labor cost only for manufacturing and non-manufacturing FDI, respectively, and not for the total gross FDI.

In a study on FDI in South Africa, Fedderike and Romm (2006) found that determinants of FDI lay in the net rate of return, as well as the risk profile of the FDI liabilities, assurance of property rights, market size, wage moderation, lower corporate tax rate and full integration of the South African economy into the world economy.

The two studies on FDI in China include Tung and Cho (2001) and Wei, Liu, Parker and Vaidaya (1999). Controlling for infrastructure, unemployment rate, wage rate and agglomeration economics, Tung and Cho found a relationship between tax rates and incentives and FDI inflow. Adding to traditional determinants of FDI such as level of international trade, wage rate, R&D manpower, GDP growth rates, improvement of infrastructure, rapid advances in agglomeration, and preferential policies, Wei,

Liu, Parker and Vaidaya found that closer ethnic links with overseas Chinese attracted relatively more pledged FDI.

### Sensitivity analysis of wage rate to FDI

As previously argued, while these studies successfully made clear statements about the importance of unit labor cost on FDI decision, they failed to provide any deeper suggestions to policymakers. The confirmed significance of wage rate could not, in practice, suggest that a country should keep its wage rate at a favorable level to attract FDI. By implication, this could mean to keep the standard of living low and simply welcome human rights movements. It is the intention of this study to suggest that a sensitivity analysis, as opposed to a mere test of significance level, of wage rate to FDI would benefit the crafting of national policy on FDI.

Sensitivity is the investigation of potential changes and errors in the parameter values of any economic model. Sensitivity analysis has been applied to a wide array of issues. Pannell (1997) groups the uses of sensitivity analysis into 4 main categories; decision making or development of recommendations for decision makers, communication, increased understanding or quantification of the system, and model

development. An example of applying a sensitivity analysis to FDI issue is found in a study by De Mooij and Ederveen (2003). In the study a sensitivity analysis is used to examine the impact of tax on FDI. They found a median tax-sensitivity of FDI of -3.3 across twenty-five studies.

The gist of sensitivity analysis is to observe the rate of change (the slope) of an activity level or of the objective function with respect to changes in a parameter. In the case that unit of measurements of the observed parameters are not comparable elasticities have to be calculated. Elasticities simply are measures of the percentage change in a dependent variable divided by the percentage change in an independent variable, have to be calculated.

Among many FDI antecedents, changes in wage rate are most predictable. One can expect only an increase in wage rate as time passes by. As a country's economy advances, so do standard of living and wage rates. A study on wage rate sensitivity of FDI will show the fashion of the impact of increases in wage rate on FDI. The result of the study will indicate the duration that FDI of an industry will remain in a country before the wage rate becomes unbearable, thus leading to a decision to investment

reduction and new investment in another country. As each industry depends on different types of labor to a different degree, it is appropriate that there be an analysis control for industry.

### Conclusion and future research

Using a sensitivity analysis, one can explore the manner and pattern of impact that changes in wage rate has on foreign direct investment. The pattern of impact is useful for making a more accurate prediction of the duration that FDI of an industry will remain in Thailand. This, in turn, is useful for long-term planning of the country in various dimensions. Technology transfer, which is one of the benefits that FDI brings in, will be more efficiently planned provided that the duration of FDI is known. National policy can be more precise in phasing the long-term plan to transfer technology. This helps prevent technology transfer from not happening before FDI moves out.

The analysis will also greatly help national educational policy in planning to produce sufficient and relevant human resources. As a country advances and relies more on FDI, educational institutions may blindly produce graduates with irrelevant skills, creating an over-supply of work force in some areas and an

undersupply in others. Not only does it help the in-feeding process of labor, but also the analysis will help to plan for re-training programs for

labor whose foreign direct investors decide to pull out the stakes.

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