Prudent Macro Management of the Economy and Inward FDI in ASEAN Member States

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PRUDENT MACRO MANAGEMENT OF THE ECONOMY AND INWARD FDI IN ASEAN MEMBER STATES

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Abstract

The current research work considers the effect of prudent macroeconomic management of the host economy on inward foreign direct investment in Association of South East Asian Nations member states. This research use annual data of nine ASEAN countries namely: Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam for twenty years from 1991 to 2010. The results obtained with random effect panel estimation technique manifests the importance of judicious management of the economy. Steady but relatively slow and predictable decline of the host currency exchange rate have a positive significant effect. However, contrary to expectations inflation though have a negative sway still the effect is insignificant. The conventional FDI location drivers such as market size, development level, and provision of human capital proxied by tertiary education also exert a significant positive sway. Contrary to theoretic wisdom extent of economic liberalisation and primary or secondary education had the expected coefficient but failed to reach the needed significance level.

1. Introduction

One of the most important elements in movement towards globalization is foreign direct investment (FDI). Generally, FDI is defined as an investment by a firm from a country making investment into building, factory or any production unit in a foreign economy. According to UNCTAD (2003) foreign direct investment is an investment involving a long-term relationship and acquiring an enduring interest in and control of a firm of one country (foreign affiliate) by a firm or entity of another country (parent firm). Investment in new production facilities is called green-field investment. FDI may consist of green-field investment as well as privatization of public enterprises. It generates new production capacity and jobs, transfer of technology, research and development, additional capital investments and builds linkages with the international market places (Shah, 2017c). Privatization proceeds are the investment that foreign investors make to acquire any firm or a portion of it in any other country.

The heavily indebted poor nations and low income nations of the world continues to be mostly dependent on bilateral and multilateral aids for their development plans. Nevertheless,

since 1990 total Overseas Development Assistance (ODA) has decreased by more than half, so their dependence on alternative sources of investment, such as FDI, to finance their developmental programs has also amplified. Hence, FDI is now one of the major sources of capital inflows to developing countries.

FDI is different from other major forms of international investments as it is motivated by the long term profit prospects in production activities directly controlled by investors (Tsen, 2005). It raises the level of national welfare, as it results in increase in productivity, employment level, exports and higher pace of technology transfer (Shah, 2013a). FDI not only complements domestic capital sources but also adds to foreign exchange reserves, thus can relax balance of payment constraints (Sahoo, 2006). Being more stable and a long-term investment, FDI can help to circumvent financial crises (Azam, 2010). Besides being the most reliable and consistent source of foreign capital, it also has extensive effects on economic activities, as it transfers financial resources, technological knowhow and managerial information from the source country to the recipient nations and also provides access to new markets, cheaper production facilities and innovative products (Shah, 2011c). FDI also benefits the investing firms, as it helps them to use their resources efficiently (Shah, 2016a).

FDI has grown at a considerable rate since the early 1980s, and its global market has become very competitive. World inflows grew by more than five times, from US $158 billion in 1991 to a peak of US $ 1.5 trillion in 2000 (Appendix 1). Developed countries were the main recipients with a global FDI share of 74.04 % in 1991 and 81.20% by 2000. Total flows to ASEAN fell between 1997 and 1998 and developing countries share in world FDI decreased to 18.30% in 2000 from 41% in 1994. Post the substantial rise in 2000 global FDI inflows fell in the next three years and recovered in 2004. They peaked again at US $ 2.1 trillion in 2007. In 2008 and 2009 global FDI fell by 16% and 37% respectively over the previous year but slightly improved by 5% in 2010. Developed countries inflow decreased to 44% in 2009 related to the last year and their share in global FDI declined to 51% as compared to the peak of 2000. Developing economies inflows increased by 40% in 2004 over the previous year after a substantial decline post 2000. Their share in global FDI increased to 46% in 2010 from 18% in 2000. Developing and transition economies are progressively becoming more attractive for multinational investors, and half of the world FDI inflows now go to them (WIR, UNCTAD, 2013; 2014; 2015).

The Association of South East Asian Nations (ASEAN) countries have welcomed FDI activities to a great extent since the late 1980s. In 1991 the ratio of ASEAN FDI inflows to total world FDI inflows was 8.86% but due to the Asian financial crisis of 1997 FDI to ASEAN dwindled. ASEAN was no more a sought after destination for investment in the eyes of foreign investors and FDI inflows fell to US $ 22.4 billion in 1998 from US $ 30.2 billion in 1996 and the share of ASEAN FDI to total world FDI inflows declined to 3.15% in 1998 from 7.85% in 1996. During the period of 1998-2002 FDI flows to ASEAN fell significantly from US $ 34.09 billion in 1997 to US $ 17.22 billion in 2002, and the ratio of its FDI inflows to the total world FDI inflows declined to 2.76% in 2002 from7.06% in 1997. (UNCTAD, 2014)

With the success of economic restructuring and the recovery of economic growth after the end of the crisis; FDI inflows increased to ASEAN. There was a recovery in FDI inflows to ASEAN countries in 2003, and FDI inflows to the region grew from 17.22 billion U.S dollars in 2002 to 24.51 billion U.S. dollars in 2003 or 4.39% of total world FDI and peaked in 2007, which is 75.65 billion U.S. dollars, or 3.52% of total world FDI (UNCTAD, 2013).

The world economic and credit crisis in 2008 had a depressing impact on FDI flows into ASEAN, FDI declined sharply from 75.65 billion U.S. dollars in 2007 to 47.08 billion U.S. dollars in 2008 and further dropped to 37.88 billion U.S. dollars in 2009. In 2010 ASEAN regained its pre-crises level of 75.65 in 2010 and received 75.8 billion US dollars of FDI inflows as the region sustained to take advantages from the favourable economic conditions and potential investors interests (UNCTAD, 2015). The share of some selected regions and countries in the total world FDI is given as appendix 1.

1.1 Theoretical Background of the Study

Most of the prior literature indicates that countries offering secure and profitable investment opportunities; attract FDI (Shah, 2017d). Macroeconomic stability represents the strength and degree of certainty of an economy to operate profitably (Shah, 2013b). Sensibly controlling inflation and exchange rate characterises economic stability. Low inflation and stable exchange rate in the host country create a favourable climate for drawing FDI (Shah, 2016c).

Theory suggests contrasting views of exchange rate-FDI relationship. Hence, in published research some studies shows a positive effect of exchange rate depreciation on FDI, whilst others predicts a negative sway. A positive effect is justified with the view that when exchange rate falls it means that the local currency depreciates per US dollar. A depreciation of local currency

may create profitable prospects for the international investors because the foreign currency strengthens and become more valuable, so there is an opportunity for the investors to purchase assets at a relatively reduced cost and spend less on a project in the host country than needed before. Another justification for lower exchange rate is that it reflects an improvement in competitiveness of exported goods (Hoang, 2012).

A negative impact of decrease in exchange rate is justified with a view that depreciation of host currency is associated with lower returns on investment in terms of the currency of home country as well as lower relative purchasing power of consumers in the host country (Razafimahefa & Hamori, 2005). If imported inputs are used in the production depreciation will deter FDI (Delice, 2003).

Dauti (2008) also argued mixed results of host country's exchange rate: in case of import substituting FDI higher host exchange rate may attract foreign investors to serve the country through domestic production units rather than exports. On the other hand, low exchange rate may have a negative impact on FDI inflows as it means depreciation of host currency this decreases the remittances and return on FDI and hence discourage FDI (Shah, 2011a). Against these arguments, it is often asserted that due to the depreciation of host currency not only the prices fall, but also the nominal returns on the assets in the host currency. Moreover, as the prices and returns on assets both go down, so the rise and fall in exchange rate should not affect FDI (Osinubi & Amaghionyeodiwe, 2009)

Price stability is another indicator of macroeconomic stability of a country. Due to increased growth in money supply, prices become unstable creating inflation in the economy (Shah, 2010). When host country's government fails to maintain a consistent -monetary policy and is unable to balance the budget, it leads to high inflation and internal economic instability (Schneider & Frey, 1985). In such a high inflation environment long-term investments by foreign investors are exposed to inordinate risks and increased uncertainty costs (Shah, 2011e). Investors investing in countries facing high inflation, usually require superior rates of return to compensate for the higher risks associated with high inflation in the country (Kang & Huang, 2012). These conditions can also hamper export sales from the host country, thus reducing inward FDI (Shah & Khan, 2016). Higher inflation is also an indicator of economic fragility of developing countries, and may deter FDI (Van Wyk & Lal, 2008). However, if the investment is done prior to the inflation period, then it is expected that increase in the prices of the products in which the

investors have invested, should have positive association with further inflows of horizontal FDI in a closed economy (Dauti, 2008).

High rate of inflation can trim down the returns on investment and have a negative effect on FDI inflows, as more time, energy, and money is spent to adjust to the growing price level, whereas low inflation indicates the commitment and credibility of the government (Shah, 2011d).

1.2 Research Question

The research question of the study is formulated as follows:

1. Does prudent economic management attract FDI inflows to the ASEAN member countries?

1.3 Objectives of the Study

This study is intended to:

- To examine whether judicious macroeconomic management influence the level of inward FDI into ASEAN.
- To evaluate whether current macroeconomic policies of ASEAN member countries are favourable for multinationals.
- To test whether any relationship exists between macroeconomic stability and FDI inflows to ASEAN member countries.

1.4 Structure of the Study

The research consists of six parts; Introduction, Literature Review, Methodology and model Specification, Estimation Techniques, Results and Discussion, and Conclusion. Part one introduces the background and objectives of this study, and research questions. Part two, review of literature. Part three constructs a model involving all the variables and explains them. Part four presents the estimation techniques employed to analyse the data. In part five results are presented and discussed. The last part six draws conclusion based on the results.

2. Literature Review

Delice (2003) examined the determinants of German FDI in Turkey for 1980 to 2001. Among all the variables bilateral trade, service sector effectiveness and labour productivity significantly attracts FDI, while high inflation rate deters inward FDI. Exchange rate volatility, market size and market growth proved to be insignificant. Nonnenberg and Mendonca (2004) explored the factors that influence FDI inflows in a sample of 33 countries from 1975 to 2000. An OLS (pooled) and a random effect panel model are used for estimation. The analysis shows

that market size, last year growth, schooling and openness are the major factors that attract FDI. Risk rating also proved to be a crucial factor in determining FDI. The study also proposes that inflation rate which is used as a proxy for macroeconomic stability, have a negative significant impact on FDI inflows.

Hong and Hsieh (2005) evaluated the determinants of FDI in four Southeast Asian transition economies: Cambodia, Laos, Myanmar and Vietnam using a dynamic panel data model with fixed effects for the period of 1990-2001. The determinants were grouped into three categories: macroeconomic factors which include GDP per capita, real GDP growth rate and openness, cost related factors which include real exchange rate and real wage rate, and investment environment improving factors which include human capital and government budget balance. The results suggest that one period lagged FDI inflows measuring agglomeration; GDP per capita and degree of openness are important factors to increase FDI inflows. The 1997 Asian Financial crises has a negative significant impact on FDI inflows, while cost related factors (real exchange rate, real wage rate) and investment environment improving factors (human capital, government budget balance) proved to be insignificant in determining FDI to the region. Razafimahefa and Hamori (2005) analysed the determinants of FDI in Sub-Saharan African countries using data from 1980 to 2001. The paper identified total factor productivity and exchange rate policy to be the key factors that significantly enhance FDI inflows. High inflation, measured by CPI and high CPI volatility in the domestic market are considered as signs of shaky macroeconomic conditions and significantly decrease FDI. Capital returns measured by inverse of GDP and market size showed positive significant results, while trade showed low significance. Tsen (2005) investigated the long-run association between inward FDI and location-related factors in Malaysian manufacturing industry using Hansen and Phillips (1990), fully-modifies least squares (FMLS) for 1980-2002. The results suggest that an improvement in education, infrastructure, market size and current account balance stimulates inward FDI, while a rise in inflation or exchange rate deters FDI to Malaysia.

Xing and Wan (2006) studied the impact of exchange rate on relative FDI inflows between the two recipient countries using both fixed and random effect models, for 1981 to 2003. Analysing Japanese FDI in China and ASEAN-4, they concluded that besides the market size, market growth rate and openness are important factors in attracting FDI inflows but the relative devaluation of Chinese Yuan against currencies of ASEAN-4 has also significantly influenced

the Japanese FDI distribution between China and ASEAN-4. The results also suggest that the FDI and exchange rate relationship is multi-dimensional i-e the exchange rate policy of one FDI recipient country influence both its own FDI and FDI inflows of other recipients.

Mahpar (2008) considered the relationship between exchange rate and FDI inflows from North East Asian countries over the pegging period of 1998-2005. Using multiple regression analysis (MRA) method for 1995-2005, the results suggest that currency devaluation has no significant impact on FDI inflows hence there is no significant relationship between Malaysian fixed exchange rate regimes and FDI flows from Northeast Asian countries. However, lower labour cost, interest rate and GDP growth proved to be significant factors in determining FDI inflows to Malaysia. No, Muhammad, Tamwesigire and Mugisha (2008) investigated the factors effecting FDI inflows in Rwanda using data from 1971-2003. The results specify that economic growth, trade openness and exchange rate depreciation positively and significantly influence FDI in Rwanda; however inflation does not have significant effect on inward FDI. Seikveng (2008) evaluated the determinants of FDI into ASEAN countries using OLS estimation technique for 1991-2007. The findings illustrate that GDP per capita; international trade and exchange rate depreciation significantly enhance FDI inflows. While inflation rate significantly reduce FDI inflows. The results suggest that any depreciation of local currency against US dollar promote the ASEAN countries competitiveness for FDI inflows and rise in inflation ensues economic ambiguity that lessen FDI, as investors identify greater uncertainty as an increased possibility of investment losses. Corruption also proved to be an essential factor in determining FDI inflows. Udoh and Egwaikhide (2008) examined the impact of volatility in exchange rate and inflation uncertainty on FDI inflows in Nigeria using GARCH model on data from 1970 to 2005. The results show that exchange rate volatility and inflation have significant negative impact on FDI. The results also indicate that infrastructural development, appropriate government size and international competitiveness are vital factors that determine FDI to Nigeria. Van Wyk and Lal (2008) explored the impact of institutional and macroeconomic variables on FDI inflows for 31 developing countries using a pooled least square technique and cross-country time series data from 1995-2003. The findings underline that the institutional variable; level of economic freedom encourage FDI inflows, while political risk discourages it. The macroeconomic variables; market size, growth, lower current account deficit, appreciation of host country's currency and lower inflation rate encourage inward FDI. The results suggest that depreciation of

the exchange rate reduces FDI inflows, as it is caused by higher inflation rates. As both of them symbolises economic disorder and thus, discourage FDI inflows.

Osinubi and Amaghionyeodiwe (2009) studied the impact of exchange rate volatility on FDI inflows in Nigeria using error correction model and OLS technique, on time series data from 1970-2004. The findings show that exchange rate volatility has no significant impact on FDI inflows, while exchange rate showed positive and significant effect suggesting that depreciation of Naira promote FDI inflows to Nigeria. The analysis also included structural adjustment program that proved to have negative impact on FDI inflows, and this result is attributed to the deregulation that was accompanied by exchange rate volatility.

Azam (2010) analysed economic determinants of FDI inflows in Armenia, Kyrgyz Republic and Turkmenistan using OLS technique for 1991-2009. The paper identified market size and official development assistance as significant factors in attracting FDI inflows. The results showed that inflation has negative significant impact on FDI however its results were insignificant in case of Kyrgyz Republic. Also official development assistance was insignificant in case of Armenia. Parajuli and Kennedy (2010) investigated the relationship between exchange rate and FDI inflows in Mexico from 25 OECD countries using both fixed and random effect models for 1995-2007. The results of exchange rate and GDP are negative and insignificant. Inflation rate showed positive and insignificant result. Wages, exports and distance also showed significant results. Shahrudin, Yusof and Satar (2010) explore the determinants of FDI inflows in Malaysia for the period of 1970-2008. The linkage between FDI and its key determinants is analysed by using an autoregressive distributed lag (ARDL) technique. The outcomes suggest that money supply which is used as a proxy for financial development; GDP and GDP growth rate are the major factors in determining FDI inflows to Malaysia. Exchange rate, inflation rate, corporate tax, openness and infrastructure also showed significant results.

Du (2011) analysed the key variables that attract FDI to Vietnam for the period of 1986-2009 using OLS technique. The results propose market size, market growth, infrastructure, imports and exports (openness), and exchange rate as significant factors in attracting FDI to Vietnam. Political risk and inflation rate also exhibit significant results showing that an increase in political risk and inflation rate discourage FDI inflows. Low labour costs were also insignificant the reason may be that efficiency seeking investors are interested in input to output ratios. Omankhanlen (2011) scrutinised the effect of exchange rate and inflation on FDI and the

bidirectional linkage between FDI and economic growth in Nigeria using OLS regression technique and time series data from 1980 to 2009. Two models were constructed; one to analyse the effect of exchange rate and inflation on FDI, and the other to analyse the relationship between FDI and economic growth. The outcomes suggest that FDI has no considerable role in enhancing economic growth in Nigeria, as its results were positive but insignificant. Inflation showed a negative insignificant effect on inward FDI, whereas, exchange rate proved to be a positive significant factor in attracting FDI inflows.

Hoang (2012) studied the determinants of FDI inflows in six ASEAN countries: Vietnam, Indonesia, Malaysia, Philippines, Singapore and Thailand using a panel random effect model for the period of 1991 to 2009. He concluded that market size, openness, quality infrastructure, exchange rate, interest rate and political stability significantly affect FDI inflows to the six ASEAN countries. Inflation rate has negative and financial development positive insignificant effect on FDI. The study also found that nominal labour cost, human capital, and labour productivity are significant factors attracting FDI into the region. Kang and Huang (2012) studied the determining factors of FDI to Brazil for 1970-2010. The variables that were investigated are market size, trade openness, inflation rates, and two dummy variables, namely the Bolivia-Brazil Pipeline and Sao Paulo Metro Line 5. Market size openness and the Bolivia-Brazil Pipeline showed positive and significant results. Inflation rate showed negative and significant results. While the results of trade openness and the Sao Paulo Metro Line 5 was not significant. Kurihara (2012) studied the key elements that determine FDI inflows into ASEAN countries from US for 2002-2012. Using an OLS estimation method he finds that domestic (ASEAN) economic growth and prices facilitate FDI into ASEAN. Also according to results there is no linkage between FDI volatility and domestic GDP and FDI volatility and US prices. The results also propose that rise in domestic prices (inflation in ASEAN) increase FDI volatility showing that FDI becomes unsteady along with the increase in inflation. The result of interest rate is also positive and significant showing that an increase in interest rate increases FDI. Shah (2013b) analysing the effect of macroeconomic stability on inward FDI in ninety developing countries for annual data on twenty eight years found prudent macroeconomic management as an essential determinant of FDI. The effect of both exchange rate and inflation was highly significant. Similarly, Shah (2016c) evaluating the judicious use of economic, monetary and

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fiscal indicators to be significantly influencing the multinationals investment choice in forty three African Developing Nations.

Summarising from the findings of the earlier work done on the same topic assuming a positive influence of sensible running of the macroeconomic mechanism shall enhance the FDI potential of the ASEAN member nations.

3. Methodology and Model Specification

3.1 Type of Research:

The research is empirical because different statistical techniques are applied to check the significance of the relationship among the variables. This study involves analysing the data, so a quantitative research method is more appropriate for it and is aptly utilised.

3.2 Population:

The population for this research is comprised of the total 10 ASEAN member countries.

3.3 Sample:

A sample of 9 ASEAN countries is selected from chosen population for the period of 1991 to 2010. This sample includes Brunei, Cambodia, Indonesia, Lao, Malaysia, Philippines, Singapore, Thailand and Vietnam based essentially on data availability.

3.4 Hypothesis:

Regression analysis is a study of association between variables. Hence, this research will examine the relationships stated in the hypotheses given below.

H_0: Prudent macroeconomic management has no effect on inward FDI to ASEAN countries.
H_1: Prudent macroeconomic management significantly influences inward FDI to ASEAN countries.

3.5 Sources of Data:

The data sources, the variable and proxies used as well as their expected effect is summarised in table one.

Table 1: Variables, Their Proxies, Data Sources and Expected

Variable Name	Proxy	Data Sources	Expected Signs
FDI	FDI Stock	UNCTAD FDI Statistics	
Market size	Population	World Development Indicators (World Bank)	+
Economic Development	GDP per capita	World Development Indicators (World Bank)	+
Openness	Trade (Imports + Exports)	World Development Indicators (World Bank)	+

Human Capital	Primary, Secondary and Tertiary Enrolment Ratios	Barro & Lee (2013)	+
Prudent Macro Economic Management	Inflation	Word Economic Outlook Databases (IMF)	-
	Exchange rate	International Financial Statistics (IFS) IMF	+

3.6 The Model:

The short form of a linear relationship quantifying the prudent macroeconomic management and foreign direct investment inflows in ASEAN member countries is as follows:

$$FDI_{jt} = f \left\{ \begin{matrix} Market\ size, Economic\ Development, Openness, \\ Human\ capital, Prudent\ Macroeconomic\ Management \end{matrix} \right\}_{jt} \quad \dots 1$$

As all the variables are in different units, such as million dollars, percentage etc., therefore we apply natural logarithm to convert them into a comparable form. Log linearizing equation (1) and putting appropriate dummies for the control variables give:

$$FDI_{jt} = \begin{matrix} \alpha_0 + \beta_1 lnPop_{jt} + \beta_2 lnGDPPC_{jt} + \beta_3 lnTrd_{jt} + \beta_4 lnPriEdu_{jt} + \\ \beta_5 lnInf_{jt} + \beta_6 lnExRate_{jt} + \mu_t + \varepsilon_{jt} \end{matrix} \quad \dots\dots\dots 2$$

Where j = 1,.... 9 representing the number of countries and,
t = Time period from 1991 to 2010.
Ln = Natural logarithm
FDI = Foreign Direct Investment stock.
Pop= Population representing market size of the host country.
GDPPC = per capita GDP representing the level of economic development.
Trd= Trade (imports + exports) representing openness of the host country market to the international trade.
Pri Edu = Primary enrolment ratios representing the level of human capital.
Inf = inflation representing macroeconomic stability.
Ex Rate = Exchange rate representing macroeconomic stability
α_0 = constant.
Where $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the coefficients for the parameters to be estimated.
The expected signs of the parameters are: $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0, \beta_5 < 0, \beta_6 > 0$

3.7 Dependent Variable:

Foreign direct investment (FDI) stocks in ASEAN member countries is the dependent variable and is measured by annual inward FDI stock in millions of Dollars. Data on this variable is collected from UNCTAD statistics.

3.8 Independent Variables:

Population, GDP per capita, imports, exports, primary, secondary and tertiary enrolment ratios exchange rate and inflation are the explanatory variables. The data on population, GDP per

capita, imports and exports is obtained from Word development indicators (WDI) of World Bank. Primary secondary and tertiary enrolment ratios are obtained from Barro & Lee (2013) educational data set. Data on inflation is obtained from World Economic Outlook Databases (WEO) of the IMF statistics and data on exchange rate is obtained from international financial statistics (IFS) of IMF statistics.

3.8.1   Market Size

Market size reflects the potential demand and the extent of consumption of the host country, and is a crucial factor in attracting foreign investors, as they can utilize their resources efficiently and can take advantage of greater sales in the host country (Shah & Tahir, 2017). To represent market size we use population (Pop) of the host country as proxy. Greater population size of the host country reflects a greater demand for the products of foreign investors (Shah, 2015). A positive relationship between population and FDI inflows is expected.

3.8.2   Level of Economic Development

The level of economic development reflects the economic conditions of the host country (Shah, 2009). Good economic conditions of the host country attract overseas investors to invest. GDP per capita (GDPPC) is used as a proxy for economic development. Higher income level of the host country is a vital factor for catching the attention of foreign investors (Shah & Qayyum, 2015). Thus GDP per capita is expected to have a positive impact on FDI inflows.

3.8.3   Openness

Openness of the host country reflects the link and the level of economic integration that a country have with the world (Shah, 2011b; Hoang, 2012). Openness implies removing trade barriers or making trade policies more liberal and to facilitate freer trade (Shah & Samdani, 2015). Liberal market is a driving motive for the multinational firms to invest in a country (Shah & Khan, 2016). In this study we use trade (Trd) as a proxy for openness. It is calculated by adding imports and exports. This variable is expected to have a positive impact on FDI.

3.8.4   Human Capital

Human capital both in terms of quality and quantity is another key factor that attracts efficiency seeking and export oriented FDI (Shah & Faiz, 2015). It is a crucial factor apropos location strategies of international firms. Host country human resource is considered very important by foreign investors for making long term investment (Shah, 2017b). Skilful, educated and efficient workers have greater labour productivity, as they can handle the new technology

and machines more efficiently and are important for attracting FDI inflows (Shah, 2014a). We use enrolment ratios at primary secondary and tertiary levels (PriEdu, SecEdu, TerEdu) as proxies for human capital. This variable is expected to have positive impact on FDI inflows.

3.8.5 Prudent Macroeconomic Management

Prudent macroeconomic management is evident from the strength and degree of certainty of an economy to operate profitably. Low inflation and stable exchange rate are the signs of macroeconomic stability.

Lower exchange rate means the depreciation of local currency per US dollar and may encourage FDI inflows (Shah & Ali, 2016). A depreciation of local currency may create profitable opportunities for the international investors as home currency weakens and become less valuable, so they may purchase assets at a relatively reduced cost (Shah, 2014b). The value of host country's currency per US dollar is used to measure the exchange rate (Ex rate). Depreciation of local currency per US dollar is expected to have positive impact on FDI inflows.

Price stability is another indicator of the stability of macroeconomic environment of a country. Stable prices in the host market promote capital inflows Shah, 2016b. Inflation reflects the uncertainty of investment environment and acts as a disincentive for FDI (Shah, 2017a). High inflation in the host country can reduce the return on investment and have a negative effect on inward FDI, as more time, energy, and money is spent in this environment to adjust to the increasing price level (Shah & Afridi, 2015). The annual average consumer prices are used to measure inflation (Inf). High inflation rate is expected to have a negative impact on FDI.

4. Estimation Techniques

A panel data of the nine ASEAN countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Vietnam, Thailand for the period 1991-2010 was used to carry out the study. The number of observation is 180. Stata 11 statistical software is employed to analyse the data. Generally, the panel data may have group effects, time effects, or both. These effects can be random or fixed effects. A random effect model (REM) is employed after Hausman (1978) specification test with a probability value of 0.4627, to analyse the data and interpreting the estimators because it is more efficient.

Before carrying the regression analysis, we are supposed to test the validity of available data. A panel data may have the problems of Multicollinearity and Heteroscedasticity that may lead to the chances of drawing incorrect conclusion about the beta values of the explanatory variables

coefficient. In order to prevent this problem, we check for the possibility of multicollinearity and heteroscedasticity. If there are no problems in these two mentioned tests, we will run simple regression on the data to obtain the estimated coefficients of population, GDPPC, Trade, Primary, Secondary and Tertiary enrolment ratios, as well as exchange rate and inflation.

4.1 Summary Statistics

The descriptive or summary statistics are given in table 2. The number of observations, mean, median variance, standard deviation, minimum and maximum values of all the variables are included.

Table 2: Descriptive Statistics

Variables	No. of Obs	Mean	Median	Variance	Skewness	Std Dev	Min	Max
Ln FDI stk	180	22.997	23.437	4.448	-0.905	2.109	16.783	26.876
Ln Pop	180	16.683	16.980	3.588	-0.730	1.894	12.466	19.296
Ln GDPPC	180	7.813	7.693	2.118	0.266	1.455	4.963	10.624
Ln Trade	180	24.119	25.155	10.425	-4.707	3.229	0.000	27.436
Ln Pri Edu	180	3.168	3.079	0.169	0.292	0.411	2.230	3.955
Ln Sec Edu	180	2.583	2.683	0.373	-0.319	0.611	1.092	3.661
Ln Ter Edu	180	1.079	1.154	1.282	-0.214	1.132	-1.204	3.131
Ln Inf	180	1.638	1.523	7.673	6.365	2.770	-4.092	24.974
Ln Ex rate	180	4.607	3.717	13.254	0.131	3.641	0.000	9.795

4.2 Test of Heteroscedasticity:

According to the assumption of linear regression analysis the error term has a normal distribution with zero mean and constant variance. But when the variance of error term is not constant, heteroscedasticity arises.

To detect heteroscedasticity we use Breusch- Pagan/ Cook-Weisberg test. It tests the null hypothesis that the error term has constant variance against the alternative hypothesis that the variance of error term is a multiplicative function of one or more variables that is the variance increases as the number of observations increases and vice versa. The greater the observation for each variable, the greater is the variance of error term. A large and significant chi-square value means Heteroscedasticity is present. The Breusch-Pagan test results are shown in table 3.

Table 3: Breusch-Pagan/ Cook-Weisberg Test Results

chi-square	22.64	Chi-square > prob	0.0000

The result shows that the value of chi-square is large and Probability value (0.0000) is significant so heteroscedasticity is present. To deal with this problem we will use the robust

standard error in regression analysis to control for heteroscedasticity. By using the robust standard errors the coefficient estimates are not changed, but standard errors and t values are changed, thus the t-statistics provide accurate p-values.

4.3 Test of Multicollinearity:

Multicollinearity refers to a perfect or exact linear association or high correlation between the independent variables in a regression. According to the assumption of the linear regression analysis, there shouldn't be perfect or exact association among the independent variables. When this assumption is violated in a regression, the problem of multicollinearity arises, where multicollinearity (high correlation) affects the robustness of the results (Shah & Jamil, 2016).

Multicollinearity may raise the standard errors of the coefficients, where increased standard error implies that coefficients of some exploratory variables are not significantly different from 0. Thus, it reduces the significance of the coefficient of an independent variable, while the coefficient should have been significant but observer may not detect it due to extreme multicollinearity.

4.3.1   Variance Inflation Factor

To measure the severity of multicollinearity we use the variance inflation factor (VIF) and tolerance (1/VIF). If there is no correlation between two independent variables, then all the VIFs will be 1. The general rule for estimating the degree of multicollinearity for VIF and tolerance level is subject to greater than 10 and less than 0.1 (Shah & Khan, 2017). If VIF for any one of the variables is greater than10 or tolerance (1/VIF) is less than 0.1, then multicollinearity is a problem. The VIF results are shown in the table 4. The results indicate that there is no serious problem of multicollinearity, as no VIF value is greater than10. The tolerance (1/ VIF) values for all the variables are greater than 0.1.

Table 4: VIF Results

VARIABLES	VIF	1/VIF
LnPop	3.77	0.265127
LnGDPPC	5.98	0.167351
Ln Trd	1.69	0.593269
LnPri edu	3.46	0.288835
LnSec edu	2.92	0.342832
LnTer edu	2.35	0.425255
Lninf	1.21	0.826625
LnEx rate	5.56	0.179979
Mean VIF	**3.37**	

4.3.2 Correlation

The correlation matrix is shown in table 5. Correlation is used to measure the degree of linear association between variables. The correlation coefficient can range from -1 to +1, whereas +1 shows a perfect positive correlation, -1 show a thorough negative correlation and 'o' means no correlation. The correlation between a variable and itself is always 1 as in the table 5 the correlation between LnFDI stk and LnFDI stk is 1. The correlation between population and GDPPC is negative, which means that when population increases GDPPC decreases. The correlation between population and trade is positive, which means that when population increases trade also increases. The correlation matrix shows there isn't awfully high correlation between any pair of explanatory variables.

Table 5: Correlation Matrix

	Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	LnFDI Stk	1.000								
2.	LnPop	0.389	1.000							
3.	LnGDPPC	0.352	-0.604	1.000						
4.	LnTrd	0.564	0.441	0.073	1.000					
5.	LnPri Edu	-0.198	0.299	-0.384	-0.088	1.000				
6.	LnSec Edu	0.539	-0.038	0.568	0.271	-0.577	1.000			
7.	LnTer Edu	0.451	-0.043	0.296	0.263	-0.674	0.470	1.000		
8.	LnInf	-0.206	0.181	-0.401	-0.067	0.208	-0.283	-0.189	1.000	
9.	LnEx rate	-0.326	0.469	-0.779	-0.138	0.699	-0.609	-0.615	0.358	1.000

The correlation between all the independent variables is less the bench mark of 90% (Shah & Khan, 2017). This adds further credence to the findings from VIF apropos the inexistence of problematic multicollinearity.

5. Results and Discussion

The results are given in table 6. In model one the coefficient of population (Pop) variable used as a proxy for market size is positive and proved to be significant at 1% showing a positive and significant relationship between FDI and population. This finding is similar to the results of Tsen (2005) and Shah (2017d). Thus the market size of the recipient country is a crucial factor that catches the attention of overseas investors. In model two the coefficient of GDP Per capita (GDPPC) used as a proxy for the level of economic development is also positive and significant at 1% representing a positive and significant relationship between it and FDI. This outcome is similar to the findings of Hong and Hsieh (2005), and Shah and Tahir (2017). This result implies that higher level of economic development or higher GDPPC contributes positively to surge in

inflows of FDI. In the third model the variable trade (Trd) used as a proxy for openness is positive, however insignificant. This finding is similar to the results of Khachoo and Khan (2012). This result implies that overseas investors do not place much importance in host country's openness while making the investment decision in ASEAN developing countries. This result may be because of the nature of FDI into developing countries, where it is mostly market seeking and the investors may want to serve the host country by setting up the subsidiaries in the local market (Khachoo & Khan, 2012). Whereas, foreign investors involved in export oriented FDI may prefer more open markets for their investments. So, it may be concluded that ASEAN countries attract market-oriented FDI and hence are least influenced by trade restrictions.

Primary and secondary enrolment ratios (Pri Edu, Sec Edu) used as a proxy for human capital showed insignificant results in model four and five. Only tertiary enrolment ratios (Ter Edu) proved to be positive and significant at 10%, which implies that there is positive and significant relationship between FDI and tertiary education. This result is in line with the findings of Nonnenberg and Mendonca (2004). This result suggests that FDI inflows in ASEAN countries are attracted by knowledge-intensive activities.

In model seven, inflation (INF) used as a proxy for macroeconomic stability showed negative but insignificant results, which suggest that this variable have little influence on FDI. This result is consistent with the findings of No et al (2008) and Hoang (2012). This result may be because of fewer fluctuations in the prices during the analysed period.

In model eight and nine exchange rate (ExRate) representing macroeconomic stability showed positive results and proved to be significant at 10%, which implies that there is positive and significant relationship between FDI and exchange rate. This result is consistent with the findings of No et al. (2008), Seikveng (2008), Hoang (2012), Shah (2013b) and Shah (2016c). This outcome suggests that depreciation of the local currency per U.S dollar pull FDI inflows to ASEAN member countries.

The value of R^2, showing the overall significance of the model is 76% which means that the independent variable collectively explains 76% of the variations in FDI.

Table 6: Estimation Results with Random Effects

Variable Name / Regression Model	Proxy	1	2	3	4	5	6	7	8	9
Market Size	lnPop	3.2713*** (0.6936)	1.6250*** (0.2257)	1.3725*** (0.1811)	0.1860*** (1.4222)	1.2841*** (0.2784)	1.2696*** (0.1712)	1.2519*** (0.2596)	1.2281*** (0.2477)	0.9147*** (0.2445)
Development Level	lnGDDPC		1.6689*** (0.2188)	1.6656*** (0.2083)	0.2083*** (1.6930)	1.4682*** (0.3642)	1.3982*** (0.2038)	1.3012*** (0.3571)	1.4291*** (0.3725)	1.3169*** (0.4381)
Openness	LnTrade			-0.0224 (0.0215)	0.0196 (-0.0242)	-0.0258 (0.0201)	-0.0253 (0.0161)	-0.0297* (0.0143)	-0.0289* (0.0137)	0.0532 (0.0975)
Human Capital	Ln PriEdu				0.3831 (0.26554)			0.7761* (0.4860)	0.6591 (0.4772)	-0.1701 (1.0484)
	LnSecEdu					0.5736 (0.5523)		0.2050 (0.9467)	0.0557 (0.948)	0.0087 (0.6084)
	Ln TrEdu						0.6324* (0.2599)	0.7547* (0.3461)	0.8114* (0.3607)	0.5738 (0.3682)
Inflation	LnInf							-0.0103 (0.0225)		-0.0007 (0.0171)
Exchange Rate	LnExRate								0.0811* (0.0357)	0.1283* (0.0644)
No. of Observations		180	180	180	180	180	180	180	180	180
R- Squared		0.1516	0.6642	0.6878	0.6727	0.6913	0.7411	0.7301	0.7327	0.7604

***, **, * Shows significance at 1, 5 and 10 % respectively "results are after controlling for heteroscedasticity. Coefficients are given with standard errors in parenthesis

6. Conclusion

A panel random effect technique is used to analyse the impact of prudent macroeconomic management on FDI inflows to ASEAN member countries for the period of 1991-2010. Though, most of the findings are in conformity with theoretical juxtapositions and match the hypotheses, there are some results that are in contrast to our expectations.

The results indicate that market size and level of economic development have positive and significant effect on FDI inflows. The variable trade used as a proxy for openness showed negative and insignificant results. The negative and insignificant result of trade means that ASEAN countries attract market-oriented horizontal FDI and the investors may want to serve the host country by setting up the subsidiaries in the local market rather than exporting the product outside the host country and hence is least influenced by trade restrictions. Additionally, tertiary school enrolment also significantly attracts FDI inflows. However, primary and secondary school enrolment proved to be insignificant. The positive and significant result of tertiary school enrolment shows that foreign investors are interested in highly skilled workers.

Inflation showed negative but insignificant result. The negative and insignificant result of inflation may imply for less or no fluctuation in inflation rates in ASEAN member countries. The positive and significant result of exchange rate implies that a depreciation of local currency per U.S dollar may create profitable opportunities for the international investors as it reduces the cost of assets and thus stimulate FDI inflows.

The limitations of the study are acknowledged and it is expected that with the future availability of micro sectoral data, thorough insights may be added to the current pool of data dealing with the phenomenon explored in the current work.

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Appendix 1

Table 1: Selected Countries and their share of FDI inflows in the Total World FDI (%)

Region	1991	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Developed Countries	74.14	60.78	58.67	71.88	78.25	81.40	72.82	70.17	63.98	55.99	63.36	66.48	68.78	57.50	50.78	48.39
Developing Countries	25.62	37.83	39.22	26.97	20.97	18.20	26.02	28.04	32.52	39.86	33.49	29.78	26.91	35.58	42.94	46.12
ASEAN	8.77	7.81	7.07	3.16	2.66	1.69	2.45	2.76	4.39	4.97	4.13	3.87	3.52	2.67	3.58	6.09
China	2.81	9.85	9.30	6.42	3.72	2.92	5.67	8.41	9.47	8.28	7.34	4.98	3.98	6.12	8.35	8.5
Japan	0.82	0.06	0.67	0.45	1.17	0.59	0.75	1.48	1.13	1.07	0.28	-0.45	1.07	1.39	1.07	-0.15
World	158	389	485	707	1089	1401	825	628	567	732	986	1459	2100	1771	1114	1323

Source: UNCTAD FDI statistics. Note: World FDI inflows are given in billions of U.S