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### **ABSTRACT**

This paper examines the factors affecting bilateral FDI stocks from 14 high income countries to all OECD countries over the period 1995 -2012. We specifically emphasise the effect of bilateral exchange rate volatility along with membership of CU and the EU. Our empirical analysis applies the generalised method of moments (GMM) estimator to a gravity model of BFDI stocks. The findings imply that exchange rate volatility and EU membership are significant determinants of FDI even when we condition on the variables that follow from the application of the gravity model. This study also considers the extent to which the East Asia and the global financial markets crises and systemic banking crises have exerted an impact on BFDI. We note that a high degree of exchange rate volatility discourages BFDI, but that adopting the single currency has not promoted

## 1. Introduction

Foreign Direct Investment (FDI) has become a critical driver of the World Economy and in the last two decades there have been critical advances across the globe in the investment environment, triggered in part by the recognition of the important contribution that FDI can have on economic growth and development. However, more volatile environments probably reduce FDI, with unanticipated exchange rate movements being a clear barrier to such capital flows. In addition, it is recognised that financial and economic crises, such as the one that hit Asian financial markets in 1997 and more recently the global financial crisis of 2008 have had a significant impact on this especially in relation to bilateral FDI and other forms of international capital movements.

Global FDI flows have been large in the last decade, though the economic and financial crises ameliorated this effect (*UNCTAD, 2014*). There is general agreement about the push and pull factors that influence FDI, and they are summarised in the Gravity model (see Head and Mayer 2014). However, recent research by Kambayashi and Kiyota (2015) found that evidence over the fundamental drivers of FDI to be inconclusive, as many different factors may affect the decision to invest abroad, as the products might simply be exported. However, directing investment into overseas markets can be used to avoid direct and indirect barriers to trade such as tariffs, transport costs and exchange rate risk.

This article focuses on bilateral FDI from 14 high income OECD countries to the countries in the OECD over the period 1995-2012 using annual stock data. Our sample choice covers most market driven outward FDI decisions which will have common causes, and we exclude flows from emerging markets such as China as these are driven by other more strategic goals. We use a Gravity model to determine the key factors that drive FDI and we take into account other economic and institutional factors, such as exchange rate volatility and membership of trade arrangements that may affect the distribution of FDI stocks across the host countries<sup>1</sup>. We estimation a dynamic panel using systems-GMM as it not only exploits the time series variation in the data, but accountnBT/F4 12 Tf1 0 0 1 306.05 384.29 Tm0 g0 G{ )JTJETQ0





by further factors: political and economic stability, factor proportions, openness, product-market regulation and labour market arrangements. In terms of the macroeconomy or policy that is implemented at the level of an economy or economic block some factors already feature in the Gravity model such as the size of the market as measured by national income.

Here the focus is on those variables that are driven by policy or relate to the broader economic environment, and it is common to look at the openness of the economy as a core indicator of policy stance. Eaton and Tamura (1994) for both the U.S. and Japan explained bilateral trade and FDI flows in the context of a standard







suggest that these results are not greatly affected by the choice. As is common in the finance literature the volatility ( $\sigma_{it}^2$ ) conditioned on the regression errors ( $u_{it}$ ) is explained by a GARCH(1,1) process:

$$\sigma_{it}^2 = \omega + \alpha_1 u_{it-1}^2 + \beta_1 \sigma_{it-1}^2 \quad (1)$$

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Where  $y_{i,j,t}$  in logarithms is the stock measure of bilateral outflow from the home country ( $i$ ) to the host country ( $j$ ) in year  $t$ , with FDI in current dollars deflated using the home country's GDP deflator, its lagged value is indicated by the subscript  $t-1$ , and  $\alpha$  is the adjustment coefficient in the dynamic form of the gravity model.  $EXV_{i,j,t}$  is the measure of exchange rate volatility derived either from a GARCH or EWMA model as explained in Table (2).  $GDP_{i,t}$  is real GDP for the home country and  $GDP_{j,t}$  real GDP for the host country,  $EXP_{i,j,t}$  is bilateral exports from the home to host country.  $EcoFree_{i,t}$  is the free economic index for the home country and  $EcoFree_{j,t}$  for the host country and  $DIS_{i,j,t}$  is the log of geographic distance.  $ULC_{j,i,t}$  is labour costs in the host country relative to the home country. The dummy variables to capture these further factors are:  $Lang_{i,j}$  defined as the effect of a common official language,  $Land_{i,j}$  a common land border,  $CU_{i,j,t}$  the country specific impact of the introduction of the Euro and  $SYS_{j,t}$  represents systemic banking crisis as described in the previous section.  $EU_{ijt}$  is a dummy that is one when the host and the home countries are both in the EU. We also introduce financial crisis dummies that distinguish between the global crisis, and Asian crisis ( $FC_t$ ).

It has been common to explain bilateral FDI stocks without our dynamic extension which incorporates a lagged dependent variable. This is likely to have led to errors as FDI

add our exchange rate volatility, European Currency Union and Single Market variables to a traditional Gravity model<sup>13</sup> and this is presented in column (1), and then to that model are added the crises dummy variables, in column (2) for systemic banking crisis. In column (3, 4 and 5), the dummies for the Asian and global crisis are added, and lastly both crises (

from the model. The test is not linear as the long-run is based on a ratio of the linear regression coefficients.

Perhaps the more important finding in our result is that the Single Market has significantly increased FDI flows within the Market, but we find no evidence that it has attracted additional FDI from outside given the other factors driving flows. It is found that joint EU membership has a strong impact on FDI. The EU coefficient estimate is economically and statistically significant so the bilateral FDI stock between member states increases. In the long run membership of the Single Market raises FDI from other members by around 50 percent, with supply chains spreading across the market area. This integration is clearly reversible, albeit slowly when a country leaves the Single Market.

The results for the financial crises variables imply that the shock related to the crises has spread as a result of the negative coefficient, which means the risk that follows from a crisis reduces BFDI, albeit temporarily. The effect of financial crises for all the models is coherent as these coefficients are as expected negative and statistically significant. Specifically, the coefficients of the global crisis dummy variables were found highly significant, indicating the presence of an impact of the global financial crises on the bilateral FDI stocks in the selected panel. The results for the estimates of the crises dummy coefficients reveal a significant decrease in FDI during the Asian crisis of 1997, with a slightly more negative coefficient during systemic banking crises. While, it can be seen from Table (3), columns (3) and (6) that the impact of the Asian crisis dummy related to 1998 although still negative is not significant.

The results for the global financial crisis are in line with the UNCTAD (2009) report that states

transaction costs as a result of a what may be common cultural ties or values are reduced and this encourages BFDI. This confirms similar findings for the same language in Buch et al. (2003), Bergstrand and Egger (2007) and Görg and Wakelin (2002).

More particularly, the distance between home and host countries has a negative and significant impact on BFDI. The coefficient suggests that when the distance increases by 1%, the bilateral stock of FDI falls by about 0.32%-0.50%. This is also consistent with previous studies as evidenced by Buch et al. (2004, 2005). This suggests that companies are found to prefer investing in closer countries rather than those farther away, while the impact of a common border is negative but not significant in all specifications in Table (3). This fits with the trade literature where the coefficient is positive, because proximity reduces the need for FDI in horizontally integrated industries. These results suggest that sharing the same land border has little impact on the FDI stocks.

It appears that unit labour costs are not important as they are not significant for any

stocks, or whose investments are driven by factors not

countries because they form the majority of countries in an OECD sample. This is important because not all countries are of the same size geographically as well as in terms of GDP. The

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**Appendix *Countries included in the sample.***<sup>17</sup>

<u>Home countries</u> <u>(14)</u>	<u>Host Countries</u> <u>(31)</u>	<u>EU Countries +</u> <u>joining date</u>	Currency
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**Table (3)** Results for dynamic panel-data estimation using two-step SYS-GMM, for BFDI outflow.

Variables	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)
$\text{LnBFDI}_{i,j,t}$						



***Table (5)***