DETERMINANTS OF U.S. FOREIGN DIRECT INVESTMENT IN EUROPEAN UNION: CASE OF U.K., FRANCE, AND GERMANY

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ABSTRACT

The purpose of this study is to analyze the determinants of U.S. FDI on three European Union (EU) countries. The purpose of the research is two fold; (1) to determine the factors that affect U.S. FDI in these EU countries, and (2) to analyze the current trend of U.S. FDI towards these EU countries. Different multiple regression analyses will be performed to obtain the economic results of this study. A comprehensive model will be tested for economic variables from 1977 to 1997.

INTRODUCTION

The growth of FDI during the past thirty years has given multinational corporations a decisive role in shaping the patterns of trade and investment around the world. Although the U.S. had always been the top provider of FDI to the rest of the world, the Japanese took over the first spot in the late eighties. The U.S. again become the world=s biggest provider of FDI in the early nineties. The U.S. led the rest of the world with the highest absolute FDI inflows of $76.5 billion and FDI outflows of $74.8 billion in 1997 (United Nations, 1998). In general, from the seventies to the early nineties, global FDI grew at an average of 13 percent per year. That trend is consistent with the picture that emerges from a casual observation of the year-to-year movements in FDI flows.

Although the United States is still the major source of FDI in many countries around the world, its role has somewhat changed since the mid-eighties.

This is partly due to the fact that there is more competition in the global market place than before, and due to the new economic order in many parts of the world. For instance, today there are more nations competing aggressively with the U.S. by supplying FDI in an increasing amount. Many countries are liberalizing their FDI policies and opening up their markets to foreigners.

LITERATURE REVIEW

A survey of existing literature shows that there are studies of U.S. FDI in this region but they are outdated and many of them date back even before the creation of European Community (EC) in 1958. Since then explanations of the growth and pattern of U.S. FDI in EC have mainly focused on the size and rate of growth of the internal market, the effects of the formation and expansion of the EC, and the consequences of the U.S. capital controls program from 1965 to 1972. Bandera and White (1968), Scaperlanda and Mauer (1969, 1973), Schmitz and Bieri (1972), Lunn (1980), and Scaperlanda and Balough (1983) have all shown market size to be a salient explanatory variable of U.S. FDI in this region.

In tests in which both the level of GNP and growth of GNP are included as explanatory variables, the specific effect of the rate of market growth on U.S. FDI in the EC has been enigmatic and inconsistent. For example, Scaperlanda and Mauer (1969) tested three EC growth variables and found each to be insignificantly associated with inbound U.S. investment, and often wrongly signed. Schmitz and Bieri (1972), discovered that the EC=s share of total U.S. FDI was negatively (and sometimes significantly) related to the EC=s rate of growth from the period 1952 to 1958, but positively related for the period 1959 to 1966.

In their attempt to proxy the implementation of tariff changes resulting from the formation of the EC, Scaperlanda and Mauer (1969) used the ratio of U.S. exports to the EC divided by intra- EC exports and found that this proxy variable was not significantly related but has the wrong sign. Lunn (1980) employed U.S. exports to the EC divided by U.S. exports to the world minus the same ratio from the previous year as an explanatory variable and found that it had a significant negative relationship to the inward direct investment as hypothesized. Others such as Aharoni (1966), Usher (1977), Shaw and Toye (1978), Lim (1983), Rolfe and White (1992) concluded that key attractions of FDI are such factors as market size, GNP growth, and country stability. Rueber (1973) and Root and Ahmed (1978) agreed that market size, GNP and stability factors are

probably more important. Evans and Doupnik (1986) stated profit repatriation is the first priority. Cable and Persaud (1987) partially agreed but expressed unwillingness to write off the value of incentives such as tax holidays. The research is conducted to analyze the determinants of U.S. FDI on the European Union (EU) countries, specifically U.K., France and Germany. The purpose of the research is two fold. First it will determine the factors that affect U.S. FDI in these EU countries, specifically examine empirically the determinants which influence U.S. FDI. The examination of these determinants of FDI in these countries is more important than ever for both home country (U.S.) and host countries due to the interdependent nature of the global economy today. Second the study will analyze the current trend of U.S. FDI towards these EU countries. It is also hypothesized that the U.S. FDI into these countries is impacted by the membership in the regional integration framework (in this case EU), by the creation of the Euro (the new common currency in the EU), and by new competition from other industrialized nations such as Japan. This brings many changes to the region; among them, their economic policy harmonization and new measures to liberalize FDI framework among them. These changes will have a direct impact on U.S. FDI policy in these countries.

DATA AND RESEARCH METHODOLOGY

The U.S. has a large influence in many parts of the world in terms of FDI. The U.K. and western Europe have been big beneficiaries of this large outflow. For instance, half of all U.S. FDI abroad went to western Europe and of that, forty percent went to U.K. (Bureau of Economic Analysis, 1997). Therefore, the U.S. plays a vital role in the region as provider of FDI.

A list of FDI determinants (demand and supply determinants) has been discussed and tested in the literature (see Lunn, 1980; Scaperlanda & Balough, 1983)). Such factors as relative profit rates or differentials, local market size and growth, past levels of FDI, and the investment climate in terms of regulations and incentives have been suggested by various authors such as Dunning (1980) and Froot and Stein (1991). Some of the factors most commonly mentioned are:

(a) *Profitability*: FDI movements are generated by the expectation of higher profits, this depends on factors related to market size, growth, and the foreign investment climate.

(b) *Market variables*: Local market size and growth variables have been widely supported in the literature as determinants of FDI. A growing market will attract foreign investment because of the possibility of efficient on-site production through the realization of economies of scale. Another factor is the discount rate in the local economy. When interest rates rise, capital inflows from foreign countries generally increase. When interest rates fall, there is a capital flight (Chacholoades, 1990).

(c) *Trade flows and trade discrimination*: Trade discrimination through the imposition of high tariffs or the use on non-tariff barriers on trade encourages FDI as foreign firms try to produce under shelter. The higher the tariff, the greater would be the incentive for the foreign producer to produce locally in order to maintain the market. A trade deficit appropriately lagged may encourage foreign capital inflows and are likely to simulate FDI if the result of generally poor trade performance is a desire for export diversification and a shift toward import substitution policies.

(d) *Exchange rate*: Aliber (1983) maintained that the key attribute of multinational corporations (MNCs) is not that it engaged in foreign production, but that it financed at least part of the production in its home currency. He suggested that the strongest currency provides companies an advantage in investing over weaker currencies, because of investors preference for securities denominated in the strong currency and hence a cheaper cost of capital. On the other hand, Froot and Stein(1991) implied that a strong home currency discouraged and weaker currency encouraged FDI in the nation.

(e) *Unemployment and wage rate*: Islam and Maniam (1993) used supply determinants such as the unemployment rate and the wage rate to explain FDI. For instance, the U.S. unemployment rate is a good proxy for the business cycle when used as a determinant of FDI outflow from the U.S.

(f) *Political Stability*: Rueber et al (1973) and Root and Ahmed (1978), agreed that political stability may also be an important factor in attracting FDI.

(g) *Tax Incentives and Tax Holidays*: Cable and Persaud

(1987) and others refused to discount the idea that incentives like lower corporate tax and tax holidays encourage inward FDI.

A comprehensive econometric model will be tested with the following variables and hypothesis:

$$RFDI = B_0 + B_1GDP + B_2CGDP + B_3TB_{-1} + B_4ER + B_5USEM + B_6STB + B_7TIN + E_t,$$

where

RFDI is the dependent variable which measures the U. S.(home country) foreign direct investment and GDP ratio. The independent variables capture some demand and supply determinants of the U.S. investments in host country and home country.

GDP = GDP in dollars that measures the market size of host country which is expected to be positive.

CGDP = Annual real growth rate of GDP that measures the growth rate of market size of the host country which is expected to be positive.

TB_{-1} = Trade balance of the host country measured in U.S. dollars which is equal to the total export minus total imports lagged one year and it is expected to have an ambiguous sign.

ER = Real exchange rate which measures the real exchange rate of domestic currency in terms of U.S. dollars and it is expected to have a negative sign. It is the average rate at year end.

USEM = U.S. unemployment rate (proxy for business cycle) which is expected to have a negative sign.

STB = Dummy variable represents political/economic stability (1= if country is stable, 0 = otherwise) and is expected to have a positive sign.

TIN = Dummy variable represents tax incentive and tax holidays (1= if large tax incentive and holidays, 0 = otherwise) and is expected to have a positive sign.

E_t = Stochastic disturbance term, is assumed to be white noise.

The test will first be conducted using the entire observation period (1977-1997) and repeated using two sub-period data for each country (1977-1986, 1987-1997). Any serial correlation or auto correlation will be corrected and the

model should provide a good indication of the variables that are significant determinants of U.S. FDI in these countries.

The data will be collected from secondary sources for the period 1977-1997, from various issues of Balance of Payment Yearbook, International Financial Statistics, and Department of Commerce- Bureau of Economic Analysis. Online material from sources such as Data Stream and various others will also be used to gather the most recent information and data.

EMPIRICAL RESULTS

Table I provides the estimated values of the coefficients and their corresponding t-statistics using the Ordinary Least Square (OLS) tests for the entire testing period (1977-1997). The OLS estimation shows that all the estimated coefficients have correct theoretical signs, although some of them are not significant. In the case of U.K., the GDP and TB variables are significant at the one percent level and USEM is significant at the five percent level. For France, TB, STB, and TIN are significant at the one percent level, and the GDP is significant only at the five percent level. For Germany, only the GDP variable is at the one percent level and all the other variables are not significant. Therefore it is safe to say that the market size (GDP) is significant in all three countries, meaning that the OLS analysis provide compelling statistical evidence that the market size hypothesis is valid for FDI in these developed countries as suggested in the literature. The trade balance variable, lagged by one period is significant for U.K. and France but not for Germany. The two dummy variables, STB and TIN, representing political stability and tax incentive respectively, are significant for France at the one percent level but they are not significant for U.K. and Germany. This is not surprising since many investors view British and the German governments more stable than the French government. Since French government has the tendency to provide more tax incentives than U.K. and Germany.

What is most puzzling is the growth of the market, measured by CGDP, which is insignificant for all three countries. In other words, the growth of the market irrespective of its level, does not exert any significant influence in the inflow of U.S. FDI. The USEM is significant for the U.K. market and not for the other two countries. Hence, high unemployment rate in the U.S. has a direct significant impact of the determinants of U.S. FDI in U.K. This finding is not surprising especially for the U.K. market since it absorbs about forty percent of all U.S. FDI that goes to Western Europe. On the other hand, the regression analysis did not provide any support that there is a strong link between the

movement of real value of the host country currency and the inflow of U.S. FDI, as suggested by Froot and Stein (1991).

Table I also shows that the estimated adjusted R2 is quite high for the three countries, meaning the large variation of the dependent variable (RFDI) is explained by the regression. This means that these three regression equations are a good fit. For all three countries, the F-statistics is also significant at a one percent, which implies that these independent variables explain well about the dependent variable and its impact on the economy.

TABLE I
Regression Analysis of the Determinants of U.S. FDI
in U.K., France and Germany from 1977 to 1997

Coefficients	U.K.	France	Germany
B_0	-4377.401 (-5.997)**	-328.837 (-0.836)	-55.752 (-1.022)
B_1	51.086 (9.659)**	3.435 (2.687)*	4.290 (7.111)**
B_2	5.154 (0.330)	3.422 (-0.752)	7.484 (-1.763)
B_3	15.143 (4.977)**	3.996 (7.074)**	0.482 (1.894)
B_4	-3.536 (-1.672)	-1.744 (-0.627)	-0.979 (-1.362)
B_5	-86.022 (-2.622)*	-8.538 (-1.505)	-8.084 (-1.566)
B_6	86.564 (1.037)	51.735 (3.276)**	70.012 (1.470)
B_7	122.986 (1.752)	55.911 (3.569)**	54.006 (1.292)
R^2	0.96187	0.97216	0.97099
Adjusted R^2	0.94134	0.95717	0.95538
F-Statistics	46.847**	64.86057**	62.17138**

** and * indicate significance at the 1% and 5% levels respectively

The regression analysis is then repeated by breaking the data set into two sub-periods (from 1977-1986 and 1987-1997). These sub-periods are chosen because since the late eighties the FDI from other countries have increased, and U.S.= role as the major provider of FDI around the world have somewhat diminished due to competition from other industrialized nations such as Japan.

Tables II, III and IV provide the results of U.K., France, and Germany respectively.

The question is whether there is a significant difference in the regression estimates between these two sub-periods. The most interesting result of this analysis is that all the variables have the correct theoretical sign but most of them are not significant at the one or five percent level. For U.K., the F-statistics of the regression equation is significant at the one percent level for the first sub-period and at the five percent level for the second sub-period. Similarly, for France, the F-statistics is significant at the one percent level for both sub-periods.

TABLE II: Regression Analysis of the Determinants of U.S. FDI in U.K. for two sub-periods (1977-1986 and 1987-1997)

Coefficients	1977-1986	1987-1997
B_0	-1066.025 (-3.066)**	-4434.852 (-1.394)
B_1	12.967 (3.132)	57.0490 (2.079)
B_2	17.086 (1.115)	12.620 (0.310)
B_3	0.172 (0.055)	7.732 (0.301)
B_4	-2.475 (-3.559)	-9.902 (-0.804)
B_5	26.459 (2.323)	142.928 (1.557)
B_6	35.168 (0.617)	77.658 (0.181)
B_7	1.156 (0.119)	75.741 (-0.109)
R^2	0.99744	0.96867
Adjusted R^2	0.98851	0.89557
F-Statistics	111.611**	13.25116*

** and * indicate significance at the 1% and 5% levels respectively

TABLE III: Regression Analysis of the Determinants of U.S. FDI in France for two sub-periods (1977-1986 and 1987-1997)

Coefficients	1977-1986	1987-1997
B_0	-35.116 (-0.172)	-1338.318 (-1.825)
B_1	2.256 (1.953)	13.326 (1.776)

B_2	3.229 (0.630)	2.647 (0.406)
B_3	1.540 (2.193)	2.147 (1.168)
B_4	-3.193 (-1.532)	-4.005 (-1.281)
B_5	-2.177 (-0.612)	-2.244 (-0.217)
B_6	1.131 (0.085)	32.479 (0.708)
B_7	15.383 (1.172)	58.139 (0.839)
R^2	0.98721	0.98721
Adjusted R^2	0.95737	0.95737
F-Statistics	10.35045**	33.08450**
** and * indicate significance at the 1% and 5% levels respectively		

This is to say that these variables significantly explain the determinants of FDI in these two countries. But in the case of Germany, the F-statistics is only significant at the ten percent level, meaning that these variables do not explain very well the determinants of U.S. FDI into Germany. In the same token, it also implies the possibility of omission of other relevant variables. Further test was conducted to test for auto-correlation and the test revealed the absence of auto-correlation on the estimation process. Consequently, the possibility of any missing variable in finding the determinants of U.S. FDI in these countries, especially in Germany is unfounded.

TABLE IV
Regression Analysis of the Determinants of U.S. FDI
in Germany for two sub-periods (1977-1986 and 1987-1997)

Coefficients	1977-1986	1987-1997
B_0	-1137.778 (-1.799)	-134.655 (-0.455)
B_1	16.506 (2.193)	2.901 (1.702)
B_2	26.070 (2.927)	2.788 (0.307)
B_3	0.018 (0.040)	0.316 (0.322)
B_4	-2.903 (-2.139)	-2.998 (-1.043)

B_5	-16.279 (-0.902)	-4.957 (-0.204)
B_6	37.543 (0.866)	32.878 (0.389)
B_7	26.779 (0.871)	29.115 (0.338)
R^2	0.95389	0.92601
Adjusted R^2	0.79252	0.75335
F-Statistics	5.91116	5.36341
** and * indicate significance at the 1% and 5% levels respectively		

The objective of this study is also to observe the trend of U.S. FDI in these countries over the last twenty years. Using the sub-periods data (1977-1986 and 1987-1997) and the overall period data (1977-1997), the mean of FDI and the mean growth of FDI is calculated for each country, as shown in Table V. The result clearly shows that U.K. has been the major recipient of U.S. FDI over these years, both in terms of absolute FDI inflows as well as in the annual growth rate of FDI. This is not surprising since U.K. receives about forty percent of all U.S. FDI that goes to western Europe (Bureau of Economic Analysis, 1997). It is interesting to note that the annual growth rate of U.S. FDI from first sub-period (1977-1986) to second sub-period (1987-1997) for these three countries. For the U.K., it increased from 8.97 percent to 14.52 percent, for France it increased from 4.39 percent to 14.21 percent, but for Germany, it increased from 7.53 percent to 7.80 percent only. In other words, even though German reunification process did cause some influx of U.S. FDI into Germany although it is not as significant as previously thought. The most recent data also suggested that U.K. is still the top recipient of U.S. FDI in Western Europe (Bureau of Economic Analysis, 1999).

TABLE V: Trends of U.S. FDI in U.K., France and Germany (Based on Historical Cost Position)

		Sub-Period I (1977-1986)	Sub-Period II (1980-1997)	Overall Period (1977-1997)
U.K.	Mean of FDI (millions of $)	$27980.8	$90261.9	$60604.2
	Mean Growth of FDI	8.97%	14.51%	114.7%

France	Mean of FDI (millions of $)	$7825.6	$23291.8	$15926.9
	Mean Growth of FDI	4.39%	14.21%	9.79%
Germany	Mean of FDI (millions of $)	$15367	$34479.6	$25378.3
	Mean Growth of FDI	7.53%	7.80%	7.68%

SUMMARY AND CONCLUSION

This study uses annual data for twenty-one years (1977-1997) to observe the determinants of U.S. FDI in the three top industrialized nations in the EU bloc. The regression analysis testing the entire test period shows that the factors that affect U.S. FDI in these countries have the correct theoretical sign in all cases. The market size coefficient (measured by GDP) is significant for all three countries and the trade balance is significant for U.K. and France. The two dummy variables representing political stability and tax incentive are only significant for France and not for U.K. and Germany. The F-statistics is significant for all three regression equations representing these three countries. The R2 is also quite high for all these countries. Breaking the data set into two sub-periods, the test results revealed that although the regression coefficients for all three countries have the correct theoretical sign, they are not significant at the one or five percent levels. But, the F-statistics is still significant at the one or five percent level for U.K. and France but only significant at the ten percent level for Germany. The presence of auto-correlation and possible omission of relevant variables is observed to be unfounded. This implies that these independent variables are significant in explaining the determinants of U.S. FDI in these three European countries.

Finally, looking at the trend of U.S. FDI into these countries revealed that U.K. is receiving bulk of U.S. FDI during these testing period. Looking at the mean absolute FDI and mean growth rate of FDI, revealed an upward trend in all three countries although it is significant in the case of U.K., followed by France and Germany.

In summary, the study provided a clearer picture of the role U.S. FDI plays in these three countries. It is hoped that this study also contributed to an increased understanding of U.S. FDI in this region by providing new insights into variables affecting U.S. FDI. This study also provided a clear framework to look at the role U.S. FDI on other EU countries.

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