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HOST COUNTRY MACROECONOMIC DETERMINANTS IN THE CHOICE OF LOCATION BY THE WORLD LARGEST FDI EXPORTERS

Using the bilateral FDI stock data of 2001–2012 for the 5 largest FDI exporting economies (France, Germany, Japan, UK and USA) to 98 host countries, this study investigates the host country macroeconomic determinants of FDI. The key objective of this study is to examine whether there exists any sort of convergence/divergence among the largest FDI exporters on the determinants of FDI location choice. The variables examined include host country's GDP, openness to international trade, exchange rate and inflation. The results show variations across different source country regressions in terms of the nature and magnitude of the relationship between FDI and the explanatory variables examined.

Keywords: FDI; developing economies; developed economies; trade openness; macroeconomic determinants.

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МАКРОЕКОНОМІЧНІ ПОКАЗНИКИ КРАЇНИ-РЕЦИПІЄНТА ПРИ ВИБОРІ НАЙБІЛЬШИМИ СВІТОВИМИ ЕКСПОРТЕРАМИ ІНВЕСТИЦІЙ НАПРЯМКУ ДЛЯ ПІІ

У статті проаналізовано дані щодо ПІІ за 2001–2012 рр. для 5 світових лідерів з експорту інвестицій (Франція, Німеччина, Японія, Велика Британія та США), а також для 98 країн-реципієнтів, для подальшого визначення макроекономічних факторів впливу на тренди ПІІ. Виявлено спільні риси та відмінності в рішеннях щодо спрямування інвестицій найбільшими експортерами ПІІ. Центральні зміни дослідження – це ВВП країн-реципієнтів, відкритість міжнародної торгівлі, обмінний курс та інфляція. Регресійний аналіз виявив значне різноманіття взаємозв'язків між макроекономічними показниками країн та обсягами ПІІ в них.

Ключові слова: ПІІ; економіки, що розвиваються; розвинені економіки; відкритість торгівлі; макроекономічні показники.

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МАКРОЭКОНОМИЧЕСКИЕ ПОКАЗАТЕЛИ СТРАНЫ-РЕЦИПИЕНТА ПРИ ВЫБОРЕ НАИБОЛЬШИМИ МИРОВЫМИ ЭКСПОРТЕРАМИ ИНВЕСТИЦИЙ НАПРАВЛЕНИЯ ДЛЯ ПИИ

В статье проанализированы данные о ПИИ за 2001–2012 гг. для 5 мировых лидеров экспорта инвестиций (Франция, Германия, Япония, Великобритания и США), а также по 98 странами-реципиентам, для определения макроекономических факторов влияния на тренды в ПИИ. Выявлены сходства и отличия в решениях о направлении инвестиций крупнейшими экспортёрами ПИИ. Центральными переменными исследования являются ВВП страны-реципиента, открытость международной торговли, обменный курс и инфляция. Регрессионный анализ выявил значительное разнообразие во взаимосвязи между макроекономическими показателями стран и объёмами ПИИ в них.

Ключевые слова: ПИИ; развивающиеся экономики; развитые экономики; открытость торговли; макроекономические показатели.

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Introduction. Issues revolving around Foreign Direct Investment (FDI), its benefits to host countries and determinants have attracted considerable attention of researchers since the 1980s, thereby generating a huge amount of literature. Central to the proposition that FDI is beneficial to the host economy are technology and knowledge transfer potentials presumed to be associated with it (Blalock and Gertler, 2008; Blomstrom and Sjöholm, 1999; Borensztein, De Gregorio and Lee, 1998; Byun and Wang, 1995; Xu, 2000). On the contrary, a number of scholars consider FDI as detrimental to a host economy, or at least remain sceptical about it (Herzer et al., 2008). Equally, opinions are divided among scholars regarding the effects of various host country factors on FDI attractiveness of an economy.

In most of developing economies, periods between the early 1980s to the 1990s are generally characterised by significant liberalization of investment frameworks. Most economies offered subsidies, others aggressively offer tax incentives in the form of tax holidays and import duties exemption to multinationals, all aimed at attracting FDI (Carkovic and Levine, 2002). On the whole, such periods of increased efforts on attracting FDI among world economies coincided with an upsurge in the FDI flow across world economies. For instance, the global stock of outward FDI rose from 11,634 bln USD during the period 1981–1990 to 44,786 bln USD during 1991–2000 and further escalated to the striking level of 214,697 bln USD in 2001–2013 (UNCTAD, 2015). However, whereas there is a significant increase in FDI into most of the world economies in absolute terms, the distribution of FDI within the group of developing economies is highly uneven and skewed in favour of a limited number of economies (Noorbakhsh et al., 2001). For example, the UNCTAD data (2015) shows the average share of FDI inflows into developing Africa of the total flows to developing economies to be 10.63% for the period 1981–1990. This can be compared with a huge share of 59.02% belong to developing Asian economies and 29.62% for developing America over the same period. Furthermore, for the period of 1991–2000, developing African economies experienced further deterioration in their share of FDI to developing economies with only 5.81% as compared to 61.81% and 32.77% for developing Asia and America respectively.

The purpose of this study is to undertake a comparative analysis on host economies' macroeconomic determinants of FDI attractiveness on a large sample of 98 economies and 5 biggest FDI exporters (France, Germany, Japan, UK and USA). The paper contributes to the extant literature in two ways:

1. While a teeming majority of studies on the determinants of FDI lumped bilateral FDI data from different source economies to many host economies (developed and developing), others have examined the determinants of inflows into one economy, in most cases – the developed one. This study focuses on the world largest FDI exporters to a very large sample, comprising both developed and developing economies.

2. Our study employs more recent data and covers larger sample in terms of time frame and the number of host economies as compared to many other previous researches.

Methodology.

1. **Data.** Data on outward FDI (LRPFDI) stock by destination was acquired for 5 OECD source economies (France, Germany, Japan, UK and USA) for the period

2001–2012. The data covers the total of 98 host economies, both developed and the developing ones. The data was originally in current USD but converted into real per capita terms using Gross Domestic Product (GDP) deflator. Using stock data follows the footsteps of the previous studies such as (Kinoshita and Campos, 2003; Benassy-Quere et al., 2007; Kang and Jiang, 2012). The choice of stock data, as opposed to flows, was used due to the fact that stock data measures FDI location more accurately (Filippaios et al., 2003). We measure GDP (LRGDP) using constant 2005 USD. Real effective exchange rate is used as our exchange rate (LREXR) variable. Inflation is measured using Consumer Price Index (CPI) (LCPI) and trade openness (LOPEN) as the total trade share of GDP. With the exception of trade openness the data was obtained from the World Development Indicators (WDI) database, all other variables were obtained from the UNCTAD. All variables are in log form. We averaged the data over 3-year non-overlapping periods (2001–2003 and 2004–2006) in order to remove cyclical fluctuations in the data, thus arriving at 4 observations per economy.

2. Empirical model. Following the discussions, we set up the following regression model for estimation:

$$LRPFDI_{it}^j = \beta_0 + \beta_1 LRGDP_{it} + \beta_2 LOPEN_{it} + \beta_3 LREXR_{it} + \beta_4 LCPI_{it} + \varepsilon_{it}, \quad (1)$$

where $j = 1, 2, 3 \dots 5$ stands for a source country j ; $i = 1, 2, 3 \dots$ represents host country i ; $t = 1, 2, 3, 4$ indicates the time period.

The above regression model was estimated for each source country. We used pooled Ordinary Least Squares (OLS), one-way fixed effects, two-way fixed effects and random effects models in all the cases. In order to examine the sensitivity of our results to the sample selection, we estimated the model using data for the sub-samples of developed and developing host economies.

Empirical results. The necessary diagnostic tests required for analysing panel data were conducted and the results are reported in the lower part of Table 1. The tests include Hausman specification test, Wald Likelihood Ratio (LR) test and Breusch-Pagan Lagrange Multiplier (LM) test³.

Table 1 contains the estimation results for the empirical model using the full sample data, both developed and developing host economies, for each source country regression. We ran the total of 15 regressions – 3 of each for the 5 source countries. As Table 1 shows, the results of the statistically favoured models indicate that the sign of our parameter estimate for real GDP is positive in all the cases, hence confirming our expectation. However, the coefficient estimates for the variable are statistically different from 0 in 3 cases, namely; France, at the 1% level of significance, USA at the 1% level of significance and Japan at the 5% level. The results are in accordance with the prior expectation of a positive link between the market size of an economy and its FDI attractiveness to foreign investors.

Similarly, the results for the parameter estimate of trade openness (LOPEN) are positive in all the regressions of statistically preferred models with the exception of

³ Beneath Table 1, we state the purpose of each test and the decision rule applicable to the hypotheses associated with each. Hence, discussion on the results of the tests is considered needless at this point, at least for brevity. Furthermore, it is worth noting that our discussions of results for each source country regression are limited to the statistically favoured model based on the aforementioned tests.

Table 1. Regression results for the empirical model – full sample, authors'

	France	Germany	Japan	UK	USA
<i>OLS (without time and country dummies)</i>					
LRGDP	1.99*** (5.23)	0.88*** (2.80)	0.89** (2.04)	0.31 (0.51)	0.11 (0.40)
LOPEN	0.08 (0.24)	0.59** (2.51)	1.04*** (2.88)	0.26 (0.58)	0.51** (2.19)
LCPI	-0.38 (-1.15)	-0.37 (-1.50)	0.35 (0.76)	-0.41 (-0.67)	-0.02 (-0.11)
LREXR	-0.13 (-0.29)	0.64** (2.49)	0.71 (1.55)	-0.40 (-0.62)	-0.10 (-0.34)
Adj. R ²	0.128	0.179	0.322	0.096	0.071
<i>Two-way/One-way fixed effects</i>					
LRGDP	5.61*** (7.06)	1.00 (1.34)	2.63 (1.49)	1.08 (0.98)	2.16*** (3.09)
LOPEN	0.82 (1.61)	0.24 (0.80)	1.70** (2.25)	-0.08 (-0.10)	0.81** (2.17)
LCPI	-0.82 (-1.24)	0.19 (0.31)	-0.73 (-0.57)	-3.64* (-1.79)	0.53 (1.30)
LREXR	-0.02 (-0.04)	0.55* (1.88)	1.22 (1.59)	0.53 (0.58)	-0.61 (-1.56)
Adj. R ²	0.162	0.413	0.056	0.066	0.072
<i>Random effects</i>					
LRGDP	1.65*** (3.67)	0.45 (1.08)	0.56 (1.18)	0.24 (0.37)	-0.11 (-0.34)
LOPEN	-0.09 (-0.24)	0.29 (1.26)	0.81** (2.09)	0.17 (0.33)	0.41* (1.67)
LCPI	-0.60 (-1.64)	-0.56** (-1.96)	-0.17 (-0.31)	-0.58 (-0.79)	-0.11 (-0.52)
LREXR	-0.08 (-0.18)	0.60** (2.36)	0.60 (1.29)	-0.41 (-0.63)	-0.09 (-0.31)
Adj. R ²	0.041	0.042	0.044	0.034	0.051
<i>Diagnostic statistics</i>					
LR	7.35***	7.06***	8.63***	2.08	4.25**
HS	40.06***	8.80*	6.68	7.78*	15.99***
LM	0.00	3.06**	0.00	0.00	0.00
N	243	99	84	117	213

Notes: *t*-ratios are in parenthesis. One-way fixed effect is estimated in the cases where we fail to reject the null hypothesis regarding no time effect. Time and country effects are not reported.

***, ** and * indicate that the coefficient is statistically significant at 1%, 5% and 10% levels, respectively.

Wald Likelihood-Ratio (*LR*) test is used in deciding the appropriate model between the country fixed effects only and two-way – time and country – fixed effects. Failure to reject the null indicates the preference of one-way effect over two-way.

Hausman Specification (*HS*) test is for making choice between two-way fixed effect model and random effect, failure to reject the null indicates that the random effects model is preferred.

Breusch-Pagan Lagrange Multiplier (*LM*) test is for the choice between random effects model and pooled OLS model. Failure to reject the null shows the preference for pooled OLS over random effects. The test is only used for further decision where HS test rejects fixed effect model, otherwise not needed.

N is the number of observations in each source country regression.

UK. Of the 4 source country regressions where the parameter estimates for the openness variable follow our prior expectation of a positive sign, coefficient estimates are statistically different from 0 in 2 source economies: Japan at the 1% level of significance and the USA at the 5% level. Another variable of interest to the study is inflation. Low and stable inflation rate is an indication of monetary stability in a given economy and as a consequence it is hypothesised that the relationship between FDI and inflation is negative. Parameter estimates for inflation variable are positive in 3 out of 5 cases, namely: Germany, Japan and the USA. However, the estimates are not statistically significant in all 3 cases. This contrasts the results for France and the UK, with parameter estimates having the expected negative sign, although statistically different from 0 only in the case of UK. Interestingly, the magnitude of the relationship between inflation and FDI is higher in the countries we obtain the expected negative sign, the UK (-3.64) and France (-0.82). This can be compared with lower magnitude of parameter estimates for Germany (0.19), Japan (0.35) and the USA (0.53).

The results of the statistically favoured models in the relationship between real effective exchange rate and FDI stock using full sample data for the 5 source economies show that the relationship is not statistically significant in all the cases with the exception of Germany. The parameter estimate is not only statistically significant but positive, thus it is in accordance with our initial expectation (note that high real effective exchange rate connotes depreciation in a home country's currency).

The bottom lines of Table 2 demonstrate that our various diagnostics tests favoured pooled OLS for Germany, Japan and the UK; fixed effects for France; and random effects for the USA.

If to compare our full sample regression for France, where the only statistically significant parameter is trade openness, the results for the sample of developed economies show that beside exchange rate, all other variables are statistically significant and carry the expected signs. Similarly, for Germany, significant difference between our estimates for the full sample data and the sub-sample of developed economies can be obviously observed. While in the full sample regression the only statistically significant parameter is exchange rate, the selected model for the sample of developed economies indicate that both real GDP and CPI are significantly different from 0, though at the marginal level of 10%. Surprisingly, whereas we obtained the expected positive sign for the market size variable, reverse is the case for inflation, where the parameter estimate is found to be unusually positive.

Moreover, the regression results for Japan for the sample of developed economies show that parameter estimate for inflation is the only statistically significant relationship and also surprisingly positive. This, however, contradicts our estimates for Japan using the full sample data, where we observe that FDI is an increasing function of real GDP and trade openness. The regression based on the sample of developed economies for UK stands alone; with no significant parameter estimate in any case. Column 5 in Table 2 shows the results for the USA regression based on the sample of developed economies. As Table 2 shows, the only statistically significant variable is trade openness. The variable is positive and statistically significant at the 10% level of significance, indicating that relatively open developed economies are more attractive to FDI from the USA.

Table 2. Regression results for the empirical model – developed economies, authors'

	France	Germany	Japan	UK	USA
<i>OLS (without time and country dummies)</i>					
LRGDP	3.06*** (4.88)	1.55* (1.92)	-2.18 (-1.39)	0.26 (0.24)	0.46 (0.97)
LOPEN	1.15** (2.43)	-0.44 (-0.84)	1.74 (1.68)	-0.82 (-1.04)	0.66* (1.79)
LCPI	0.69 (1.06)	1.31* (1.80)	3.06** (2.24)	0.53 (0.49)	0.38 (0.83)
LREXR	-1.71*** (-3.38)	0.12 (0.31)	1.11 (1.13)	-0.86 (-0.92)	-0.21 (-0.55)
Adj. R ²	0.115	0.212	0.091	0.169	0.152
<i>Two-way/One-way fixed effects</i>					
LRGDP	3.72*** (5.97)	1.24 (1.13)	0.43 (0.13)	0.60 (0.43)	0.38 (0.70)
LOPEN	1.82*** (2.89)	-1.46 (-1.68)	2.21 (1.12)	0.89 (0.57)	0.48 (0.99)
LCPI	-3.44** (-2.04)	3.12 (1.33)	4.98 (0.73)	-2.20 (-0.42)	-0.08 (-0.06)
LREXR	0.16 (0.25)	-0.43 (-0.56)	2.44 (1.40)	0.45 (0.32)	-0.25 (-0.56)
Adj. R ²	0.121	0.209	0.099	0.121	0.131
<i>Random effects</i>					
LRGDP	3.26*** (5.34)	1.34 (1.52)	-2.22 (-1.39)	0.08 (0.07)	0.48 (1.01)
LOPEN	1.36*** (2.71)	-0.51 (-0.94)	1.62 (1.32)	-1.24 (-1.41)	0.67* (1.67)
LCPI	0.12 (0.11)	1.07 (1.29)	2.57 (0.87)	-1.15 (-0.61)	0.55 (0.76)
LREXR	-1.33** (-2.51)	0.17 (0.43)	1.05 (1.02)	-0.96 (-1.03)	-0.28 (-0.74)
Adj. R ²	0.118	0.226	0.109	0.130	0.133
<i>Diagnostic statistics</i>					
LR	1.94	1.96	2.99*	0.53	1.74
HS	19.28**	2.43	2.24	4.66	0.84
LM	2.12*	0.00	0.00	0.00	3.06**
N	102	39	42	75	78

Notes on Table 1 apply.

Table 3 contains the estimation results for our model for the sample of developing economies. As can be observed in it, to some extent, the results for the sample of developing economies are similar to those for the full sample. In France, for instance, parameter estimate for openness variable is statistically significant and have the expected positive sign for the full sample and the sample of developing economies. This is also the case with Germany where the parameter estimate for real exchange rate is positive and statistically significant in both samples – full sample and that of developing economies.

As for Japan regression, the statistically preferred model registered some slight difference for the sample of developing economies as compared to full sample esti-

mations. In addition to market size and trade openness that were observed to have positive statistically significant impact on FDI in our full sub-sample estimation, exchange rate is also observed to have positive and statistically significant effect on FDI in the sample of developing economies. The UK regression for the sample of developing economies also differs from the full sample estimations. While our full sample regression for the UK indicates that FDI is negatively affected by the rate of inflation in a host economy, there is no evidence that situation is the same for developing economies, although the parameter estimate for the variable has the same sign. Finally, the results for the USA in the sample of developing economies is similar to that of the full sample in respect of statistically significant variables and their signs. In specific terms, the variables are market size and trade openness.

Table 3. Regression results for the empirical model – developing economies, authors'

	France	Germany	Japan	UK	USA
<i>OLS (without time and country dummies)</i>					
LRGDP	1.80*** (3.93)	0.69** (2.25)	1.37*** (3.48)	0.39 (0.49)	0.07 (0.19)
LOPEN	-0.50 (-1.14)	0.66*** (2.75)	0.74** (2.14)	0.75 (1.24)	0.42 (1.37)
LCPI	-0.72* (-1.77)	-0.47* (-1.97)	-0.29 (-0.68)	-0.69 (-0.81)	-0.02 (-0.08)
LREXR	0.55 (0.93)	0.72** (2.35)	0.83* (1.75)	0.04 (0.04)	-0.17 (-0.40)
Adj. R^2	0.191	0.231	0.211	0.091	0.031
<i>Two-way/One-way fixed effects</i>					
LRGDP	5.80*** (5.16)	0.22 (0.28)	5.06** (2.45)	2.45 (1.11)	2.50*** (2.68)
LOPEN	0.42 (0.61)	0.08 (0.26)	1.31* (1.77)	-0.24 (-0.26)	0.87* (1.79)
LCPI	-0.52 (-0.65)	-0.14 (-0.25)	-0.13 (-0.11)	0.94 (0.74)	0.63 (1.27)
LREXR	-0.05 (-0.06)	0.37 (1.21)	0.84 (1.14)	0.94 (0.74)	-0.80 (-1.42)
Adj. R^2	0.103	0.204	0.198	0.103	0.051
<i>Random effects</i>					
LRGDP	1.93*** (3.00)	0.50 (0.95)	1.38** (2.11)	0.90 (0.77)	-0.26 (-0.52)
LOPEN	-0.46 (-1.01)	0.31 (1.40)	0.74** (2.06)	0.85 (1.29)	0.34 (1.08)
LCPI	-0.67 (-1.52)	-0.49 (-1.57)	-0.29 (-0.55)	-0.52 (-0.53)	-0.12 (-0.41)
LREXR	0.54 (0.90)	0.52* (1.79)	0.83* (1.72)	0.15 (0.15)	-0.14 (-0.33)
Adj. R^2	0.113	0.320	0.104	0.091	0.179
<i>Diagnostic statistics</i>					
LR	5.00***	4.56**	4.91**	2.05	3.32**
HS	18.23***	7.48	6.45	14.22***	14.25***
LM	0.00	8.03***	0.00	0.02	0.00
N	141	60	42	42	135

Notes on Table 1 apply.

Conclusion. This study observes that on the whole, market size is the most important determinant for outward FDI among the 5 world largest FDI exporters. Openness is the next most important variable in determining the choice of FDI location among the sampled source economies. This therefore implies that, given the benefits associated with FDI, countries should increase their degree of openness to trade and put in place proper policies towards achieving output growth in order to attract more FDI to further finance growth and development. On the other hand, exchange rate is found to have less impact on FDI attractiveness of host economies. This finding is similar in all the cases – full sample and two sub-samples of developed and developing host economies. Similarly, CPI as a measure of inflation is found to have less effect on FDI attractiveness of both developed and developing economies.

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