

## **Canadian Foreign Direct Investment in the U.S.: A Discrete Choice Analysis Approach**

Sean O'Hagan  
Department of Geography  
University of Western Ontario  
London, ON N6A 5C2  
Canada

William P. Anderson  
Department of Geography  
Boston University  
Boston, Massachusetts 02215-1401  
U.S.A

Canadian researchers have traditionally been most concerned with incoming foreign direct investment (FDI). This preoccupation goes as far back as the late 1870s, when Canada's tariff policy resulted in a large inflow of foreign investment. The net inflow of FDI continued for the next century until the 1970s, when outward FDI by Canadian firms increased so rapidly that Canada became a net exporter of investment.

Understanding the motivations behind Canadian investment abroad is an important research goal. While previous studies have produced valuable results, their conclusions are often in conflict indicating that further research on FDI is necessary. For example, studies by Vertinsky and Raizada (1994) and Rao et al (1994) produce contradictory results on a number of factors.

The main goal of this study is to determine why Canadian firms choose to invest in particular parts of the U.S. Do Canadian firms invest in the United States to gain greater access to large regional markets? Is it for tax purposes? Is it for skilled labour? Is it for low cost labour? This study attempts to answer questions such as these by analysing the spatial distribution of Canadian FDI in the United States from 1974 to 1994. A multinomial logit model is used to determine those factors that attract Canadian FDI to different U. S. states.

## Explaining FDI

FDI is an activity owned, organised, and controlled by a firm (or group of firms) outside its (or their) national boundaries. Specifically, Statistics Canada defines FDI as "an investment that is made to acquire a lasting interest and an effective voice in the management of an enterprise operating in an economy other than that of the investor" (Statistics Canada 1997: 29). Statistics Canada suggests that to obtain an effective voice or control, a direct investor must possess at least ten percent of the equity of an enterprise (Statistics Canada 1997).

Why do firms seek to obtain control of operations in a foreign country? Previous studies have attempted to increase our understanding of FDI through push and pull factors. Pull factors are the aspects of a foreign country that attract investment. On the other hand, push factors are elements of a home country that drive companies to seek investment opportunities elsewhere. Studies (Litvak and Maule 1981; Rugman 1987; Gandhi 1990; Knubley et al 1991; Meyer and Green 1996) repeatedly conclude that pull factors of foreign markets are more important than push factors in Canada. In particular, large foreign markets are attractive to Canadian investors. By examining the distribution of Canadian investment across states, we extend this argument by not only determining the relationship between Canadian FDI and large markets, but additional pull factors as well.

Pull factors can be associated with John H. Dunning's (1977; 1991) Eclectic Paradigm. The principal hypothesis on which the Eclectic Paradigm is based suggests that a firm will engage in FDI if and when three conditions are satisfied. First, a firm must possess ownership advantages. These include such considerations as technology, know-how and brand names, and must be of sufficient value to overcome the risks of locating in an unfamiliar business environment. Second, a firm's motivation to invest abroad depends not only on its ownership advantages, but also on its desire and ability to internalise these ownership advantages. Internalisation is the procedure by which a multinational firm preserves its ownership advantages by establishing a foreign subsidiary rather than leasing or selling its ownership advantages.

The final aspect of the Eclectic Paradigm is locational advantages. Locational advantages determine which countries or regions host production by MNEs. Some areas appear more attractive to FDI than others. Eden (1993) groups locational advantages into three classes: economic, social and political. Economic advantages are based on an area's endowment of labour, capital, natural resources, market and infrastructure. Social advantages take into account the constraints of conducting business between the head office and the subsidiary. For example, language and business customs can have important implications on the location decision. Political advantages are defined as the host region's policy on FDI. Barriers to entry and tax differences significantly affect decisions made by multinational enterprises (Eden 1993). The focus of the statistical analysis in this study is on locational advantages.

### **The Study Defined, the Data Used, and the Limitations**

The data used were acquired from the United States Department of Commerce's *Foreign Direct Investment in the United States, Completed Transactions* for every year from 1974 to 1994. The Department of Commerce gathered information on investments over \$50,000 from public sources, transaction participants, federal regulatory agencies, and miscellaneous contacts. The federal regulatory agencies include the Securities and Exchange Commission, the Federal Trade Commission, and the Federal Reserve Board. Some of the information was also acquired from secondary sources such as newspapers, magazines, and business and trade journals.

The industry (SIC), American state, and year are always provided. Unfortunately, the American city, value of investment, and Canadian location of the investing firm are regularly omitted from transaction information. In addition, the 2102 transactions in the data set include FDI in the form of new plants, acquisition/mergers, joint ventures, equity increases, plant expansion, and real estate. Expansions and equity increases were excluded from this study because they offer little insight in the determination of what attracts Canadian FDI to specific U.S. locations. This type of investment is simply added to an already existing location. In addition, the samples constructed for this analysis used real estate investments only when it was apparent that the real estate purchase was intended for future industrial or commercial output.

The transaction records were divided into 6 overlapping sub-samples for two reasons. First, some transactions have limited information when compared to others. As a result, there is a restriction on the type of analysis that can be completed on these transactions. Second, different categories of transactions may be influenced by different location factors. Sample A is the largest consisting of 1268 transactions. For each transaction in Sample A, the SIC, American state of destination, Canadian province of origin, and year of investment are known. It is an amalgamation of FDI in the form of new plants, acquisition/mergers, joint ventures, and real estate. The value of investment is not always known.

Sample B consists of all transactions in Sample A for which the dollar value of the investment is known. The result is a decrease in sample size to 601 transactions. Sample B is also separated into two sub-samples by investment type. Sample C, which includes all FDI that is either an acquisition or merger, includes 316 observations. Sample D, which includes all FDI that is a new plant, joint venture, or real estate, contains 285 observations.

Sample B is also separated into large investments (Sample E) and small investments (Sample F). Sample E, consisting of 191 observations, includes all investments over and including 54 million dollars (1986 dollars). Sample F, consisting of 410 observations, includes FDI under 54 million dollars (1986 dollars). The 54 million-dollar level was chosen because both samples included a reasonably large number of investments made in a large number of states (At this level small investments are located in 43 states while large investments are

located in 40 states). Since the 54 million dollars is somewhat arbitrary, models were estimated with large and small investments also separated at 20 million dollars and 30 million dollars. Since these additional logit results generally agree with those obtained at the 54 million-dollar level, they are not presented here.

In building the samples, a number of limitations were difficult to avoid. Most significantly, identical conditions were difficult to maintain in the compilation of data over the twenty-one year study period. On average, information provided for investments in recent years is more complete. Since older transactions are missing more information, the restricted samples (B, C, D, E and F) contain a greater proportion of transactions from recent years than does the full sample (A).

For a complete geographical analysis, information relating to the source of the Canadian investment is important. Unfortunately *Foreign Direct Investment in the United States, Completed Transactions* provides only the name of the Canadian investor. In other words, the geographic source of the Canadian investment was not supplied. Therefore, additional sources were consulted to match the head office location with the names of Canadian firms. Information on the location of Canadian investors has improved over time. As a result, greater emphasis has been placed on recent transactions. For example, it was difficult to recover useful information for the study if a company made an investment in 1977 and has ceased operations since. On the other hand, it would be possible to recover information on a similar company that made a transaction in 1994.

### **Geographical Distribution of FDI**

The global distribution of Canadian FDI from 1987 to 1997 is displayed in Figure 1. The dominance of the U.S. as a destination is immediately obvious. In 1997, 52 % of total Canadian FDI ended in the United States. While this proportion has declined (it was 67 % in 1987), the United States is still the most significant recipient. Therefore, a study focused exclusively on Canadian investment in the U.S. can make a significant contribution to our broader understanding of Canadian FDI.

Table 1 uses Sample B to examine the destination of Canadian FDI in the United States. It is important to look at the spatial distribution of investment for two reasons: first because it provides useful information in its own right, and second because observing the destinations that Canadian investors choose can reveal information on the locational advantages that motivate them. Table 1 reveals the distribution of FDI across the United States. This is clearly not a random pattern. A large proportion of the investment is destined for the Eastern United States, especially Northeastern United States. FDI in the Mid-east region and the Great Lakes region account for 60 % of total investment in the United States. The significance of these two regions as a destination for Canadian FDI becomes even more obvious when it is revealed that the Mid-east region and



**FIGURE 1 Geographical Distribution of Canadian Direct Investment Abroad, 1987-1997**

**TABLE 1 Distribution of Canadian FDI (Sample B) Across the United States**

Region	# of Subsid.	% of total Invest.	Gross	Region	# of Subsid.	% of total Invest.	Gross
			State Prod.				State Prod.
Connecticut	17	3.59	1.76	Alabama	13	1.78	1.28
Maine	6	0.07	0.43	Arkansas	2	0.06	0.70
Massachusetts	17	1.59	2.92	Florida	25	3.39	4.40
New Hampshire	0	0.00	0.43	Georgia	12	1.12	2.50
Rhode Island	4	0.68	0.37	Kentucky	11	0.88	1.22
Vermont	7	0.10	0.21	Louisiana	7	0.22	1.59
New England	51	6.03	6.12	Mississippi	4	0.27	0.72
				N. Carolina	19	1.39	2.52
Delaware	8	7.15	0.35	S. Carolina	6	0.27	1.14
Dist. of Columbia	6	0.69	0.66	Tennessee	10	0.16	1.76
Maryland	12	0.34	1.98	Virginia	12	0.43	2.54
New Jersey	14	1.06	3.82	W. Virginia	4	0.06	0.52
New York	76	20.14	8.56	Southeast	125	10.03	20.90
Pennsylvania	24	2.83	4.44				
Mid East	140	32.21	19.83	Arizona	8	0.63	1.24
				New Mexico	2	0.11	0.48
Illinois	20	3.35	4.96	Oklahoma	10	0.60	1.03
Indiana	4	0.10	2.05	Texas	37	4.13	6.74
Michigan	19	2.56	3.58	Southwest	57	5.47	9.49
Ohio	24	19.55	4.09				
Wisconsin	8	1.80	1.80	Colorado	26	4.44	1.30
Great Lakes	75	27.36	16.48	Idaho	3	0.23	0.33
				Montana	0	0.00	0.25
Iowa	2	0.72	0.99	Utah	5	0.24	0.54
Kansas	3	0.78	0.91	Wyoming	1	0.02	0.23
Minnesota	10	1.25	1.82	Rocky Mtn.	35	4.93	2.65
Missouri	11	1.52	1.90				
Nebraska	0	0.00	0.60	Alaska	7	0.32	0.45
North Dakota	4	0.18	0.21	California	55	5.81	13.44
South Dakota	0	0.00	0.23	Hawaii	1	0.04	0.50
Plains	30	4.45	6.66	Nevada	9	2.43	0.56
				Oregon	2	0.09	0.99
				Washington	12	0.84	1.94
				Far West	86	9.53	17.88

Source: FDI in the United States: Completed Transactions (1974...1995).

Note: 1. adjusted for 1986 dollars.

2. Gross State Product for 1986.

Great Lakes region account for 36 % of total gross domestic product.

The Northeastern United States is an important location for FDI. Close proximity to Canadian home offices decreases costs associated with communication and the transportation of parts and components. In addition, the close proximity to a large regional market has made this an attractive location for investment.

Examination of the Southwest, Far West, and Rocky Mountain regions reveal that each of the three regions have one state that acts as a magnet for investment. Based on the sample, California, Texas, and Colorado are the fourth, fifth, and sixth most important states for the entire country in attracting Canadian investment over the twenty-one year study period. While these states are important destinations, these figures are less impressive when judged against gross state product.

The Plains region attracted 4.45 %, making it the least important area for luring FDI. The result is not unexpected as this region accounts for less than 7 % of gross domestic product. A relatively low population and isolation from the main North American markets suggests that this region offers little in the form of locational advantages when compared to the rest of the United States. A little more surprising was the inability of the New England region to attract FDI. With its close proximity to the economic engines of Canada and the United States, there would seem to be locational advantages to investing in this region.

## The Model

When locations of individual transactions are known, discrete choice analysis allows the researcher to consider how investors choose among a set of discrete locations – in this case U.S. states.<sup>1</sup> By comparing characteristics of individual states, it is possible to identify factors that explain why FDI is attracted towards certain places (Carlton 1983; Coughlin et al 1991).

To determine those factors that attract FDI, the multinomial logit model uses the principle of utility maximisation. An investor is assumed to derive some satisfaction or “utility” from choosing to locate in each state and will choose the state with the highest utility (Train 1986). If it were conceivable to know all the pertinent factors that determine an investing firm’s utility, it would be possible to predict where it would invest. Unfortunately, it is not possible to measure all relevant factors that explain utility. To address this problem, the multinomial logit separates utility into two components. The first component is a combination of those factors that the researcher observes, as well as a vector of parameters to be estimated. This is called the systematic utility, designated  $F(z_{in}, S_n, \beta)$ . The

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1. Because of data limitations, states comprise the most detailed geographical unit at which this study could be conducted.

second component, which covers unobservable factors, is called random utility and labelled  $\epsilon_{in}$ . Therefore:

$$U_{in} = F(z_{in}, S_n, \beta) + \epsilon_{in} = V_{in} + \epsilon_{in}$$

where,

$U_{in}$  represents the utility of firm  $n$  derives from locating in state  $i$ ,  
 $z_{in}$  are all the observable characteristics of state  $i$  as faced by Canadian firm  $n$ ,  
 $S_n$  are all the observable characteristics of firm  $n$ ,  
 $\beta$  is a set of parameters,  
 $V_{in}$  is the systematic (observable) component of  $U_{in}$ , and  
 $\epsilon_{in}$  are all the unobservable characteristics of state  $i$  and Canadian firm  $n$ .

Investors are assumed to choose the alternative with the highest utility. Therefore an investor will choose to locate in state  $i$  when:

$$P_{in} = \text{Probability } (U_{in} > U_{jn}, \text{ for all } j \text{ in } J_n, \text{ where } j \text{ is not equal to } i)$$

where,

$U_{in}$  represents the utility that firm  $n$  derives from locating in state  $i$ ,  
 $U_{jn}$  represents the utility that firm  $n$  derives from locating in another state  $j$

If the  $\epsilon_{in}$  are assumed to be independently and identically Gumbel distributed, then the multinomial logit model can be written:

$$P_{in} = \frac{\epsilon^{V_{in}}}{\sum_{j \in J_n} \epsilon^{V_{jn}}}$$

The  $V_{in}$  are assumed to be a linear combination of characteristics of all states in the choice set  $J_n$ . To calculate the probability for an investor to choose each state, the value of the parameters  $\beta$  of the linear function must be estimated. These unknown parameters are estimated using the maximum likelihood method. "A maximum likelihood estimator is the value of the parameters for which the observed sample is most likely to have occurred" (Ben-Akiva and Lerman 1985: 20). The probability of investor  $n$  selecting the state that he actually selected for all investors can be written:

$$\text{Maximum Likelihood} = \prod_{n \in N} \prod_{i \in J_n} P_{in}^{\delta_{in}}$$



Where,

$\delta_{in}$  equals 1 if investor  $n$  chooses state  $i$ , and 0 if he does not choose state  $i$   
 $N$  is the set of investors in the sample

$P_{in}$  in this expression is a function of  $\beta$ . Therefore, holding the observed data fixed, maximum likelihood can be considered a function of  $\beta$ . The  $\beta$  that provides the highest likelihood is called the maximum likelihood estimate of  $\beta$ .<sup>2</sup>

The overall goodness of fit measure for the multinomial logit is:

$$\rho^2 = 1 - \frac{LL_{\beta}}{LL_0}$$

where,

$LL_{\beta}$  is the maximum log likelihood of the estimated model, and  
 $LL_0$  is the maximum log likelihood of the null model (the model with  $\beta$  set to 0).

### Variables Influencing the Location of FDI<sup>3</sup>

We assume that firms seek to maximise profit, so utility maximisation is regarded as synonymous with profit maximisation. In deciding where to locate, investors will undoubtedly investigate how their expected profit levels change from one location to the next. The probability that a specific state is selected as a destination should depend on its economic characteristics that affect profit compared with those of all other states. Therefore, variables tested in this study represent the attractiveness of a state to an investor attempting to maximise profits.

Each variable was collected for the twenty-one year study period and standardised relative to the national average for that year. The anticipated effect

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2. The software chosen for this study, LimDep, maximises the log of this likelihood function.
  3. Population change is calculated as state population at year  $t$  minus state population at year  $t-1$ ; Employment change is calculated as state total employment at year  $t$  minus state total employment at year  $t-1$ ; Distance is calculated as the highway distance from a central node in the province of origin to a central node in the state of destination. Generally, the dominant city in the state or providence was used as the central node. In cases where a dominant city was not present, the distance was calculated for dominant cities and then averaged (e.g. Alberta - Calgary and Edmonton or California - Los Angeles, San Francisco and San Diego); Maximum Tax Rate - Advisory Commission on Intergovernmental Relations (1975...1995) *Significant Features of Fiscal Federalism*, US Government Printing Office: Washington, DC.; and, the remaining independent variables were compiled from: U. S. Department of Commerce (1975-1995) *Statistical Abstract of the United States: The National Data Book*, U. S. Government Printing Office: Washington, DC.

of each variable on the probability of an FDI is displayed in Table 2.

Past literature suggests that the huge American market has been an attractive locational advantage to foreign investors worldwide. A host country population

**TABLE 2 List of Variables and Expected Relationship with FDI**

Variable	Hypothesis
MARKET INDICATORS	
Per capita income	+
Population	+
Population change	+
LABOR INDICATORS	
Average pay	-
Unionisation	-
Unemployment	+
Total employment	+
Employment change	+
EDUCATION INDICATORS	
BA	+
High school	+
PHYSICAL AND SOCIAL INDICATORS	
Distance	-
Poverty	-
COMMERCE INDICATORS	
Maximum tax rate	-
Shoreline	+
Port	+

ten times greater than Canada provides a number of economic advantages. Since market seeking is a major incentive for Canadian FDI, we should expect the states with the largest markets to be attractive destinations. Therefore, per capita income, population, and population change, which measure state-level market demand, are expected to be positively associated with FDI. As per capita income and population increase so should the demand for a firm's products. Greater income and population indicate an increasing number of potential customers in the area. This is advantageous to a firm entering an unfamiliar business environment. If Canadian FDI is motivated to locate in the United States to sell its output, a positive association with these three variables should result.

Investors may also attempt to take advantage of low cost factors of production. Decreasing costs can increase profitability. The higher the costs, the less desirable a state will be. Labour costs are generally the most important costs of production. To maximise profit, investors should choose to make FDI in states where labour costs are relatively low and labour productivity is relatively high. The most visible labour costs are average wages. This represents the average annual wage earned by a worker in a state. As average pay in a state increases, it should appear less attractive to investors.

Two variables were used to test access to a skilled labour force. The first is the percentage of a state's population over the age of twenty-five with a bachelor's degree and the second is the percentage of a state's population over the age of eighteen with a high school diploma. To analyse the significance of skilled labour, we assume that increased education results in a more productive, higher skilled labour force. Therefore, if investors are motivated to locate in the United States to access skilled labour, level of education should be positively related to the amount of FDI.

Unionisation, which is the percentage of the state work force unionised, is expected to discourage FDI. This is anticipated because unionisation tends to reduce the return on investment by increasing production costs. Cooke (1997) points out that investors might prefer to avoid locating in highly unionised states for three reasons. First, unions may limit the ability to control the work force. Second, bargaining, strikes, and other conflicts with unions tend to increase costs. Third, power held by unions is understood to be comparable to that of a monopoly.

However, it is possible for unionisation to be positively related to FDI. A number of studies (Beeson and Husted 1989; Cooke 1997) point out that negative effects of unionisation can be counterbalanced by improved performance of employees. A greater voice in the company direction may increase worker productivity, which offsets the higher wages associated with unionisation. In addition, job security provided by unionisation increases employee commitment and flexibility. Nonetheless, our prior expectation is that unionisation will deter FDI.

The unemployment rate represents the percentage of a state's workforce not employed. If unemployment is perceived as an indicator of available workers, then unemployment should be positively related to FDI. High unemployment means that firms are able to hire workers at lower costs. As the labour market approaches full employment, wage rates tend to increase which, as indicated earlier, is less desirable when attempting to maximise profits.

To properly investigate agglomeration economies, this study should analyse firms locating in areas where related and supporting industries already exist. Unfortunately, the sample sizes would be too small if this study separated FDI into separate industries. Instead, total number of employees in a state and employment change will be used as substitutes. Glickman and Woodward (1988) suggest that FDI should be attracted to locations with abundant activity already in the area because these areas offer agglomeration economies. Therefore, a large and expanding labour force is viewed as attractive to investors.

There are a number of characteristics of a state's tax system that may influence its ability to attract FDI. These include, tax incentives, corporate income tax rates, taxes on capital, taxes on business properties and assets, and personal income tax. We decided to use maximum corporate income tax rates of individual states because this variable is directly related to the level of profit that an investor will make. Higher taxes are expected to discourage FDI.

When analysing Canadian investment in northern New York, Prem Gandhi (1990) concluded that proximity was the most important reason when investors choose a subsidiary location. Based on an examination of Canadian establishments in Western New York, McConnell and MacPherson (1990) agree that physical proximity to the subsidiary was very important in the location decision. These findings are not totally unexpected because each study focussed exclusively on a region that lies close to the economic heartland of Canada. Will similar results occur when applied over the entire United States? It seems reasonable to hypothesise that as the distance from the corporate headquarters increases, the level of FDI will decrease.

For the purpose of this study, distance of the investment is defined as the highway distance from a central node in the province where the investment originated to a central node of the destination state. A central node in a province or state is defined by the city with an abnormally large amount of FDI activity. If more than one city possesses a large percentage of state/provincial FDI activity or a state/province is exceptionally large, two nodes were selected and the average distance was calculated. For example, the distance for FDI activity originating in Ontario destined for California, was calculated as the average of the road distances between Toronto and Los Angeles and Toronto and San Francisco.

Reich (1991) argues that international business is now a collage of global webs, with unfinished products being traded among countries. Enterprises go wherever they can to make the highest profit. These enterprises then import and export raw materials and final products to each other. The variables port and shoreline were chosen to measure the effect of this integration. Since the road and rail systems of the United States are so highly developed we assumed that all states have adequate access to them. A positive association with both port and shoreline suggests that Canadian FDI is directed to states where business operations are well integrated internationally. Port represents the annual foreign tonnage entering all state ports while shoreline is the total shoreline in each state.

More and more, the business decision incorporates the impact that a location will have on the work force and clients. Firms in some industries consider locations that lure and maintain the best workers. To determine the importance of the social environment in the location decision, poverty, which represents the percentage of a state's population below the poverty level, was tested. Increased poverty levels are expected to discourage FDI.

## **Empirical Results**

In the remainder of this paper, an attempt is made to determine why some states are able to attract more investment than others. Using destination specific variables, a logit model is employed to relate the probability of a Canadian FDI coming to a particular state to economic characteristics defined at the state level.

The results for the sample including all observations (A) are displayed in Table 3. All estimated coefficients have the expected sign. The results suggests that FDI is attracted to states with large markets, good accessibility to international inputs and markets, skilled labour, and expanding work forces. On the other hand, unionisation, distance to the Canadian source location, and corporate tax rates have negative impacts on investment location choice (Table

**TABLE 3 Multinomial Logit Model Results**

Variable	Sample A	Sample B	Sample C	Sample D	Sample E	Sample F
BA	0.428E-01*	0.590E-01*	--	--	--	--
High school	--	--	0.313E-01*	0.701E-01*	0.636E-01*	0.593E-01*
Unionization	-0.305E-01*	-0.269E-01*	--	-0.623E-01*	-0.546E-01*	-0.463E-01*
Distance	-0.415E-03*	-0.514E-03*	-0.522E-03*	-0.525E-03*	-0.375E-03*	-0.582E-03*
Max corporate tax	-0.434E-01*	-0.740E-01*	-0.533E-01*	-0.672E-01*	-0.602E-01**	-0.648E-03*
Average pay	-0.547E-04*	-0.538E-04**	--	0.545E-04***	--	--
Population	0.122E-06*	0.133E-06*	0.124E-06*	0.148E-06*	0.120E-06*	0.146E-06*
Per capita income	0.178E-03*	0.102E-03**	--	--	0.105E-03**	--
Port	0.217E-08*	--	--	--	--	0.142E-08*
Employment change	0.521E-02**	--	--	--	--	--
Shoreline	--	0.608E-04*	0.471E-04*	0.601E-04*	--	0.955E-04*
Unemployment	--	--	-0.751E-01**	--	--	--
Log likelihood	-4265.793	-1979.993	-1017.344	-896.954	-614.176	-1311.537
Restricted Log-L	-4981.623	-2285.699	-1138.564	-1054.023	-688.749	-1511.424
Rho-square	0.1437	0.1337	0.1064	0.149	0.1082	0.1322
# obs. in sample	1268	601	317	284	191	410

Note: 1. \* = statistically significant at the .01 level, \*\* = statistically significant at the .05 level, and \*\*\* = statistically significant at the .10 level.

**TABLE 4 Regional Relationships between Canada and the United States - as a Percentage of the Canadian Region's Transactions**

Region	Western Canada	Ontario	Quebec	Maritimes
New England	3.1	7.1	12.1	50.0
Mid East	15.3	30.8	24.8	0.0
Great Lakes	5.1	15.4	13.4	0.0
Southeast	15.3	19.2	28.9	16.7
Plains	3.1	3.3	8.1	0.0
Southwest	15.3	8.3	8.1	16.7
Rocky Mountain	17.3	2.1	1.3	0.0
Far West	25.5	13.8	3.4	16.7

Source: FDI in the United States: Completed Transactions (1974...1995). 3 shows results of the "best" model for each sample, meaning non-significant variables are dropped).

From the geographer's perspective, the finding that distance has an effect on the probability of investment is of particular interest. This can be explained by the fact that border regions between the two countries are well integrated.

This relationship can be both cultural and economical. Similarities in tastes that may extend across the border can result in customers purchasing comparable products. At the same time, firms can build relationships with firms in the foreign country through face-to-face contacts and exchange of goods, so long as distances are not too great. The result is the linking of the firms either vertically or horizontally.

The information in Table 4 confirms this statistical finding. By examining the percentage of the Canadian region's transactions, it illustrates the strong effect that geography has in the FDI location decision. While transactions originating in Western Canada tend to be destined for Western United States, transactions originating in Eastern Canada tend to be destined for Eastern United States. Transactions originating in Ontario and Quebec are generally destined for the Mid-East, Great Lakes Region, as well as the Southeast Region.

### **Results from Restricted Sample**

Results of estimating the logit model on Sample B, which includes only observations for which the value of investment is known, are broadly similar to those estimated on the full sample. The only major difference between the two sets of results is that employment change does not appear as a significant variable in the best model for Sample B and that "Shoreline" rather than "Port" appears as an indicator of access to international trade. Thus, at least for the purpose of estimating the multinomial logit model, there is no evidence that working with the restricted sample (B) profoundly affects the results.

### **Results by Type of Investment**

Samples A and B group a number of diverse forms of FDI including new plants, joint ventures, real estate, and acquisition/mergers. This aggregation provides a suitably large sample size, however different types of FDI could react differently to various circumstances. Friedman et al (1996) argue that the location characteristics of potential sites are most important when an investor is locating a new plant. After initially deciding to make a foreign investment, all characteristics of potential sites that affect profit levels are considered before locating a subsidiary. Conversely, when management decides to merge with or acquire a firm, site characteristics may play a less significant role.

To address this, Sample B was separated into two groups. Sample C, with 316 observations, includes all FDI that are either acquisitions or mergers. Sample D, with 285 observations, includes all FDI that are new plants, joint ventures, or real estate investments. Logit model results for Sample C and Sample D are shown in Table 3. The main difference is that neither unionisation nor average pay is significant for sample C. This suggests that labour force

characteristics are less important to an investor who is buying into or going through a merger or acquisition.

When simply analysing the sign of the significant coefficients, no difference is evident between results for the two samples (nor, for that matter, between them and the results for Samples A and B). A difference of means test was conducted on the best logit models of Sample C and Sample D to determine whether the magnitudes of the estimates are significantly different.<sup>4</sup> The outcome reveals statistically significant differences between the parameters on population and maximum corporate tax rates in the two sub-samples, both of which are higher for Sample D.

The differences observed between the two samples appear to support an argument put forth by Friedman, Fung, Gerlowski and Silberman that “the decision to merge with, or to acquire another firm is often primarily based on market power with little emphasis on location” (Friedman et al 1996: 367). Thus, spatially variant cost factors are less important for acquisitions and mergers.

### **Size of Investment**

The results reported for Sample A,B,C and D are obtained by combining investments that vary significantly in dollar value. While it is interesting to examine the number of investments going to each state, it is also important to consider the relative sizes of those investments. Certainly an investment of 100 million dollars will have a greater impact than an investment of 1 million dollars. Thus it is important to know whether the factors attracting Canadian investment to U.S. states vary with the size of investment. Also, while it is not certain that small firms make small investments and large firms make large investments, this is likely the case. Thus, separating the data by size of investment may yield some insights about the spatial investment behaviour of small vs. large firms. To address this issue, Sample B was separated into large investments (Sample E) and small investments (Sample F).

The best logit models for small investments and large investments are provided in table 3.<sup>5</sup> An immediately evident difference is that both Port and Shoreline are significant in sample F while neither are significant in Sample E. This suggests that access to international inputs and markets (which these variables are included to capture) is greater for small investments. On the other hand, per capita income (a local market indicator) is only significant for large

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4. The point estimate is taken as the mean with a normal distribution defined by its standard error. Since such a comparison should be made across identical specifications, the test is applied to both the best model for Sample C and the best model for Sample D.

5. There were not sufficient observations to separate the observations simultaneously by type and size, thus Samples C and D are for all types combined.

investments. A tentative interpretation is that large investors tend to be more interested in exploiting regional U.S. markets, while small investors are more interested in using a U.S. presence as a springboard to reaching international inputs and markets.

A difference of means test on the logit model parameter estimates was used to determine if the magnitude of influence differs between small and large investments for those variables that are significant for both samples.<sup>6</sup> The variables distance, population, and high school were found to be statistically different between large and small investments at the .01 significance level.

The results suggest that the effect on utility of distance from the source of the investment to its destination state is greater for small investments than large ones. This may occur because a small Canadian company may want greater control over their American operations. A close proximity would allow the manager to travel easily between Canadian and American operations resulting in greater information and a decrease in transaction costs. In addition, it may be more difficult to justify the high cost of travel on the part of managers to oversee distant operations. However, for larger investments the added travel costs are not viewed as a deterrent to investing. Finally, since the economic heartland of Canada and the United States are relatively close, motivation for small investments could also be to access a large market.

An alternative explanation for the difference in distance could be that large investments experience a greater attraction to natural resources. If a firm is interested in expanding its resource base through FDI, the location decision is extremely dependent upon the supply of existing reserves. If a resource can only be secured at a greater distance from headquarters, the firm is less likely to consider distance as an impediment.

The estimated co-efficient on population was statistically different between large and small investments, with a greater value for the latter. The difference of means test reveals a significant difference between large and small investments for the variable high school, with a greater value for the former. A possible explanation could be that a large number of skilled workers are of lesser importance for many small investments that are based primarily on setting up a sales office to access large regional markets.

## Conclusion

The intention of this analysis was to uncover those factors that attract Canadian FDI to different parts of the United States from 1974 to 1994. A multinomial logit model was used to test variables that summarised the economic, political, and social attractiveness of each state in the United States. Results indicate that

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6. Again the comparison was made across identical specifications.



FDI was drawn towards large local markets, increased accessibility to international inputs and markets, skilled labour, and expanding work forces. On the other hand, unionisation, distance from the source of investment, and high corporate tax rates have negative impacts.

In order to explore these results further, the data set was disaggregated to see how the impacts of these factors vary across different categories of investments. First, separate analyses are conducted on a set of investments representing acquisitions and mergers and a second set representing new plants, joint ventures, and real estate investments. We found that the former are less affected by a number of spatially variant cost factors such as labour market conditions and taxes. The implication is that a Canadian firm is less concerned with traditional factors affecting profitability if it is buying into an enterprise that has already established itself in the American market.

Finally FDI in the United States was separated into large investments and small investments. Both large and small investments are attracted to large markets with skilled labour forces and discouraged by unionisation, high taxes, and long distances. The appeal of accessibility to international inputs and markets, however, appears to be limited to small investments. Comparing the magnitudes of significant influences, large investments were more strongly attracted by labour with high skills. On the other hand, small investments were more strongly attracted to states with large populations. The negative effect of distance was greater for small investments than for large investments.

By using the multinomial logit model, this paper presents two further avenues for research on Canadian FDI abroad. First, this paper has expanded research on pull factors of Canadian FDI abroad. Alternatively, future research could explore the first condition of Dunning's Eclectic Paradigm, ownership advantages. The multinomial logit model would be useful to determine those characteristics that provide Canadian firms a competitive edge when investing internationally. Further along this avenue, a nested multinomial logit model could be used to simultaneously estimate the effect of push factors and pull factors on the volume and regional distribution of Canadian FDI.

A second research avenue would be to examine changing priorities among location factors for FDI over time. By comparing FDI from one time period to another, insight can be obtained into those characteristics that attract FDI. For example, is accessing the American market becoming more attractive to Canadian investors over time? Using a multinomial logit model, we set out to accomplish this goal through interaction variables. Unfortunately, limitations with respect to the sample did not allow for effective results. As data become more comprehensive, the multinomial logit model should be used as a complimentary tool to qualitative research. Studies similar to Development Counsellors International's most favourable business climate reveal characteristics that make a state appealing to investment (Levine 1999). Through the use of both qualitative and quantitative research, policy makers can then become more aware of those factors that increasingly attract investment.

## References

- Beeson, P.E. and S. Husted. 1989. "Patterns and Determinants of Productive Efficiency in State Manufacturing". *Journal of Regional Science*, 29: 15-28.
- Ben-Akiva, M. and S.R. Lerman. 1985. *Discrete Choice Analysis*. Cambridge: Massachusetts Institute of Technology Press.
- Carlton, D.W. 1983. "Why New Firms Locate Where They Do: An Econometric Model With Discrete and Continuous Endogenous Variables". *Review of Economics and Statistics*, 65: 440-449.
- Cooke, W.N. 1997. "The Influence of Industrial Relations Factors on U.S. Foreign Direct Investment Abroad". *Industrial and Labour Relations Review*, October: 3 17.
- Coughlin, C. C., J. V. Terza, and V. Arromdee. 1991. "State Characteristics and the Location of Foreign Direct Investment within the United States". *Review of Economics and Statistics*, 73: 675-683.
- Dunning, J.H. 1991. *Explaining International Production*. HarperCollins Academic: London.
- Eden, L. 1993. "Bringing the Firm Back in: Multinationals, International Political Economy", in L. Eden and E. Potter (eds.). *Multinationals in the Global Political Economy*.
- Friedman, J., H.-G. Fung, D.A. Gerlowski and J. Silberman. 1996. "A Note on State Characteristics and the Location of Foreign Direct Investment within the United States". *Review of Economics and Statistics*, May: 367-368.
- Ghandi, P.P. 1990. "The Free Trade Agreement and Canadian Investment in Northern New York". *Canadian Journal of Regional Science*, Summer/Autumn: 205-220.
- Glickman, N.J. and D.P. Woodward. 1988. "The Location of Foreign Direct Investment in the United States: Patterns and Determinants". 11: 137-154.
- Knubley, J., W. Krause, and Z. Sadeque. 1991. "Canadian Acquisitions Abroad: Patterns and Motivations", in L. Waverman (ed.). *Corporate Globalization Through Mergers and Acquisitions*. Calgary: University of Calgary Press.
- Levine, A. 1999. "Marketing your Community for Economic Development: Trends and Insights from the Boardroom". *Public Management*, 81: 6-10.
- Litvak, I. and C. Maule 1981. "Canadian Multinationals in the Western Hemisphere". *Business Quarterly*, 40: 30-42.
- McConnell, J.E. and A. D. MacPherson 1990. "Canadian Establishments in Western New York: Some Preliminary Findings". *Canadian Journal of Regional Science*, Summer/Autumn: 189-204.
- Meyer, S.P. and M. B. Green. 1996. "Outward Canadian Direct Investment and Place Specific Attributes: an Empirical Analysis". *Geoforum*, 27: 225-245.
- Rao, S., M. Legault and A. Ahmad. 1994. "Canadian Based Multinationals: An Analysis of Activities and Performance", in S. Globerman (ed.). *Canadian*

- Based Multinationals*. Calgary: University of Calgary Press.
- Reich, R. 1991. *The Work of Nations*. Knopf: New York.
- Rugman, A. 1987. *Outward Bound: Canadian Direct Investment in the United States*. Toronto: C.D. Howe Institute.
- Statistics Canada. 1997. *Canada's International Investment Position 1997*, Cat. No. 67-202. Ottawa: Supply and Services Canada.
- Train, K. 1986. *Qualitative Choice Analysis*. Cambridge: Massachusetts Institute of Technology Press.
- U.S. Department of Commerce. 1984...1995. *Foreign Direct Investment in the United States, Completed Transactions 1974-1994*. Washington, DC.: US GPO.
- Vertinsky, I. and R. Raizada. 1994. "MacMillan Bloedel: Foreign Investment Decisions and their Welfare Consequences", in S. Globerman (ed.). *Canadian Based Multinationals*. Calgary: University of Calgary Press.