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# Impact of Labour Dynamics on Foreign Direct Investment Inflows in Asia

**S.G.U.S. Chandrarathne**
University of Sri Jayewardenepura

**P.J.S. Fernando**
University of Sri Jayewardenepura

**R.M.A.K. Rathnayake**
University of Sri Jayewardenepura

## Abstract

*This paper examines the impact of labour dynamics, i.e. skill level of labour force, labour cost and female labour force participation, on Foreign Direct Investment (FDI) inflows in Asia. Employing secondary data of 31 Asian countries from 2000 to 2015, we analyse the impact of labour dynamics on FDI inflows separately for 'low income and lower-middle income' (LLMI) countries and 'high income and upper-middle income' (HUMI) countries in Asia. Besides, regional differences in Asia are also analysed. The panel data analyses suggest that cost and skill-level of labour are the key labour dynamics that attract FDI inflows to Asia. In addition to labour dynamics, large-market size and infrastructure improvements are also significant determinants of FDI inflows. However, these determinants are significantly different across Asia. FDI inflows into HUMI countries were attracted by large market size, improved infrastructure and low female participation to the labour force. In contrast, the availability of a skilled labour force and high female participation to the labour*

**Corresponding Author**:
S.G.U.S. Chandrarathne, Department of Business Economics, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, E-mail: udeshika@sjp.ac.lk

*force and improved infrastructure were key determinants to attract FDI inflows into LLMI countries. Findings clearly revealed that skilled labour is a key determinant of FDI inflows to LLMI countries. Therefore, developing countries in Asia can attract resource seeking FDI inflows by investing in human capital and developing infrastructure for knowledge-intensive industries.*

**Keywords**

*Asia; Foreign Direct Investment; Labour Dynamics; Panel Data*

## Introduction

Asia is the largest and most populated continent with 4.4 billion people in the world and the 21st Century is expected to be the Asian Century. The continent comprises of world's leading economies such as China, Japan, South Korea, Singapore and India. In addition to these geo-economic factors, increasing inflow of Foreign Direct Investment (FDI) into Asia differentiate the continent from the rest of the world. While Asia accounts for the largest and increasing share of FDI inflows in the world, which is 42.62% in 2018 (United Nations Conference on Trade and Development [UNCTAD], 2019), a stagnated or deteriorated flow of FDI is observed in other continents.

Asia is a combination of several sub-regions that comprise of East Asia, South-East Asia, South Asia and Middle East.[1] Among them, East Asia and South-East Asia are the most attractive sub-regions for FDI inflows. However, South Asia attracts an insignificant level of FDI inflows. In 2018, the global share of FDI inflows to South Asia was 4.18% of the global FDI inflows whereas East Asia accounted for 22.31% of the same (UNCTAD, 2018). Accordingly, some regions are highly capable of attracting FDI, while others remain weak. Therefore, it is crucial to understand the factors that influence the FDI inflows and their regional differences to make development policies.

Due to the diverse culture and demographic factors in Asia, there exist many differences in terms of labour such as skill level of the labour force, labour cost, gender participation and age structure of the labourers. These differences among labourers are termed as labour dynamics. In Asian context, some sub-regions and countries possess high quality, skilled labour force while other countries have unskilled labourers. For instance, India and Indonesia rank

[1] Asian continent as defined by the World Bank

as medium Human Development Index (HDI) countries, while other countries rank as very high and high HDI countries.

There are differences in cost of labour within Asia, as well. According to Global Wage Database (2014/2015), East Asia is known for high labour cost region while South-East Asia is comparatively a lower labour cost region in Asia. Female labour force participation rate in Asian region varies among countries. According to World Development Indicators (2016), female labour force participation rate in China and India are decreasing while the same rate is increasing in Hong Kong, Singapore and South Korea. However, a very low female labour force participation rate is observed in Middle-East countries and it is stagnated in South-East Asian countries such as Indonesia, Thailand, Malaysia and Vietnam. Accordingly, labour dynamics in Asia is clearly noticeable.

The differences in FDI inflows in to Asia could be attributed to the differences in labour dynamics. Even though several theories and empirical results reveal that highly skilled-labour attracts a higher amount of resources, statistics in Asia show some contradictory results. Countries with medium HDI attract more FDI than that of very high HDI countries. Additionally, in terms of labour cost, the theory suggests countries and regions with low labour cost attract a higher amount of resources. However, in Asia, some countries with high labour cost attract more FDI to those countries. Further, though in some countries female labour force participation rate has declined, those countries attract more FDI than that of countries with higher female labour force participation rate.

This contradictory situation in Asian region can be identified in sub-regions of Asia as well. For instance, the country with highest HDI value in South Asia; Sri Lanka, attracts the lowest FDI among India, Pakistan, Bangladesh and Sri Lanka. Pakistan recorded the lowest skill level out of the top four countries and records the second highest FDI to the South Asian region. Considering the cost of labour, Pakistan records the highest minimum statuary wages as per International Labour Organization (ILO) (2014), but still, Pakistan records higher FDI than Sri Lanka and Bangladesh. India shows a decreasing female labour force participation rate, however, it has secured the lion's share of FDI inflows to South Asia. In addition, a skilled and high quality labour force can be seen in Singapore, Hong Kong, Japan, South Korea, Qatar, Cyprus and Saudi Arabia. However, compared to those countries, Indonesia and Vietnam with medium level human capital, and India with lower human capital have attracted more FDI inflows. According to Global Wage Report (2015), countries having

relatively high wages such as Singapore, Japan, South Korea and Hong have attracted more FDI than Cambodia, Pakistan and Vietnam, which depict relatively lower wages. Accordingly, it is observed that the countries within the same sub-region display an irregular relationship between labour dynamics and FDI inflows. Therefore, this study examines the impact of labour dynamic; skill level of the labour force, wage rates, and gender participation to labour force, on FDI inflows in Asia.

Theoretical and empirical findings on the relationships among FDI inflows and its determinants are multifaceted. However, the emphasis of labour related conditions on FDI inflows are not sufficiently explained in the literature. Therefore, findings of this research would be helpful in identifying potential sectors and regions in Asia to promote FDI inflows.

The rest of this paper is structured as follows. Section 2 presents the theoretical and empirical findings of FDI and its determinants. Model specification and the methodology is presented in Section 3 and empirical findings derived using panel data model are presented in Section 4. Discussion section is presented in Section 5 and the conclusions are presented in Section 6.

## Literature Review

FDI significantly influences on income, production, prices, employment, development and general welfare (Demirhan & Masca 2008), and economic growth of the host country (Blomstrom et al. 1992; Borensztein et al. 1998). FDI is not just a source of finance and employment for developing countries, it is a medium for acquiring skills, technology, organizational and managerial practices and markets. And, it is an effective channel to transfer technology, foster growth in developing countries and achieve economic growth. Therefore, less developed countries place higher expectations on FDI than their counterparts to eradicate resource and skill constraints (Noorbakhsh et al., 1999). FDI has significantly promoted economic growth in China through domestic capital formation, increasing exports, creating employment, improve efficiency of resource allocation, transferring technology to China and promoting exports (Sun 1998).

### *Determinants of FDI Inflows*

Determinants of FDI inflows are multifaceted. The behaviour of FDI inflows can be theoretically explained by Product Life Cycle Theory, Supply Chain Model and Market Imperfection model. Product Life Cycle Theory explains that

the production plants shift to highly advantageous regions of the world with the maturity of the product. Accordingly, if the production is highly labour intensive, such production processes are shifted from advanced countries to countries with cheap labour. Therefore, based on the explanations of Product Life Cycle theory, FDI inflows depends on the cost of labour in the destination country.

According to Supply Chain Model, business processes are carefully analysed in terms of high value generating processes and lower value creating processes. Low value creating activities are outsourced and relocated in comparatively low-cost regions to create a higher value to final customer. Subsequently, low-cost destinations become preferred candidate to attract FDI inflows in the world. Again, predictions of Supply Chain Model also similar to that of Product Life Cycle theory; FDI inflows depends on the cost of labour in the destination country.

Market imperfections generate opportunities to gain an extra advantage by exploiting the situation in the market. Successful firms can utilize these advantages to outperform their competitors. Therefore, as predicted by the Theory of Market Imperfection, the key factor that determinants FDI inflows are the availability of such market imperfections in the location.

In addition to these theoretical explanations, empirical findings suggest that availability of local inputs such as natural resources, geographical location, the size of the market, the position of an economy, the culture and the political environment, factor prices, transport costs and the elements of economic policy of the government such as trade policy, industrial policy, budget policy and tax policy as the key determinants of FDI inflows (Kok & Ersoy 2009). There are ample studies that have been conducted to identify the determinants of FDI inflows; however, the findings are inconclusive.

***Labour Dynamics and FDI***

FDI decisions of investors may be influenced by skill level of labour, cost of labour, average age of population and the gender differences in labour force in a particular location. Those labour related characteristics are termed as labour dynamics in this study. The following sections review impact of labour dynamics on FDI inflows.

***Skilled Labour***

Human capital is stated as an important determinant of FDI. A country seeking to attract FDI must meet the required level of education, skills and competence level within the labour force (Noorbakhsh et al., 1999; Glass & Saggi 2002; Pandya 2010; Chandrarathne et al., 2017). Moreover, it is argued that human capital is more important than low wages to attract FDI inflows in to developing countries (Noorbakhsh et al., 1999). Wong and Tang (2011) found that emerging sectors with skilled workforce such as manufacturing and service sector in Singapore attract more FDI creating employment in those sectors.

Chandrarathne et al. (2017) found that skill level has a positive impact on FDI inflows in South Asia. Therefore, they recommend to invest in human capital to attract more FDI inflows into the region. As Noorbakhsh et al. (1999) argue, the human resources are now perhaps the key competitive asset for firms as well as for countries. Therefore, nations can attract FDI by creating the human capital that are in demand by the foreign investors.

FDI inflows also can make a considerable contribution to development of human capital in developing countries by providing education and training (Noorbakhsh et al., 1999; Wong & Tang 2011; Baranwal, 2014). Formal education is provided by MNCs in the form of business management and it improves the capabilities of locals. Training and other learning opportunities are also provided to the staff by those companies which are different from those provided by local firms and it helps to enhance vocational, technical and management skills (Noorbakhsh et al., 1999).

Measuring human capital and skilled level is questionable. Average years of schooling is recognized as one of the best indicators of skill level by many authors (Hayami & Godo 2005). In addition, secondary gross enrolment is used to denote skill level of labourers in empirical research (Noorbakhsh et al. 1999; Pandya 2010). Pandya (2010) employeed the highest level of education completed as a proxy to indicate the education and skill. However, only capturing education is not a sufficient measure to denote the skill level.

***Labour cost***

According to the Prodcut Life Cycle theory and Supply Chain theory, low wages attract FDI in to host countries. In labour intensive manufacturing, labour cost is an important part of total cost. Lower the labour cost in the host country, higher the FDI attraction for that country. Relative wage rates are included in the Dunning's Ownership, Location and International framework (Chakrabarti

2001). Accordingly, resource seeking FDI will flow to regions with favourable resource endowment. Therefore, MNCs are moving toward low labour cost regions to establish their production plants.

Several empirical studies also concluded the negative relationship between FDI and cost of labour. That is cheap labour attracts more FDI to host economies. Some researchers have classified wage rate as the most crucial determinant of all potential determinants of FDI (Chakrabarti 2001; Shamsuddin 1994).

Sahoo (2006) identified labour force growth, which leads to availability of cheap and abundant labour, as the main determinant of FDI inflows into South Asian countries. Lai and Sarkar (2011) studied the FDI and labour cost in India and they found that low wages attract FDI to India. Also they found that foreign firms pay a higher wage than that of local firms. Ramasamy and Yeung (2010) conducted a panel data analysis for the provinces in China and found that FDI inflows to China comes with the motive of low cost production as China holds relatively cheap labour compared to their counterparts.

Lucas (1993) stated that there is a positive association between cost of labour and FDI inflows which is contradictory to the conventional wisdom. At a point where MNCs do not focus on labour cost, skill level of labour force is expected to be high in order to make FDI decision. Further, he emphasised that the high skilled labours cannot compromise with cheap wages. Demirhan and Masca (2008) also cameup with a similar finding for developing countries. Accordingly, labour cost exhibits a positive relationship to FDI. Hence, low wage is not a crucial factor for FDI inflows for developing countries. Further, they have noted that the skill level of the labour force is expected to be a determinant of FDI inflows rather the cheap wage (Demirhan & Masca 2008).

In contrary, many scholars claim that there is no positive relationship between FDI inflows and wage rate. Noorbakhsh et al. (1999) found that wage is not a significant factor to attract FDI to developing countries. A similar findings were derived by Edwards (1990), Aqeel et al. (2005), and Amaro and Miles (2006) on the relationship between wage rate and FDI inflows. A negative relationship between FDI inflows and wages is identified by in some other studies as well (Culem 1988; Wheeler & Mody 1992).

***Gender Differences in Labour force***

Further, when focusing on gender differences, social and religious customs play a big role in labour force participation decision of households. Male and female composition of the labour force represents those gender differences. Some industries are highly female based while others are male dominated industries (Pandya 2010). For an example, gender based employment structure reveals that 85% of apparel industry workers are female workers (Prasanna & Kuruppuge 2013). Pandya (2010) given that there is a negative relationship between women and FDI inflows to a country.

According to the reviewed literature, there are number of determinants identified by various researchers. Also, the results sometime give multiple results in different contexts, different time period based on different methodologies that they have adopted. Also based on the determinants used by the researches those relationship might get varied. Further, according to the proxy variables included to the model, specially due to differences in the model specifications, the results get altered. Hence, there is no universally accepted set of factors which can be considered as true determinants of FDI.

There are ample studies on FDI and its determinants. However, very little has been done on labour dynamics and FDI inflows. Some attempts have been made to analyse the impact of labour related factors on FDI inflows. For instance, Lai and Sarkar (2011) and Shamsuddin (1994) have considered low wages as a determinant of FDI whereas Noorbakhsh et al. (1999) has considered only the skill level of labour. Moreover, gender based labour force participation rate and other labour related characteristics are not captured. This study contributes the lietarture by filling these gaps by extensively analysing the relationship between labour dynamics and FDI inflows in the context of Asia.

## Research Methodology

Following the deductive approach, this study analyses the impact of labour dynamics on FDI inflows in Asia. We employed a panel data (longitudinal) set of 31 Asian countries from South Asia, East Asia, South East Asia, Middle East over the period of 16 years from 2000-2015. The data was collected from World Development Indicators and the International Labour Organization.

The general specification of the empirical model in Equation 1 was developed using market size, openness, infrastructure availability, and labour dynamics as determinants of FDI inflows.

FDI Inflows= $f$ {market size, openness, infrastructure, labour dynamics} ----------(1)

Where, FDI inflows is denoted by FDI net inflows in current US$ as a percentage of GDP (Noorbakhsh et al. 1999; White 2016; Zia et al. 2009; Asian Department Bank 2008); Market size in the host country is illustrated by GDP growth rate (Noorbakhsh et al. 1999; Liu et al. 1997; Cevis & Camurdan 2007); Openness is measured by total trade (summation of import and export) as a percentage of GDP (Golder & Ishigami 1999; Noorbakhsh et al. 1999; Asian Department Bank 2008; Kok & Ersoy 2009); and infrastructure is denoted by mobile subscription (Amaro & Miles 2006; Kok & Ersoy 2009).

Align with the specified objective of the research, three labour dynamics are tested empirically in this study. i.e. skill level of labour force, cost of labourers, and differences in gender participation to labour force. Skill level is captured by Human Development Index (HDI) value. In HDI, health factor is measured by life expectancy at birth and skill factor is measured by average years of schooling. Simply, a healthy and educated labour force reflects a high level of skills and quality of labour force. Hence, HDI value is employed as a proxy for the skill level of employees. Differences in gender participation to labour force is identified through female labour force participation rate. Further, there is a deficiency of satisfactory measurement for the labour of cost variable (Noorbakhsh et al. 1999). Hence, the statutory minimum wage in US$, which was taken from international labour organization is considered as a proxy for cost of labour.

We assume labour dynamics are the key determinants of FDI inflows into Asia. Therefore, three hypotheses were developed as follow to test the impact of labour dynamics on FDI inflows.

*Hypothesis 1: Countries with high skilled labour force attract more FDI inflows to Asia*

*Hypothesis 2: Higher female participation in labour force attracts more FDI inflows to Asia*

*Hypothesis 3: Low cost labour attracts more FDI inflows to Asia*

The Equation I specified above was estimated with several models using alternative samples to differentiate the development level[2] and geographical regions of selected countries in Asia. In Model 01 we employed all Asian countries for the analysis, whereas Model 02 and Model 03 were estimated for "high income and upper middle-income countries" (HUMI) and "low income and lower middle-income countries" (LLMI), respectively. In addition, separate models were specified for sub-regions in Asia namely, South Asia (Model 04), East Asia (Model 05), South East Asia (Model 06) and Middle Asia (Model 07).

## Analysis and Findings

The descriptive statistics of the variables used in Model 01 are presented in Table 01 while the descriptive statistics of other models are given in the appendix.

**Table 1: Descriptive Statistics of Variables Used for Model 01**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 496 | 12bn | 35bn | -4.55bn | 291bn |
| FDIP | 491 | 4.4226 | 7.0617 | -4.6995 | 58.5149 |
| TRADE | 493 | 101.1619 | 83.1491 | 0.16742 | 442.62 |
| GDPG | 492 | 5.4502 | 5.0012 | -33.1008 | 54.1578 |
| MOB | 492 | 68.0916 | 52.2246 | 0.0276 | 235.6124 |
| LFPR | 496 | 45.4984 | 20.2200 | 10.964 | 82.27 |
| HDI | 496 | 0.6810 | 0.1409 | 0.34 | 0.925 |
| WAGEUS | 282 | 413.2162 | 1283.7 | 0.01100 | 14095.75 |

*Note: Refer the appendix for the summary statistics of other models.*

Equation 01 is estimated for the 7 alternative models. The results of the Model 01, Model 02 and Model 03 are given in Table 02.

[2] We classified countries as "high income and upper middle-income countries" (HUMI) and "low income and lower middle-income countries" (LLMI) as per the World Bank classification (2015).

**Table 2: Determinants of FDI inflows to Asia**

| VARIABLES | Model 01<br>Asia<br>Random Effect | Model 02<br>HUMI countries<br>OLS | Model 03<br>LLMI countries<br>Random Effect |
|---|---|---|---|
| GDP growth rate | **0.586**** | **0.599***** | **0.713*** |
| | (2.427) | (3.381) | (1.658) |
| Mobile subscription | **0.110***** | **0.181*** | **0.122***** |
| | (3.412) | (1.720) | (2.951) |
| Trade as a percentage of DGP | 0.00379 | 0.0803 | 0.00381 |
| | (0.198) | (1.366) | (0.1000) |
| Human Development Index | **12.97*** | 16.79 | **13.79*** |
| | (1.854) | (1.609) | (1.805) |
| Female labour participation rate | 0.00905 | **-0.0874***** | **0.0384*** |
| | (0.290) | (-3.824) | (1.776) |
| Wage | **-0.001***** | -0.000344 | -0.00932 |
| | (-7.604) | (-1.467) | (-1.575) |
| Constant | -8.276* | -8.598 | -11.11*** |
| | (-1.807) | (-0.944) | (-2.625) |
| Observations | 265 | 118 | 147 |
| Number of country id | 25 | 16 | 13 |

*Notes: Robust z-statistics in parentheses and *** p<0.01, ** p<0.05, * p<0.1*

According to Table 02, overall suitability of the Model 01, Model 02 and Model 03 are significant at 1% level of significance. Explanatary power of the Model 01 is 21.00% whereas in Model 02; HUMI country analysis, the R-square is 19.16%. According to Model 03; LLMI country Model, R-square overall 34.44%. When we analyse the individual significance of variables, growth of market size is significant with a positive relationship at 5%, 1% and 10% level of significance in Model 01, Model 02 and Model 03 respectively. Mobile subscription recorded as significant in Model 01 at 1% level of significance, Model 02 at 10% level of significance and Model 03 at 1% level of significance with a positive relationship. Trade as a percentage of GDP is not significant in any model.

Table 03 gives the results of sub-regions of Asia. Estimations of Model 04 to 07 are best fitted to the data at 1% level of overall significance. Explanatory powers are 59.02%, 30%, 33.49% and 37.68% for Model 04, 05, 06 and 07 respectively.

**Table 3: Determinants of FDI inflows to sub regions of Asia**

| VARIABLES | Model 04 South Asia OLS | Model 05 East Asia OLS | Model 06 South East Asia Fixed Effect | Model 07 Middle East OLS |
|---|---|---|---|---|
| GDP growth rate | -0.0331 | **1.183**** | **0.211*** | **0.761***** |
| | (-0.966) | (2.570) | (2.167) | (3.606) |
| Mobile subscription | **0.101***** | **0.839***** | **0.0791***** | 0.0427 |
| | (4.490) | (3.684) | (3.735) | (0.799) |
| Trade as a percentage of DGP | 0.00424 | 0.0821 | -0.0213 | 0.0106 |
| | (0.166) | (0.497) | (-0.969) | (0.452) |
| Human Development Index | 0.300 | 10.90 | **29.08***** | **45.95***** |
| | (0.272) | (0.325) | (4.023) | (4.105) |
| Female labour participation rate | **-0.0241***** | -0.374 | **-0.207**** | **-0.220***** |
| | (-6.237) | (-0.873) | (-2.815) | (-3.491) |
| Wage | **-0.0128***** | -0.00259 | -0.00887 | **-0.000249**** |
| | (-3.320) | (-0.687) | (-1.942) | (-2.029) |
| Constant | 2.155** | 7.728 | -2.050 | -26.59*** |
| | (2.622) | (0.162) | (-0.330) | (-3.995) |
| Observations | 59 | 53 | 81 | 72 |
| R-squared | 0.590 | 0.383 | 0.497 | 0.377 |

*Notes: Robust z-statistics in parentheses and *** p<0.01, ** p<0.05, * p<0.1*

The individual significance of variables in Table 03 shows that growth of market size is significant in Model 05, 06 and 07 at 5%, 1% and 10% respectively. Mobile subscription of Model 04, 05 and 06 is significant at 1% level of significance. Trade as a percentage of GDP is not significant in any model.

Labour related variables have recorded a very interesting result. HDI is significant in Model 01 and Model 03 at 10% level of significance and it is

positive. HDI is not significant in Model 02. Female labour force participation rate is not significant in Model 01. However, it is significant at 1% and recorded a negative relationship in Model 02. Further, it is significant at 10% level of significance in Model 03 and there is a positive relationship between female labour force participation rate and FDI. The wage is significant in Model 01 at 1% significance level and the relationship is negative whereas wage is not significant in Model 02 and 03.

Further with reference to sub-regional analysis, HDI is significant at 1% in Model 06 and 07 and it is positive. Female labour force participation rate in Model 04, 06 and 07 give a significant negative relationship with 1%, 5% and 1% level of significance respectively. Wage also shows a negative significant relationship in Model 04 and 07 at 1% and 5% level of significance.

Results presented in Table 02 and 03 are obtained through stationarity variables analysed by Panel Unit Root Test. The model is free from multicollinearity problem. Model 01, 02 and 03, are estimated under random effect model, fixed effect technique and OLS estimates. Hausman test proved the appropriateness of random effect technique for the analysis. Breusch and Pagan Lagrangian multiplier test confirmed the suitability of random effect technique for the Model 01 and 03, whereas it recommended OLS technique for Model 02. Results are adjusted to robust in order to rectify the errors of heteroskedasticity and final result is given in Table 02.

Four alternative estimations are done with regards to the subregions of Asia namely, South Asia, East Asia, South East Asia and Middle East from Model 04 to 07 respectively. OLS estimations are best fitted to Model 04, Model 05 and Model 07. Model 06 was estimated for fixed effect model.

## Discussion

According to results, market growth is a crucial factor in attracting FDI inflows to the region to Asia. Increase in market growth would enhance FDI inflows to Asia, especially in both HUMI countries and LLMI countries. Further, these results are visible in East Asia, South East Asia and Middle East. These findings follow the results of Noorabakhah et al. (1999), Golder and Ishigami (1999), Kok and Eroshy (2009). In addition, infrastructure contributes positively to increase FDI inflows in the region. This result is more visible in South Asia, East Asia and South East Asia. Further, these results are also supported by the

findings of Wheeler and Mody (1992), Amaro and Miles (2006), Demirhan and Masca (2008), and Kok and Ersoy (2009).

Labour dynamics are the major concern of this study. Skill level of labour force is a major factor which analysed under this. Based on the results of Model 01 and Model 03, an increase in skill level of labour force is significant factor which can attract FDI. However, incr ease in skill level in HUMI countries' is not a major concern for FDI attraction. Because, those countries have already achieved a high skill level and hence, the current focus factors are not the skill level. But when it comes to LLMI countries, increase in skill level of labour force is a major concern of investors. However, based on subregion analysis, skill level is significantly focused in South East Asia and Middle East in finding FDI destinations. This result is supported by the empirical evidences of Noorabakhsh et al. (1999), Pandya (2010), and Chandrarathne et al. (2017).

Gender differences to the labour force gives interesting findings in Asia. Female labour participation rate is not significant in Asia according to Model 01. However, based on the Model 02; HUMI country, there is a negative relationship between FDI inflows and female labour force participation rate. This result reveals that further increases in female labour force participation would not increase FDI attraction. According to sub-regional analysis, South Asia, South East Asia and Middle East also show a negative relationship. However, according to the LLMI country perspective (Model 03), there is a significant positive relationship between female labour force participation and FDI inflows. That means, higher female participation in labour force will increase the FDI inflows to these countries.

There is a negative relationship between FDI and labour cost in Asia in terms of monthly minimum wage which is significant. Hence, is given that cheap wages can attract more FDI to Asia according to Model 01, South Asia and Middle East. This result is aligning with findings of Culem (1988) and Wheeler and Mody (1992). However, cost of labour is not significant in 'high-income and upper-middle income' country model and LLMI country model.

## Conclusion and Recommendations

The aim of this paper was to analyse the impact of labour dynamics on FDI inflows in Asia. We employed a panel data set that consists of 31 Asian countries in South Asia, East Asia, South East Asia, and Middle East over 16 years from 2000-2015. The impact of labour dynamics on FDI inflows were

analysed using three alternative samples. In Model 1, the entire sample in Asia was considered, whereas in Model 2 and Model 3, HUMI and LLMI countries in Asia were analysed. Alternatively, regional samples for South Asia, East Asia, South East Asia, and Middle East were analysed in the rest of the models. Other than labour dynamics, i.e. skill level of labour force, labour cost and differences in gender participation for labour force, we employed market size, openness and infrastructure availability in the panel data analyses.

Market size and infrastructure were identified as key determinants of FDI inflows to Asia. In relation to labour dynamics, higher skill levels of labourers and lower labour costs were emerged as the key labour dynamics that determine FDI inflows. In both HUMI and LLMI countries in Asia, larger market size and infrastructure availability were key determinants of FDI inflows. In addition, high skilled labour was a significant determinant in LLMI countries. While female labour force participation has a negative effect on FDI inflows in HUMI, the same had a positive effect on FDI inflows in LLMI countries. The positive effect of female labour force participation in LLMI countries can be justified as the textile and garments industry, which is a female dominated industry, attracts a significant amount of FDI inflows.

This study articulates that Asia has a great potential to attract FDI inflows to sectors which expect a high skill level. This is an emerging trend for LLMI countries in Asia. Further, countries in Asia holds the advantage in low-cost and labour-intensive manufacturing, which in turn, capbale of attarctting resource-seaking FDI inflows to the region. Thus, countries in Asia must consider labour related comperative advantages along with improving infrastructure availability and market size to attract FDI inflows to the region. If the country is a skilled-labour abandon country, it is recommened to focus on knowledge intensive indsutries to attatc FDI inflows. The priority must to given to the labour-intensive industries if the competitive edge lies on low-cost labour. Additionally, the participation of female labourers must be improved in LLMI Asia while assuring the effectiveness of female workers all over the Asia in order to attract more FDI inflows to Asia.

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## Appendices

**Appendix A**: List of Asian countries (Model 01)

| | |
|---|---|
| South Asian countries | India, Bangladesh, Pakistan, Sri Lanka, Afghanistan, Nepal |
| East Asian countries | China, Hong Kong, Japan, Korea Republic, Mongolia |
| South East Asian countries | Singapore, Indonesia, Viet Nam, Malaysia, Thailand, Philippine, Myanmar, Cambodia, Laos |
| Middle East countries | Lebanon, Israel, Jordan, Emirates, Egypt, Iraq, Qatar, Iran, Kuwait, Yemen, Bahrain |

**Appendix B**: List of "high income and upper middle-income countries" (HUMI) - Model 02 (16 countries)

China, Hong Kong, Japan, Korea Republic, Singapore, Malaysia, Thailand, Lebanon, Israel, Jordan, Emirates, Iraq, Qatar, Iran, Kuwait, Bahrain

**Appendix C**: List of "low income and lower middle-income countries" (LLMI) - Model 03 (15 countries)

India, Bangladesh, Pakistan, Sri Lanka, Afghanistan, Nepal, Mongolia, Indonesia, Viet Nam, Philippine, Myanmar, Cambodia, Laos, Egypt, Yemen

**Table 4: Descriptive Statistics of Variables Used for Model 02 (HUMI)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 256 | 20bn | 46.8bn | -2.4bn | 291bn |
| FDIP | 252 | 5.841 | 8.5457 | -4.6995 | 58.5149 |
| TRADE | 255 | 132.0085 | 100.4482 | 19.7981 | 442.62 |
| GDPG | 255 | 4.9980 | 5.774691 | -33.1008 | 54.1578 |
| MOB | 254 | 91.4186 | 50.4737 | 0.07924 | 235.6124 |
| LFPR | 256 | 42.1275 | 16.80613 | 10.964 | 71.242 |
| HDI | 256 | 0.7876 | 0.08170 | 0.592 | 0.925 |
| WAGEUS | 125 | 860.0952 | 1835.426 | 4.933 | 14095.75 |

**Table 5: Descriptive Statistics of Variables Used for Model 03 (LLMI)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 240 | 3.39bn | 7.31bn | -4.55bn | 44bn |
| FDIP | 239 | 2.9270 | 4.6126 | -2.7574 | 43.9121 |
| TRADE | 238 | 68.1120 | 37.6613 | 0.1674 | 178.7674 |
| GDPG | 237 | 5.9367 | 3.9610 | -28.0968 | 21.0206 |
| MOB | 238 | 43.1965 | 41.5369 | 0.02765 | 147.1109 |
| LFPR | 240 | 49.0940 | 22.8094 | 15.042 | 82.27 |
| HDI | 240 | 0.5672 | 0.0939 | 0.34 | 0.766 |
| WAGEUS | 157 | 57.4207 | 55.9641 | 0.012 | 286.3587 |

**Table 6: Descriptive Statistics of Variables Used for Model 04 (South Asia)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 96 | 4.26bn | 9.91bn | -0.006bn | 44bn |
| FDIP | 95 | 1.1059 | 0.9262 | -0.0984 | 4.3187 |
| TRADE | 94 | 49.8453 | 20.5309 | 26.2748 | 137.901 |
| GDPG | 93 | 5.6526 | 3.07711 | -1.5454 | 21.0206 |
| MOB | 94 | 35.4423 | 32.3486 | 0.04410 | 110.5859 |
| LFPR | 96 | 38.3718 | 21.3414 | 15.042 | 81.457 |
| HDI | 96 | 0.5412 | 0.1014 | 0.34 | 0.766 |
| WAGEUS | 63 | 49.5959 | 23.0918 | 24.0733 | 106.9587 |

**Table 07: Descriptive Statistics of Variables Used for Mode 05 (East Asia)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 80 | 48.7bn | 74.3bn | (2.40) | 291bn |
| FDIP | 80 | 9.1216 | 13.2744 | -0.05290 | 58.5149 |
| TRADE | 80 | 126.1884 | 122.3596 | 19.7981 | 442.62 |
| GDPG | 80 | 5.2244 | 4.1816 | -5.4171 | 17.2908 |
| MOB | 80 | 89.5994 | 53.766 | 6.4485 | 235.6124 |
| LFPR | 80 | 54.4239 | 6.5167 | 48.158 | 71.242 |
| HDI | 80 | 0.7939 | 0.1073 | 0.588 | 0.917 |
| WAGEUS | 55 | 514.0726 | 478.7341 | 4.933 | 1627.095 |

**Table 08: Descriptive Statistics of Variables Used for Model 06 (South East Asia)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 144 | 7.89bn | 13.6bn | -4.55bn | 74bn |
| FDIP | 144 | 5.0494 | 5.6193 | -2.7574 | 26.5212 |
| TRADE | 144 | 130.7598 | 102.4478 | 0.1674 | 441.6038 |
| GDPG | 144 | 6.365 | 3.0054 | -2.5258 | 15.2404 |
| MOB | 144 | 64.3507 | 52.2716 | 0.0276 | 155.9222 |
| LFPR | 144 | 63.3868 | 12.5847 | 43.298 | 82.27 |
| HDI | 144 | 0.6430 | 0.1232 | 0.412 | 0.925 |
| WAGEUS | 87 | 80.2453 | 80.5625 | 0.012 | 286.3587 |

**Table 09: Descriptive Statistics of Variables Used for Model 07 (Middle Asia)**

| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| FDI | 176 | 2.84bn | 3.33bn | -1.46bn | 15.3bn |
| FDIP | 172 | 3.54406 | 4.1308 | -4.6995 | 23.5374 |
| TRADE | 175 | 92.9308 | 37.3767 | 32.7265 | 196.4295 |
| GDPG | 175 | 4.6931 | 6.9927 | -33.1008 | 54.1578 |
| MOB | 174 | 78.9370 | 51.7361 | 0.0792 | 231.7632 |
| LFPR | 176 | 30.6926 | 14.5796 | 10.964 | 59.022 |
| HDI | 176 | 0.7369 | 0.1099 | 0.444 | 0.899 |
| WAGEUS | 77 | 1014.897 | 2304.681 | 5.6486 | 14095.75 |

**Table 10: Data Definition and Data Sources**

| | **FDIP** | |
|---|---|---|
| Trade as a percentage of GDP | TRADE | Trade is the sum of exports and imports of goods and services measured as a share of GDP. |
| GDP Growth Rate | GDPG | GDP growth (annual %) |
| Access to mobile phones | MOB | Per 100 inhabitants |

| | | |
|---|---|---|
| Labour Force Participation Rate, Female | LFPR | Labour force participation rate, female (% of female population ages 15-64) (modelled ILO estimate) |
| HDI Value | HDI | A composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living |
| Monthly Minimum Wage US $ | WAGEUS | Statutory nominal gross monthly minimum wage effective December 31st (Local currency)/Foreign Exchange Rate |

*Source: World Development Indicators, World Bank report, 2017; International Labour Organization, 2017*