The Impact of Exchange Rate Variability on US Direct Investment

Holger Görg and Katharine Wakelin

Leverhulme Centre for Globalisation and Economic Policy
School of Economics
University of Nottingham
University Park
Nottingham
NG7 2RD
E-mail: holger.gorg@nottingham.ac.uk

Abstract

This paper examines the impact of the level of the exchange rate, volatility in the exchange rate and exchange rate expectations on outward US FDI in 12 developed countries and inward FDI to the US from those countries for the period from 1983 to 1995. In our empirical analysis we find no evidence for an effect of exchange rate variation on either US outward investment or inward investment in the US. This result is robust to the two measures of FDI used – financial flows from the parent and MNE sales abroad – the choice of either outward or inward FDI, and a number of different estimation procedures. As regards the level of the exchange rate we find a positive relationship between US outward investment and appreciation in the host country currency while there is a negative relationship between US inward investment and appreciation in the dollar.

1. Introduction

The impact of the exchange rate on foreign direct investment (FDI) has recently been in the news in the UK, as high-profile closures of foreign affiliates such as Motorola in Scotland have been blamed on the overvalued Pound. In addition, some commentators have suggested that if the UK stays out of the Euro, foreign investment will withdraw or not choose to locate in the UK because of the greater expected exchange rate volatility associated with non-Euro membership. Clearly businesses and politicians are using the threat of potential dis-investment by foreign companies as a tool for negotiations and political battle. The question remains unanswered, however, whether the withdrawal of FDI is a credible threat. What is the relationship between the exchange rate, in particular the volatility of the exchange rate, and foreign direct investment?

Most research in this area to-date has concentrated on two issues: can the level of the exchange rate influence multinational activity; and can volatility, or variation in the exchange rate, have any impact on the location and relocation decisions of multinationals?[1] Traditionally the level of the exchange rate was assumed to have no impact on FDI at all. In a world of perfect capital markets the source of financing of assets should not matter and, hence, the decision to locate abroad should not be influenced by the level of the exchange rate. More recently this approach has been challenged.

In a seminal paper Froot and Stein (1991) suggested that if there are imperfect capital markets the level of the exchange rate can influence FDI. Capital market imperfections mean that multinational enterprises (MNEs) attribute a lower cost to

internal financing than the price of capital they would have to pay using external financing sources. As a result, depreciation of the host country currency against the foreign currency increases the relative wealth of foreigners and therefore may increase the attractiveness of the host country for foreign direct investment. In another contribution, Blonigen (1997) suggested that exchange rates can affect acquisition FDI as this involves purchasing firm-specific assets in the foreign currency that can then generate returns in another currency by being transferred to domestic production (or production in a third country). Some confirmation was found for this hypothesis for Japanese acquisitions in the US. Both these theories suggest that depreciation in the host country currency can lead to increased acquisition of domestic assets by foreign firms, although for different reasons.

Campa (1993), however, puts forward a different argument for the relationship between the exchange rate level and FDI. In his model, the firm's decision whether or not to invest abroad depends on the expectations of future profitability. In such a case the higher the level of the exchange rate (measured in units of foreign currency per host currency) and the more it is rising the higher will be expectations of future profits from entering a foreign market. Therefore, Campa's model predicts that an appreciation of the host currency will increase FDI into the host country, *ceteris paribus*, which is contrary to the predictions of the previous models. His empirical results analysing the number of foreign entrants entering the US provide evidence to support his model.

The theoretical underpinning for the impact of volatility on FDI has also been recently developed. Early studies suggested that, as with portfolio capital, exchange rate risk

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[1] A related literature examines the impact of volatility on trade flows (Anderton and Skudelny, 2001; McKenzie, 1999) and the effect of exchange rates on domestic investment (Nucci and Pozzolo, 2001; Goldberg, 1993).

(assumed to increase with volatility) will reduce direct investment (Wilhborg, 1978). More recently, Cushman (1985) developed a profit maximising model in which a number of effects are accounted for: the direct effect of increased real exchange rate risk and the possible offsetting indirect effects of induced productivity or output price changes. His empirical results indicate that increases in risk raise direct investment, partly because under exchange rate uncertainty FDI is preferred to exports as a means of serving the foreign market. While Cushman's model assumes that investors are to some degree risk averse, Campa (1993) suggests that exchange rate volatility can also impact on the investment decisions of risk neutral firms. He hypothesises that as investors are concerned with future expected profits, firms will postpone their decision to enter (or exit) as the exchange rate becomes more volatile. Risk neutral firms will thus be deterred from entering foreign markets in the presence of high levels of exchange rate uncertainty. The theoretical result is confirmed empirically for inward investment to the US in the wholesale industries, particularly in cases where the sunk costs of entry are high.

The aim of this paper is to contribute another piece to the debate on the relationship between the level and the variability of exchange rates and FDI. Specifically, we aim to examine the impact of the level of the exchange rate, volatility in the exchange rate and exchange rate expectations on both outward US foreign investment in 12 developed countries and inward investment to the US from those countries for the period from 1983 to 1995.

The paper makes a number of contributions to the existing literature. First, other studies have considered either inward or outward FDI but not both. This is important, as if both inward and outward FDI are increasing (as they have been for the US) it may be difficult to obtain the same results for the impact of the exchange rate on both.

For instance, in a period of Dollar appreciation outward FDI may have increased, indicating that a depreciation of the host country currency does raise FDI, while inward FDI from the same country has also increased, contradicting the hypothesis. Second, rather than defining FDI just as a financial transfer from partner to affiliate we have also used sales by the MNE as an indicator of MNE activity. We expect these measures to behave quite differently *a priori*, as they measure different aspects of multinational behaviour. Third, we use data for a more recent period than other studies, thus updating previous results. Also, we broadened the number of countries included in the analysis to 12. This broader sample gives us coverage of a larger proportion of overall FDI especially given the US is both the largest overseas investor and the largest recipient of FDI.

The focus on the US may make the paper less relevant to the policy debate in the UK, although the US is the largest investor in the UK and that bilateral relationship is included in the model. Our discussion may still give valuable insights into the general nature of the relationship between the level and variability of the exchange rate and FDI which can inform the ongoing debate. The remainder of the paper is set out as follows. Section 2 gives a brief overview of the relevant empirical literature. Section 3 outlines our empirical model and gives some summary statistics. Section 4 presents the results while the last section contains some conclusions.

2. Existing Empirical Evidence

Empirical studies of the impact of the exchange rate on FDI have been undertaken on a number of different units of analysis – the individual firm decision, sector patterns of FDI and the pattern of FDI between countries. Almost all of them use either outward US FDI (Cushman, 1985; Barrell and Pain, 1996) or inward FDI from other

countries into the US (Cushman, 1988; Campa 1993; Froot and Stein 1991). The choice of the US is partly influenced by data availability, but the topic has also raised some political interest in the US with concern over rising levels of inward FDI coinciding with a depreciating Dollar.

Some studies have examined the impact of exchange rates on firm-level entry decisions. Blonigen (1997) looks at the role of the real exchange rate level in influencing Japanese acquisition in the US. He found a positive impact of the exchange rate on acquisition (i.e. an appreciation of the Yen relative to the Dollar raised Japanese FDI in the US) and that this effect was particularly large for manufacturing sectors with high R&D expenditure. He interpreted these results as supporting his theory concerning the importance of firm-specific advantages (assumed to be higher in R&D intensive industries) rather than Froot and Stein's (1991) hypothesis of imperfection information. The latter does not predict a particular sectoral pattern for the impact of the exchange rate.

Campa (1993) also examined the relationship between the level of the exchange rate and entry in his analysis of the number of foreign firm entries into the US for 61 wholesale industries over the period 1981 to 1987. He predicted that the higher the level of the Dollar, the higher would be FDI as the expectation of future profits is higher. His empirical work confirmed this positive relationship, which is in contrast to Froot and Stein (1991). Campa (1993) attributes this difference to the measure of FDI (value of FDI rather than the number of firms entering) and the choice of sector (total FDI rather than just wholesale).

Furthermore, Campa (1993) investigated the impact of exchange rate variability as well as the level on inward FDI. He found volatility to be negatively correlated with foreign entry into the wholesale industries in the US. By concentrating on wholesale

sectors he simplified the influence of the exchange rate as, unlike manufacturing, the firms will not be concerned with importing inputs or the destination of the final output.

Other contributions have also concentrated on exchange rate expectations and exchange rate risk (with the latter generally being defined as volatility). Cushman (1985) examined US outward FDI in five OECD countries for 1963 to 1978. He introduced a number of new measures for risk and expectations. Cushman found that expecting the host country's real exchange rate to appreciate led to a reduction in US direct investment. Barrell and Pain (1996) confirmed the finding concerning exchange rate expectations for US outward FDI, namely, that an expected appreciation of the host exchange rate led to a reduction in US FDI. This was also confirmed by a study of FDI into the US (Cushman, 1988) that found expected appreciation of the dollar reduced FDI from five host countries.

A more controversial result is that Cushman (1985) found risk (measured as the standard deviation in the change of the exchange rate) had a positive impact on FDI. He suggested this increased the attraction of FDI relative to exports. This result appears to be partly contradicted by Brainard (1993) who examined the impact of the level of the exchange rate on the ratio of US MNE sales abroad over a combination of US MNE sales abroad and US exports to the same location. This ratio decreased as the host country currency appreciated relative to the Dollar, indicating that increasing the level of the exchange rate (she did not investigate volatility) does *not* favour direct investment relative to exports.

To summarise, most of the results confirm that expecting an appreciation in the host exchange rate leads to a reduction in FDI i.e. it may temporarily delay it as assets and costs become more expensive in the foreign currency. However, the results for

exchange rate risk or volatility and the influence of the level of the exchange rate are not consistent. Some studies have found a rise in risk increases FDI, while others have noted a reduction associated with volatility. The level of the exchange has also been found to have different impacts on FDI. While appreciation of the host currency seems to encourage entry by foreign firms in the wholesale sector in the US (Campa, 1993), total foreign firm entry into the US seems to be discouraged (Blonigen, 1997; Froot and Stein, 1991).

3. Empirical Model

In order to analyse the effect of real exchange rate movements on both the outward and inward FDI relationship between the US and 12 partner countries we estimate the following empirical model using data for the period 1983 – 1995:

$$FDI_{jt} = b_0 + b_1 R_{jt} + b_2 s_{jt} + b_3 trend_{jt} + b_4 l_{jt} + b_5 k_{jt} + b_6 gdpp_{jt} +$$
$$+ b_7 gdpus_t + b_8 fc_{jt} + b_9 d_j + b_{10} lang_j + e_{jt} \tag{1}$$

where R, s and $trend$ are the bilateral exchange rate variables for partner country j with the US at time t and the control variables are defined in Table 1.[2]

[Table 1 here]

Different definitions of the dependent variable FDI_{jt} are used for the analyses of outward FDI from and inward FDI to the US. For the former the dependent variable is US FDI in partner country j at time t while for the latter it is inward FDI from partner country j in the US at time t. In both cases two measures of FDI are used as proxies for the dependent variable namely, sales by multinationals in the host country and the level of FDI flows.[3] Data for both measures are available from the US

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[2] Note that all variables are defined in logarithms.
[3] The latter measure appears to be similar to the definition used by Cushman (1985).

Department of Commerce and were converted into real 1987 prices using the appropriate GDP deflator.

Arguably, the level of MNE sales may be a more appropriate measure of MNE activity as FDI flows are strongly affected by the choice of the means of finance of foreign activity. If MNE activity were only financed from funds obtained in the host country, FDI flows would be zero even though MNE activity in the host country may be high. Nevertheless, FDI flows better reflect the financing of foreign affiliates from the parent companies (in the US case they also include reinvested earnings for both inward and outward FDI) than MNE sales. As FDI flows are a measure of capital flows, we would expect them to be more sensitive to the exchange rate than MNE sales. MNEs may choose their target sales levels for their affiliates first and then select whether to finance them from the home or host country depending on factors including the exchange rate.

The definitions of the exchange rate variables follow closely those used by Campa (1993). Accordingly, R is the level of the exchange rate, calculated as the log of the annual mean of the monthly exchange rates (host country currency per US dollar) in year t. Exchange rate volatility is measured by the standard deviation of the exchange rate s defined as the annual standard deviation of the log of the monthly changes in the exchange rate. The expectations or trend in the exchange rate (*trend*) is calculated under two different assumptions: (i) perfect forecast and (ii) static expectations. Under the first assumption *trend* is calculated as the annual mean of the monthly changes in the log of the exchange rate in year $t+1$ and $t+2$ while under static expectations it is defined similarly but using monthly data for t-1 and t-2. All exchange rate data are taken from http://pacific.commerce.ubc.ca/xr.

The inclusion of relative labour and capital costs and host country market size variables (*l*, *k*, *gdpp*, *gdpus*) is standard in the literature on estimating the determinants of FDI (for example, Culem, 1988, Barrell and Pain, 1996). The size of the home economy (*gdpus* for outward FDI, *gdpp* for inward FDI) is included in order to control for the supply of FDI, as in Blonigen (1997). The assumption is that growth in the home economy is likely to generate a greater supply of FDI. We also control for the effect of transportation costs on FDI by including a measure of freight costs between the US and the partner country (*fc*) in the equation. Trade costs may discourage exporting and thus lead multinationals to substitute foreign production for exports (Brainard, 1997; Markusen 1995). Distance (*d*) may have a negative effect as one may expect MNEs to locate in host countries close to the home country[4]. A common language dummy (*lang*) is also included in the model. Locating in an English speaking country considerably reduces transaction costs for US multinationals. Furthermore, English speaking countries are likely to have closer cultural ties with the US than other countries and, as Kumar (2000) argues, cultural proximity is likely to stimulate FDI.

Figures 1 and 2 provide an overview of total MNE activity between the US and all 12 sample countries over the period 1983 to 1995 (for a list of countries in the sample see Table 2).[5] The most striking feature to note is that for both MNE sales and FDI flows, the pattern of US outward and inward activity looks remarkably similar. Sales by multinationals increased considerably up to 1990, decreased afterwards but rose again dramatically from 1993 to the end of the sample in 1995, leading to a considerable overall increase in MNE sales, both outward and inward, over the period. By

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[4] Distance and transportation costs are not highly correlated for the sample countries (the correlation is 0.10) as many factors influence transportation costs – such as the intensity of trade – as well as distance.

contrast, both outward and inward FDI flows do not show such a clear pattern but fluctuated more heavily on an annual basis.

[Figures 1 and 2 here]

Table 2 presents data to chart the development of the bilateral exchange rates (in terms of host country currency per US dollar) for each country for the period analysed. Note that, with the exception of Canada, the US dollar depreciated against all host country currencies over the period 1983 to 1995. This shows that US inward FDI increased as the dollar depreciated against almost all partner country currencies which is in line with the arguments put forward by Froot and Stein (1991). However, outward FDI increased despite a real depreciation of the dollar; a finding which casts doubt on the prior that a real exchange rate depreciation of the dollar should negatively impact on US outward FDI. Further summary statistics on the variables included in equation (1) are presented in Table 3.

[Tables 2 and 3 here]

4. Econometric Results

The results of estimating equation (1) for the case of US outward FDI are reported in Tables 4 and 5 for MNE sales and FDI flows as dependent variable respectively. The model is estimated under different assumptions of the error term e_{jt}. First, we assume that the error term is white noise and estimate equation (1) using simple OLS; the results of this exercise are reported in columns (1) and (4) of Tables 4 and 5. Second,

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[5] The choice of countries in the sample was influenced by the availability of monthly exchange rate data for the period under consideration; all countries have US foreign affiliates.

we allow for the presence of a country-specific effect in the error term by employing fixed and random effects panel data techniques in columns (2), (3), (5) and (6).[6,7]

Furthermore, note that in columns (1) to (3) we report the results for the estimations defining *trend* under perfect foresight, whereas (4) to (6) are based on results using static expectations to calculate *trend*. The results, however, indicate that the definition of *trend* makes little difference to the results of the estimations.

Turning to the estimations using MNE sales as dependent variable, we find that the results on the market size and relative cost variables are broadly consistent with prior expectations and with the evidence found in other studies of the determinants of US FDI, such as Barrell and Pain (1996) and Wheeler and Mody (1992). Host country market size affects MNE sales positively while relative capital and labour costs have negative effects on sales by MNEs, although labour costs are only statistically significant in the OLS regressions. The size of the US economy, which is included to control for the supply of FDI is also consistently positive although it is only statistically significant in the OLS regressions. The coefficients on distance and language also turn out the expected signs (statistically significant) only in the OLS regressions, where distance has a negative and language a positive effect on US FDI.[8] The transportation costs variable is not significant.

The results on the exchange rate variables are not as straightforward, however. From the regressions there is no statistical evidence that volatility, measured either by the

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[6] Note that both panel techniques yield broadly similar results. A priori we would tend to prefer the random effects technique for two reasons. First, we do not have a fixed set of countries due to missing observations. Second, Hausman tests suggest that the random effects model is preferable to fixed effects estimation in all cases (although of course our sample size is very small for a meaningful application of the Hausman specification test).

[7] We also re-estimated all models including time dummies to control for the possible influence of time-varying effects not captured in equation (1). Results, which are not reported here but can be obtained from the authors upon request, are broadly similar to the results reported.

8 Note that the distance and language variables are dropped in the fixed effects estimations as they are time invariant.

standard deviation of the changes or the trend of the exchange rate, has any effect on US outward FDI. The level of the exchange rate, however, has a consistently negative coefficient, implying that the level of US FDI increases with an appreciation of the host country exchange rate (i.e. a reduction in the exchange rate) as we expected from the summary statistics.

[Table 4 here]

These results are broadly similar when using US outward FDI flows as the dependent variable. As the results in Table 4 show, using FDI flows instead of MNE sales leads to lower fits of the overall regressions and also reduces the statistical significance level on some of the variables. This supports the idea that FDI flows may be poor proxies for the activities of MNEs. Nevertheless, we expected the exchange rate to potentially affect FDI flows more than MNE sales. This expectation has not been confirmed: volatility also appears to play no role in influencing financial flows from the parent to the affiliate.

[Table 5 here]

The result of a negative relationship between the host country exchange rate and US outward FDI is at odds with some of the previous empirical evidence found by, for example Cushman (1985).[9] As pointed out above, inspection of the raw exchange rate data shows that, with the exception of Canada, the US dollar has tended to depreciate against all host currencies while US outward FDI (most notably in terms of MNE sales) has been increasing over the period analysed in this paper. This indicates that US outward FDI is not negatively affected by an appreciation of the host country exchange rate against the dollar but that it has increased along with exchange rate

appreciations in the host countries. This suggests that earlier results may rely on the period they cover.[10] US MNE activity has been constantly rising since the post-war period, in some periods this may coincide with appreciation of the Dollar relative to host country currencies, while for other periods it coincides with depreciation of the same bilateral rates.

To check the reliability of the results for outward FDI we also estimated equation (1) using inward FDI in the US from the sample countries as dependent variable. Over the same period *inward* FDI in the US has been rising (however it is measured) while the US Dollar has depreciated against host country currencies. This indicates that the conventional result of a host country depreciation encouraging FDI should be found in this case. Again two measures of inward FDI, namely MNE sales and FDI inflows, are used as proxies for the dependent variables. The independent variables are the same as in the estimations of the determinants of US outward investment. The results of this exercise are reported in Tables 6 and 7.

Inspection of the results shows that the level of the exchange rate negatively affects inward FDI. Inward FDI increases as the foreign currency appreciates against the dollar, a result consistent with previous studies of the effect of exchange rate levels on investment in the US (Froot and Stein, 1991). However, given the previous result for US outward FDI the causal link between exchange rates and FDI appears doubtful. More important from our point of view, is the finding that even for the case of US inward FDI the exchange rate volatility measures are again statistically insignificant suggesting that volatility does not impact on US inward FDI.

[Tables 6 and 7 here]

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[9] Note, however, that it is consistent with Campa's (1993) finding of an appreciation of the dollar leading to an increase in FDI into the US. Campa, however, uses very different data, namely the

5. Conclusions

This paper analyses the relationship between movements of the real exchange rate and foreign direct investment. We investigate this issue empirically examining both direct investment from the US to 12 countries and investment from these 12 countries to the US. In our empirical analysis, using measures for volatility and exchange rate expectations taken from the related literature, we find no evidence for an effect of exchange rate variation on either US outward investment or inward investment in the US. This result is robust to the two measures of FDI used – financial flows from the parent and MNE sales abroad – the choice of either outward or inward FDI, and a number of different estimation procedures. It is, however, in contrast with results obtained in the earlier literature (e.g., Campa, 1993, Cushman 1985, 1988). Since we use more recent data than used previously one explanation for our results is that over time, and with the increased maturity of foreign investment, volatility has less impact on foreign operations. Perhaps markets for exchange rate hedging have become more developed allowing MNEs to protect themselves against exchange rate risk.

As far as the level of the exchange rate is concerned the empirical estimations yield different results for US outward and inward FDI, which appear to be contradictory. We find a positive relationship between US outward investment and appreciation in the host country currency while there is a negative relationship between US inward investment and appreciation in the dollar. Essentially our period of analysis has seen a depreciation in the Dollar against most of the host country currencies, combined with increased outward FDI to those countries, and increased inward FDI from them. Given these external conditions the results on the level of the exchange rate may perhaps not be meaningful.

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number of foreign entrants into US wholesale industries.

Can our results contribute anything to the policy debate of whether foreign firms'
location decisions are crucially dependent on the level and most importantly the
volatility of the exchange rate? Or to be more precise, is it likely that foreign firms
may leave, or choose not to invest in the UK were the UK not to join the Euro area?
On a general level, our results cast doubt as to the credibility of the threats of foreign
firms concerning the exchange rate. To be sure, however, to be in a position to make
such a conclusion more strongly one would need to focus in more detail on
investment in the EU and in particular in the UK.

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[10] For example, Cushman (1985) covers the period 1963 to 1978.

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Tables

Table 1: Description of control variables

Variable	Description	Definition	Source
l	log of relative labour costs	Relative hourly compensation rates in manufacturing per unit output partner / US (in US dollars)	US Department of Labor
k	log of relative interest rate	Relative interest rate (3 months lending rate) in partner / US	IMF, International Financial Statistics various years
$gdpp$	log of partner country GDP	GDP in US dollars deflated using GDP deflators	IMF, International Financial Statistics various years
$gdpus$	log of US GDP	GDP in US dollars deflated using GDP deflators	IMF, International Financial Statistics various years
fc	log of freight costs	The ratio of imports c.i.f. (i.e. including freight costs) to imports f.o.b. (excluding freight costs) for the US and for country j in US $ and excluding agriculture.	NBER Trade Database Disk 1: U.S. Imports 1972-1994 and Disk 3: U.S. Exports, 1972-1994.
d	log of distance	Distance between partner country capital and Washington DC in 1000 miles	http://www.eiit.org/
$lang$	language	Dummy = 1 if official partner language is English	

Table 2: Development of the real exchange rates

	1983	1985	1987	1989	1991	1993	1995
Canada	1.21	1.38	1.32	1.17	1.16	1.34	1.45
France	7.83	8.83	5.76	6.28	5.68	5.75	5.15
Germany	2.30	2.76	1.70	1.85			
Hong Kong	9.62	9.65	9.06	8.01	7.40	6.53	6.10
Italy	1974.60	2216.79	1390.00	1409.69	1196.89	1464.38	1466.86
Japan	203.14	213.29	133.94	135.16	136.18	116.06	103.58
Korea	878.49	982.22	895.60	707.69	695.71	720.14	651.30
Singapore	1.87	2.13	2.16	1.95	1.74	1.61	1.38
Spain	189.08	201.81	132.25	121.52	100.94	117.31	110.44
Sweden	9.42	10.01	6.95	6.70	5.81	7.61	6.89
Switzerland	1.99	2.39	1.45	1.63	1.41	1.45	1.18
UK	0.73	0.85	0.65	0.62	0.55	0.64	0.61

Table 3: Summary statistics

	1985		1989		1993	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Outward FDI						
MNE sales	10.473	1.084	10.816	1.062	10.735	1.067
FDI flows	6.483	1.485	6.877	1.531	7.539	1.306
Inward FDI						
MNE sales	10.333	1.854	9.958	2.276	10.045	1.987
FDI flows	6.446	2.204	7.198	1.744	6.822	1.638
Controls						
R	2.898	2.705	2.566	2.635	2.702	2.696
s	0.027	0.013	0.022	0.011	0.022	0.010
trend (i)	-0.012	0.007	-0.004	0.003	-0.005	0.004
trend (ii)	0.008	0.004	-0.007	0.003	0.003	0.004
l	-0.889	0.732	-0.424	0.710	-0.337	0.580
k	-0.016	0.649	-0.044	0.649	-0.059	1.632
gdpp	12.482	1.374	12.709	1.346	12.687	1.284
gdpus	15.261	0.000	15.385	0.000	15.451	0.000
fc	6.043	0.990	6.049	0.959	5.864	1.054
d	8.810	0.774	8.810	0.774	8.815	0.812

Note: Change in *d* in 1993 is due to Germany dropping out of the sample after 1989.

Table 4: Regression results for US outward MNE sales

	Perfect Forecast			Static Expectations		
	OLS	FE	RE	OLS	FE	RE
R	-0.181 (0.026)***	-0.671 (0.252)***	-0.189 (0.082)**	-0.179 (0.025)***	-0.797 (0.212)***	-0.302 (0.105)***
σ	6.127 (6.626)	0.810 (2.108)	-0.184 (2.007)	8.671 (6.306)	1.880 (1.773)	1.264 (1.760)
Trend	6.127 (7.102)	-3.283 (3.419)	2.005 (2.461)	-4.338 (5.582)	2.973 (2.207)	-0.195 (1.889)
Relative labour cost	-0.305 (0.157)**	-0.064 (0.174)	0.040 (0.142)	-0.297 (0.161)*	-0.201 (0.159)	0.012 (0.133)
Relative interest rate	-0.115 (0.060)*	-0.043 (0.019)**	-0.041 (0.019)**	-0.124 (0.061)**	-0.041 (0.018)**	-0.038 (0.018)**
$GDP_{partner}$	0.695 (0.095)***	0.562 (0.224)**	0.611 (0.146)***	0.656 (0.091)***	0.861 (0.200)***	0.717 (0.157)***
GDP_{US}	1.678 (0.791)**	0.171 (0.410)	0.478 (0.355)	2.085 (0.769)***	0.038 (0.366)	0.430 (0.335)
Freight	0.052 (0.089)	-0.002 (0.042)	-0.022 (0.041)	0.096 (0.085)	0.039 (0.040)	0.015 (0.040)
Distance	-0.238 (0.107)**	--	-0.074 (0.285)	-0.239 (0.105)**	--	0.047 (0.389)
Language	0.324 (0.187)*	--	0.450 (0.505)	0.345 (0.187)*	--	0.264 (0.692)
Obs.	108	108	108	108	108	108
F	46.81***	22.71***		46.76***	27.22***	
Wald			201.27***			221.18***
Adj. R^2	0.81	0.37	0.79	0.81	0.46	0.74

Notes: Standard errors in parentheses, *, **, *** denote statistical significance at the 10, 5, 1 percent level respectively

Table 5: Regression results for US outward FDI flows

	Perfect Forecast			Static Expectations		
	OLS	FE	RE	OLS	FE	RE
R	-0.235	-2.213	-0.322	-0.228	-0.526	-0.304
	(0.063)***	(2.123)	(0.143)**	(0.061)***	(1.659)	(0.180)*
σ	5.821	-5.422	-2.531	2.524	-11.471	-8.684
	(16.322)	(18.191)	(15.781)	(15.602)	(15.822)	(14.577)
Trend	8.454	11.125	17.295	-6.165	-10.582	-8.611
	(16.242)	(28.576)	(15.912)	(12.935)	(18.208)	(13.179)
Relative labour cost	-0.231	-2.578	-0.943	-0.203	-1.155	-0.800
	(0.382)	(1.469)*	(0.698)	(0.384)	(1.298)	(0.747)
Relative interest rate	-0.129	-0.080	-0.081	-0.161	-0.077	-0.074
	(0.139)	(0.146)	(0.135)	(0.144)	(0.143)	(0.133)
GDP$_{partner}$	0.827	1.789	1.173	0.823	0.894	1.032
	(0.242)***	(2.017)	(0.411)***	(0.231)***	(1.671)	(0.458)**
GDP$_{US}$	2.074	5.215	3.894	2.433	4.536	3.643
	(1.925)	(3.578)	(2.223)*	(1.836)	(3.015)	(2.240)*
Freight	-0.256	-0.440	-0.388	-0.222	-0.213	-0.217
	(0.220)	(0.349)	(0.289)	(0.207)	(0.335)	(0.288)
Distance	0.257	--	0.092	0.287	--	0.049
	(0.248)		(0.495)	(0.242)		(0.621)
Language	0.534	--	0.042	0.649	--	-0.001
	(0.427)		(0.893)	(0.427)		(1.110)
Obs.	92	92	92	95	95	95
F	8.78***	1.66		8.52	1.05	
Wald			23.23***			14.85
Adj. R^2	0.46	0.22	0.49	0.44	0.31	0.46

Notes: Standard errors in parentheses, *, **, *** denote statistical significance at the 10, 5, 1 percent level respectively

Table 6: Regression results for US inward MNE sales

	Perfect Forecast			Static Expectations		
	OLS	FE	RE	OLS	FE	RE
R	-0.313	-0.538	-0.318	-0.278	-0.696	-0.413
	(0.058)***	(0.469)	(0.105)***	(0.056)***	(0.438)	(0.217)*
σ	-18.269	5.722	5.576	-13.346	5.008	4.712
	(14.634)	(3.793)	(3.979)	(13.770)	(3.397)	(3.271)
Trend	-21.262	-9.150	-7.956	24.017	6.253	4.769
	(16.510)	(6.033)	(4.940)	(12.097)**	(4.371)	(3.635)
Relative labour cost	1.639	-0.124	0.012	1.698	-0.262	-0.102
	(0.369)***	(0.364)	(0.293)	(0.237)***	(0.352)	(0.280)
Relative interest rate	-0.213	-0.067	-0.065	-0.217	-0.066	-0.065
	(0.135)	(0.034)*	(0.037)*	(0.136)	(0.035)*	(0.034)*
$GDP_{partner}$	0.838	1.207	1.365	0.735	1.540	1.459
	(0.217)***	(0.432)***	(0.219)***	(0.205)***	(0.422)***	(0.326)***
GDP_{US}	-0.527	1.825	1.598	-1.697	1.459	1.598
	(1.873)	(0.754)**	(0.719)**	(1.723)	(0.712)**	(0.648)**
Freight	0.580	-0.039	-0.010	0.635	0.012	0.004
	(0.194)***	(0.075)	(0.080)	(0.186)***	(0.078)	(0.074)
Distance	0.357	--	-0.054	0.431	--	0.039
	(0.245)		(0.356)	(0.241)*		(0.807)
Language	0.714	--	0.552	0.801	--	0.337
	(0.456)		(0.638)	(0.446)*		(1.444)
Obs.	99	99	99	102	102	102
F	35.71***	17.14***		37.24***	19.42***	175.33***
Wald			181.95***			
Adj. R^2	0.78	0.66	0.73	0.78	0.66	0.73

Notes: Standard errors in parentheses, *, **, *** denote statistical significance at the 10, 5, 1 percent level respectively

Table 7: Regression results for US inward FDI flows

	Perfect Forecast			Static Expectations		
	OLS	FE	RE	OLS	FE	RE
R	-0.505	-12.236	-0.505	-0.526	-13.170	-0.526
	(0.101)***	(3.929)***	(0.101)***	(0.111)***	(4.469)***	(0.111)***
σ	0.722	30.411	0.722	-0.3490	23.360	-3.491
	(19.454)	(19.816)	(19.454)	(18.652)	(17.817)	(18.652)
Trend	5.216	-0.173	5.216	-1.925	-1.472	-1.925
	(20.514)	(32.908)	(20.514)	(16.931)	(24.158)	(16.931)
Relative labour cost	-0.126	-11.708	-0.126	-0.186	-12.956	-0.186
	(0.528)	(3.644)***	(0.528)	(0.550)	(3.867)***	(0.550)
Relative interest rate	-0.320	-0.096	-0.320	-0.228	-0.045	-0.228
	(0.227)	(0.269)	(0.227)	(0.247)	(0.276)	(0.247)
$GDP_{partner}$	1.062	9.163	1.062	1.065	9.468	1.065
	(0.335)***	(3.370)***	(0.335)***	(0.340)***	(2.891)***	(0.340)***
GDP_{US}	0.685	0.689	0.685	-0.410	2.327	-0.410
	(2.255)	(4.278)	(2.255)	(2.277)	(3.582)	(2.277)
Freight	0.379	-0.045	0.379	0.289	-0.059	0.289
	(0.262)	(0.350)	(0.263)	(0.244)	(0.349)	(0.244)
Distance	0.148	--	0.148	0.207	--	0.207
	(0.295)		(0.296)	(0.300)		(0.300)
Language	-0.229	--	-0.229	-0.484	--	-0.484
	(0.657)		(0.657)	(0.730)		(0.730)
Obs.	68	68	68	67	67	67
F	15.08***	2.03*		12.32***	2.00*	
Wald			150.81***			123.16***
Adj. R^2	0.67	0.25	0.73	0.63	0.26	0.69

Notes: Standard errors in parentheses, *, **, *** denote statistical significance at the 10, 5, 1 percent level respectively

Figures

Figure 1: Development of real outward and inward MNE sales between US and sample countries in 1990 million $
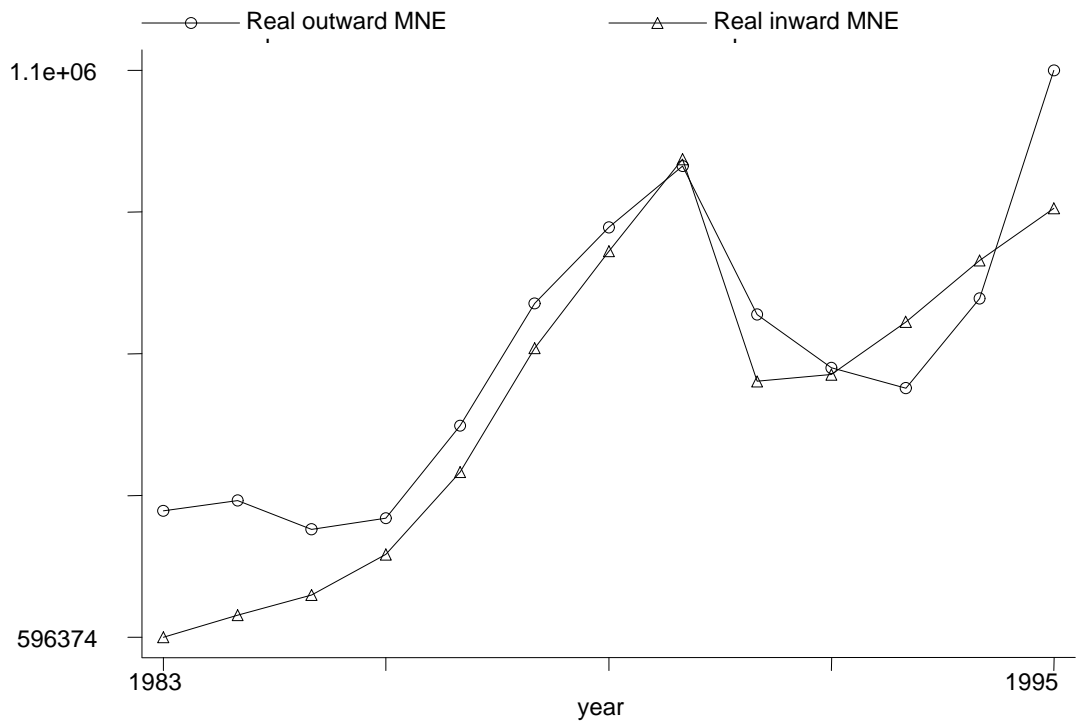
Figure 2: Development of real outward and inward FDI flows between US and sample countries in 1990 million $