

***USING MULTINOMIAL LOGISTIC REGRESSION  
OF POLITICAL AND ECONOMIC RISK VARIABLES  
FOR COUNTRY RISK ANALYSIS OF FOREIGN  
DIRECT INVESTMENT DECISIONS***

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**ABSTRACT**

In this paper, we use multinomial logistic regression to allow a multinational corporation to categorize countries based on political risk and economic risk. We discuss the need for country risk analysis, methods of defining country risk, and research evaluating country risk services. We use gross national income and the index of economic freedom as measures of financial and political risk to develop a multinomial logistic regression model to evaluate the probability that a country possesses favorable investment characteristics or foreign direct investment.

**INTRODUCTION**

This paper illustrates a practical and easily applied model, based on political and economic risk variables, which can be used by multinational corporations to identify the riskiness of foreign direct investment in specific countries. The theoretical basis for this model is taken from Krayenbuehl [6]. Krayenbuehl develops a twodimensional model of country risk analysis. Krayenbuehl's model allows a multinational corporation to assess the financial and political risks of countries and allows the multinational corporation to determine the probability that each country is acceptable for each specific foreign direct investment on an ongoing basis. This paper extends Krayenbuehl's work by demonstrating how multinational corporations can use multinomial logistic regression analysis to bring country risk analysis in-house, thus, removing the need to purchase information from outside consultants and services and allowing the corporation to tailor the analysis to company specific needs.

Over the last 20 years, there has been an increase in the amount of foreign direct investment overseas. U.S. foreign direct investment abroad grew from \$207.8 billion in 1982 to \$1,381.7 billion (valued at historical cost) in 2001 at an annual growth rate of 10.5% (Borga and Yorgason [3]). In 2001, U.S. foreign direct investment was largest in the United Kingdom at \$249.2 billion or 18% of total U.S. foreign direct investment, followed by foreign direct investments in Canada and the Netherlands at \$139.0 billion and \$131.9 billion respectively or 10% and 9.5% of the total U.S. foreign direct investment, (Borga and Yorgason [3]). While most U.S. foreign direct is in countries in Europe and North America, the amount of foreign direct investment in emerging markets has recently experienced substantial growth.

The advantage of being an early entrant into an emerging market is advantageous for a corporation. Such market power may yield monopolistic profits resulting from new sources of demand, acquisition of cheaper raw materials, and economies of scale.

From 2001 to 2002, U.S. foreign direct investment in industrialized countries grew at a rate of about 8%. The largest growth, however, was in countries classified as emerging market countries. Growth in U.S. foreign direct investment in Africa and the Middle East exceeded 10%, although the absolute dollar amount invested still remains small (Borga and Yorgason [3]). This trend provides evidence for the need for multinational corporations to have access to a reliable model for predicting country risk as the risks of entering a new foreign market directly are not only higher, but are also more difficult to forecast.

### **COUNTRY RISK**

Obtaining reliable and accurate forecasts of country risk are of great importance to any multinational corporations. Country risk relates to the likelihood that changes in a foreign business environment will occur and will reduce the profitability of an overseas foreign direct investment. There are two main component of country risk that investors need to be concerned with are political risk and financial risk of a country.

Butler and Joaquin [4] define political risk 'as the risk that a sovereign host government will unexpectedly change the "rules of the game" under which businesses operate. They show how political risk can change the future cash flows of a foreign direct investment and how political risk can be reflected in the required rate of return. Political risk refers to the risk that the politics within a country will negatively affect a multinational's foreign direct investment in that country.

Political risk can result from political change due to elections, revolts, recessions, or wars. These political changes and the resultant political risk can lead to expropriation, higher taxes or tariffs, reduced foreign direct investment incentives, local ownership requirements, local content requirements, or currency inconvertibility. The result can be the loss of assets, the termination of operations, reduced after-tax income, higher import costs, reduced revenue, management restrictions, higher operational costs, or an inability to repatriate funds. Macro-economic mismanagement by the government can lead to higher inflation and higher interest rates leading to higher costs, planning difficulties, and higher interest costs. Other types of political difficulties such as labor unrest or strikes can lead to higher production costs and production interruptions.

Not only do multinational corporations need to assess the future risks to a foreign direct investment from political risk, but a country's current financial and economic situation greatly affects the ability of a multinational corporation to earn profits from a foreign direct investment. There are two types of economic factors to be considered: macro-economic factors and micro-economic factors. Macro-economic factors include fluctuations in a country's inflation rate, exchange rate, tax rate, and interest rates, while micro economic factors include demand for a firm's products, the availability of local labor, local wage rates, and employment laws.

It is important that multinational corporations planning to invest overseas be able to forecast accurately country risk to protect their foreign direct investments. Firms usually use two approaches. Either the firms purchase country risk information

from a service and/or the firms attempt to do an in-house forecast. When firms purchase a service they give up the ability to have the forecasts reflect their specific situations. Services give general ratings of country risks. No specific industry or firm information is reflected in the analysis. If firms could tailor country risk analyses to their specific foreign direct investment characteristics they would be able to ascertain foreign direct investment risk with less uncertainty.

Erb, Harvey, and Viskanta [5] describe country risk using five measures – political risk, economic risk, financial risk, a composite risk, and a country credit rating. The first four measures are from *Political Risk Services' International Country Risk Guide* (CRG) and the fifth is from *Institutional Investor*. Their work explores the information content of these risk measures in predicting future expected stock returns. Their results found that while all the country risk measures were correlated with each other, financial risk measures contain the most information about future stock returns and political risk measures contain the least information about future stock returns.

EHV's findings support the use of political and economic risk analysis by multinational corporations as investors interested in foreign stock market returns can benefit from the use of country risk services. Multinational corporations considering foreign direct investments of the bricks and mortar type need to be able to forecast the effect of future political events as well as financial or economic events on their foreign direct investments. Using multinomial logistic analysis of political and economic risk variables will enable a corporation to assess this risk for a specific project while discriminating between a numbers of countries.

## **COUNTRY RISK ANALYSIS**

Krayenbuehl [6] develops a two dimensional matrix for political and economic risk analysis. Political risk results from a number of factors. The constitutional environment reflects both the presence of a constitution and that the constitution is enforced. The presence of effective political parties indicates the presence of a strong government and a democratic environment. The quality of government reflects the extent to which the elected officials or interest groups and the bureaucracy run the government. The management of government crises is a factor in political risk reflecting the likelihood of military interference or government inaction from stalemates. Foreign policy affects political risk to the extent that it reflects the extent to which a government is tied to other particular governments or blocs. The extent of government involvement in the economy in that government enterprises crowd out non-government enterprises. Social structures are important factors in political risk in that income or social inequalities lead to government crises. Demographic structures affect political risk as urban versus agricultural needs may be different. Ethnic and religious differences among groups within a country can lead to political unrest. The extent to which labor relations are unstable or formalized affects political risk. Legislation toward foreign direct investment affects foreign direct investment.

Political risk resulting from these factors can lead to internal turmoil, rebellion or civil war, revolution, and corruption. Each of these factors leads to more political uncertainty and higher costs of doing business. Krayenbuehl posits five levels of political risk: extremely high risk, high risk, medium risk, low risk, and very

low risk. Krayenbuehl argues that the trade-off may be that in low risk countries competition is high. That is, as political risk increases, the number of multinational corporations willing to enter the environment decreases, making monopoly profits higher, but more risky.

For example, Krayenbuehl develops a measure of political risk sensitivity to literacy. In the Krayenbuehl model, the sensitivity to political risk indicator,  $I_i$ , is related to a measure of literacy,  $A$ , divided by GNP per capita,  $B$ ,  $I_i = (A/B)$ . A country with a high literacy rate and unequal distribution of income will have a discontent population and political instability. A country with a high literacy rate and equal income distribution will have a content population and political stability. A country with a low literacy rate and with unequal income distribution will have a content population (ignorance is bliss) and political stability. By graphing these two variables, one can group countries from high to low political risk. A second sensitivity to political risk indicator,  $I_j$ , is related to a measure of literacy,  $A$ , divided by GNP per capita,  $B$ , multiplied by a measure of income distribution,  $C$ ,  $I_j = (A/B)*(C)$ .

Economic risk is influenced by inflation, foreign exchange policy, economic policy, the use of foreign funds, the terms of trade, natural resources, tariff policies, the management of foreign debt, capital policies, trade barriers, commodity prices, interest rates, natural catastrophes, transportation, market conditions, and soft loans. Measures of economic risk would be debt service ratio (debt service obligations divided by foreign exchange earning), debt to GNP ratio (external public and private debt divided by GNP), interest service ratio (interest obligations divided by export earnings), reserves to imports ratio, liquidity gap ratio, current account balance to GNP ratio, growth of exports ratio, the compressibility ratio. Krayenbuehl uses multinomial logistic regression analysis to develop prediction models of default. Krayenbuehl suggests that country risk analysis should be an ongoing process.

In this paper, we show how to conduct country risk analysis using multinomial logistic regression analysis. Political risk is measured using the index of economic freedom. Financial risk is measured using gross national income. These measures are used with multinomial logistic regression analysis to determine the probability countries that are acceptable for foreign direct investment or that countries are unacceptable foreign direct investment.

## **COUNTRY CREDIT RATINGS**

The country ratings used in this study are reported by the World Bank [9], which publishes country credit ratings from a number of sources. The country credit ratings used in this study are from *Euromoney* which reports country credit ratings twice a year, March and September. The following discussion is taken from *Euromoney*, September 2002, pages 207-214. Country credit ratings are from zero to one hundred with one hundred representing less risk. The overall country credit risk score is a weighted average of nine variables. For each category, the highest rated country is given the full variable value and the lowest rates country is given a value of zero. Intermediate countries are given a value equal to  $[A-(A/(B-C))*(D-C)]$  where  $A$  is the category weighting,  $B$  is the lowest value,  $C$  is the highest value, and  $D$  is the individual value. For example, debt indicators represent ten percent of the index value. If the highest value is nine and the lowest value is one, the country with the

nine would receive ten points and the country with one would receive zero points. A country with a rating of five would receive  $[10-(10/(1-9))(5-9)]=5$ . The overall country credit rating is the sum of the nine weighted indices.

Political risk, with a weight of 25 percent, measures the likelihood of non-payment of financial obligations with countries rate from ten of zero with a higher rating indicating less political risk. Economic performance, also 25 percent, is based on GNI per capita (Atlas method) and a poll of economic forecasts with both factors weighted equally. Debt indicators, debt default or rescheduled debt, and credit ratings each have weights of ten percent. Debt indicators are a weighted average of total debt to GNP (A), debt service to exports (B), and current account balance relative to GNP (C). The Debt indicator value is equal to  $A+2B+10C$ . The debt default value is the proportion of debt in default to total debt. OECD counties receive a rating of ten and developing countries that do not provide complete debt reports are rated zero. Credit ratings are based on ratings of bond rating agencies. Access to bank finance, access to short-term finance, access to capital markets, and discount on forfeiting are each weighted five percent. Access to bank financing is measured as loans to GNP. As with the debt indicator, OECD countries are rated five and non-reporting developing countries are rated zero. Both access to short-term finance and access to capital markets are rated by experts from zero to five. Discount on forfeiting is measured by the average, maximum tenor for forfeiting and the average spread over riskless countries. Countries where forfeiting is not available receive a rating of zero.

#### **GROSS NATIONAL INCOME**

World Development Indicators [9, p.186] indicates that countries with higher levels of gross national income have lower levels of poverty. Increasing the growth rate of gross national income has a dramatic effect, for example, China has increased gross national income per capita by sevenfold over the last forty years with a growth rate of six percent per year while Malawi has only increased gross national income per capita by fifty percent with a growth rate of only one percent per year. Even though developing countries have higher percentage savings rates that developed countries the amounts saved by developing countries are small and the developing countries supply the bulk of worldwide savings. In 1999, total gross domestic savings worldwide was \$30.9 billion of which \$24.3 billion (79%) was provided by the high income economies. Even with high savings rates, developing countries cannot save enough capital to meet foreign direct investment needs.

The World Bank, in "*Estimation of Internationally Comparable Per Capita Income Numbers for Operational Purposes*," categorizes countries by gross national income per capita measured in United States dollars to determine lending terms to countries in a transparent fashion. Lower income countries receive better lending terms with respect to such items as grace and repayment periods, fees, and interest rates. The World Bank uses gross national income per capita as a proxy for economic well being. In the technical notes to the World Bank Group – Data and Statistics, numerous measures of economic well being exist such as sanitation facilities, malnutrition, telephones, life expectancy, paved roads, stock market capitalization, literacy rate, and infant mortality rate, all of which variables are highly correlated with gross national income per capita.

Countries are divided into four categories: lower income economy, lower middle income economy, upper income economy, and high income economy. Gross national income (formerly gross national product) is a measure of the income created by the residents of a nation from both international and domestic activities. Gross domestic product measures the income generated in an economy by both residents and non-residents of an economy. Gross national income per capita is converted from domestic currency to dollars using the Atlas conversion method. The Atlas conversion factor is the arithmetic average of the current foreign exchange rate and the foreign exchange rate for the two previous years adjusted for the ratio of the domestic price level change and the dollar price level change. Alternative methods of determining foreign exchange rate conversion factors, such as the purchasing power parity method, are not used by the World Bank because of concerns about “methodology, quality, timeliness, and geographic coverage.” That is, sufficient information is not available for every country.

### **THE INDEX OF ECONOMIC FREEDOM**

The index of economic freedom is a broad based measure of economic openness published by the Heritage Foundation. Economic freedom is defined as “the absence of government coercion or constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for the citizens to protect and maintain liberty itself.” The index of economic freedom is an equally weighted index of ten factors.

Factor one relates to trade policy and is measured by the average tariff rate, non-tariff barriers, and corruption in the customs service. Factor two is the Fiscal Burden of the Government and is measured by the top income tax rate, the average tax rate, the top corporate tax rate, and government expenditures. The third factor measures government economic intervention and is measured by government consumption as a percent of the economy, government ownership of business and industries, share of government revenues from state-owned enterprises and government ownership of property, and economic output produced by the government. Factor four measures monetary policy and is measured by the ten year average inflation rate. Factor five measures capital flows and foreign investment. Restrictions on capital flows and foreign direct investment are measured by foreign direct investment code, restrictions on foreign ownership of business, restrictions on the industries and companies open to foreign investors, restrictions and performance requirements on foreign companies, foreign ownership of land, equal treatment under the law for both foreign and domestic companies, restrictions on the repatriation of earnings, and availability of local financing for foreign companies.

Factor six measures the openness of the banking and finance sector and are measured by government ownership of banks, restrictions on the ability of foreign banks to pen branches and subsidiaries, government influence over the allocation of credit, government regulations, and freedom to off all types of financial services, securities, and insurance policies. Factor seven measures wages and prices and is measured by minimum wage laws, freedom to set prices privately without government influence, government price controls, the extent to which the government uses price controls, and government subsidies to businesses that affect prices. Factor eight relates to property rights and is measured with seven variables and is measured

by freedom from government influence over the judicial system, the commercial coded defining contracts, sanctioning of foreign arbitration of contract disputes, government expropriation of property, corruption within the judiciary, delays in receiving judicial decisions, and legally granted and protected private property. Factor nine relates to government regulation and is measured by licensing requirements to operate a business, ease of obtaining a business license, corruption within the bureaucracy, labor regulations, environmental, consumer safety, and worker health regulations, and regulations that impose a burden on business. Factor ten is based on the black market and is measured by smuggling, piracy of intellectual property in the black market, agricultural production supplied on the black market, manufacturing production supplied on the black market, services supplied on the black market, transportation supplied on the black market, and labor supplied on the black market.

Countries are rated on each of the ten factors from one to five with one being most free and five being most restrictive. The overall score is an equally weighted average of the ten factors. Countries with scores from one to two are free. Countries with scores from four to five are economically restrictive. The overall score is used as one of the multinomial logistic regression independent variables.

Roll and Talbot [8] analyze the determinants of wealth over the period 1995 to 1999 for 162 countries. Roll and Talbot find that variation in GNI per capita is explained by nine different measures of economic openness – property rights, political rights, civil liberties, press freedom, and government expenditures positively influence gross national income per capita. Gross national income per capita was negatively influenced by excessive regulation, poor monetary policy, black market activity, and trade barriers. In addition, Roll and Talbot find that positive democratic events are followed by increases in growth in gross national income per capita in those countries and that negative democratic events are followed by decreases in growth in gross national income per capita in those countries.

## **RESEARCH DESIGN**

To determine the value of using gross national income and the index of economic freedom as predictor variables for country risk analysis, we use multinomial logistic regression. When the dependent variables in a study are discrete, in this case equaling either one, two or three, ordinary least squares regression is not appropriate. Multinomial logistic regression is designed specifically to determine the probability that a discrete variable belongs to a specific group. Countries that are appropriate for foreign direct investment are given a value of one and countries that are not appropriate for foreign direct investment are given a value of three while uncertain countries are given a value of two. The independent variables, gross national income and index of economic freedom, are used to develop the multinomial logistic regression prediction model. The beta coefficient of the multinomial logistic regression model provides information about the probability that a particular observation belongs to the group of countries that are acceptable for foreign direct investment or to the group of countries that are not acceptable for foreign direct investment.

In order to make the beta coefficients more comparable, a linear transformation is applied to each of the independent variables. Gross national income

is divided by 1000 to convert the values to thousands between \$34.87 thousand and \$0.54 thousand. The index of economic freedom is multiplied by 10 to convert it to a range of 13 to 47. As a preliminary step, we run three ordinary least squares regressions. Model 1 includes both the gross national income and the index of economic freedom as independent variables. Model 2 is an ordinary least squares regression with only gross national income as an independent variable. Model 3 is an ordinary least squares regression with the index of economic freedom as an independent variable.

### EMPIRICAL RESULTS

Table 1 contains the sample statistics and correlation matrix. The country credit ratings range from a high of 98.2 for Switzerland to a low of 20.7 for Guinea-Bissau. For the first group, country credit rating averages 91.8 with a range from 98.2 (Switzerland) to 87.5 (Italy). For group two, country credit rating averages 62.1 and ranges from 85.2 (New Zealand) to 50.6 (Lithuania). Group three country credit ratings average 32.8 with an range from 49.1 (El Salvador) to 20.7 (Guinea-Bissau).

**Table 1**  
**Summary Statistics**  
**Country Risk Ratings**

	CCR	PPP	IEF
Average	49.4	8.7	30.0
Standard Deviation	23.2	9.0	7.0
Maximum	98.2	34.9	47.0
Minimum	20.7	0.5	13.0
Range	77.5	34.3	34.0
Count	128	128	128
Correlation matrix	CCR	PPP	IEF
Correlation matrixCCR	1.00	0.94	-0.77
PPP	0.94	1.00	-0.73
IEF	-0.77	-0.73	1.00

CCR – Euromoney Country Credit Ratings  
 PPP- Gross National Income – Purchasing Power Parity Method  
 Index of Economic Freedom

The gross national income ranges for a high of \$34,870 for the United States to a low of \$540 for Tanzania and Republic of the Congo with an overall average value of \$8,671 with a standard deviation of \$9,011. For the first group, acceptable foreign direct investment risk, the mean value for gross national income is \$26,809 with a standard deviation of \$3,125. For the second group, uncertain foreign direct investment risk, the mean value for gross national income is \$10,775 with a standard deviation of \$5,589. For the third group, unacceptable foreign direct investment risk, the mean value for gross national income is \$3,122 with a standard deviation of \$2,309.

The values of the index of economic freedom range from one to five with one representing a high degree of economic freedom and five representing a low degree of economic freedom. The index of economic freedom ranges from a low of 1.30 for Hong Kong to a high of 4.65 for Laos with a mean value of 3.00 with a standard deviation of 0.70. For the first group, the mean value for the index of economic freedom is 2.04 with a standard deviation of 0.26. For the second group, the mean value for the index of economic freedom is 2.69 with a standard deviation of 0.53. For the third group, the mean value for the index of economic freedom is 3.38 with a standard deviation of 0.53.

The Wilks' lambda to test the equality of group means is 0.155 for the gross national income variable and 0.494 for the index of economic freedom variable. Both are statistically significant at the 0.00 percent level indicating that the group means are statistically significantly different. The correlation coefficient between the gross national income and the index of economic freedom variable is  $-0.73$ . These results indicate that the group means are slightly negatively correlated. Note that the index of economic freedom indicates more economic freedom with lower ratings and the gross national income indicates more income at higher levels. Thus, the negative correlation implies that more economic freedom is associated with higher gross national income. Thus, the variables should be independently useful to differentiate the group means. The correlation coefficient between country credit rating and gross national income is 0.94 and the correlation coefficient between country credit rating and the Index of Economic Freedom is  $-0.77$ .

Table 1 provides the summary statistics and the correlation matrix for the variables. The average country credit rating is 72.8 with a standard deviation of 18.9 and a range from 39 to 96. There are twenty-two countries in the group of countries that are acceptable for foreign direct investment and eighteen countries in the group of countries that are not acceptable for foreign direct investment. Gross national income values average \$15.0 thousand with a standard deviation of \$12 thousand and a range from a high of \$38.1 thousand to a low of \$507. Index of economic freedom has an average value of 13.0 with a standard deviation of 57 and a range from 13 to 38. Country credit rating is positively with gross national income and negatively correlated with the index of economic freedom. Gross national income and the index of economic freedom are negatively correlated. Keep in mind that gross national income and country credit ratings go from high to low while group and the index of economic freedom go from low to high. The actual signs of the correlation coefficient can be changed simply by reversing the values of the variables.

Table 2 provides the ordinary least square regression results for three models. Model 1 contains both independent variables – gross national income and the index of economic freedom. The beta coefficient for the gross national income variable is 2.06 with a t-statistic of 18.73 and the beta coefficient of the index of economic freedom variable is  $-0.61$  with a t-statistic of  $-4.33$ . The adjusted  $R^2$  for the Model 1 regression is 0.89 with an F-ratio of 525, significant at the 0.00 level. Model 2 is the ordinary least squares regression with the gross national income variable as the only dependent variable. The beta coefficient for the gross national income variable is 2.41 with a t-statistic of 30.05. The adjusted  $R^2$  for the Model 2 regression is 0.88 with an F-ratio of 903, significant at the 0.00 level. Model 3 is the ordinary least squares regression with the index of economic freedom variable as the only dependent variable. The beta coefficient for the index of economic freedom

variable is  $-2.54$  with a t-statistic of  $-13.6$ . The adjusted  $R^2$  for the Model 3 regression is  $0.59$  with an F-ratio of  $185$ , significant at the  $0.00$  level. The ordinary least squares regressions indicate that the independent variables are capable of predicting the country credit ratings.

**Table 2**  
**Linear Regression**  
**Country Risk Ratings**

	PPP/IEP	PPP	IEF
Intercept	49.83	28.47	125.64
t-stat	9.93	28.46	21.82
Beta (PPP)	2.6	2.41	
t-stat	18.73	30.05	
Beta (IEF)	-0.61		-2.54
t-stat	-4.33		-13.60
Adj R@	0.89	0.88	0.59
F	525	903	185
Significance	0.00	0.00	0.00

PPP/IEF – includes both independent variables  
 PPP- includes GNI only  
 IEF – includes Index of Economic Freedom only  
 CCR – Euromoney Country Credit Ratings  
 PPP- Gross National Income – Purchasing Power Parity Method  
 Index of Economic Freedom

Table 3 shows the results of the multinomial multinomial logistic regression. For Group 1, the betas coefficient for the gross national income variable is  $2.14$  and the Wald statistic is  $4.60$  and the beta coefficient for the index of economic freedom variable is  $0.54$  with a Wald statistic of  $1.03$ . The constant is  $-49.28$  with a Wald coefficient of  $2.24$ . For Group 2, the betas coefficient for the gross national income variable is  $0.57$  and the Wald statistic is  $19.0$  and the beta coefficient for the index of economic freedom variable is  $0.12$  with a Wald statistic of  $3.43$ . The constant is  $-0.47$  with a Wald coefficient of  $0.05$ . The  $\text{Chi}^2$  for the model is  $171$  and the  $-2$  log likelihood ratio is  $243$ , indicating the efficacy of the model. The Cox-Snell  $R^2$  is  $0.74$ , the Nagelkerke  $R^2$  is  $0.87$ , and the McFadden  $R^2$  is  $0.71$ . The overall classification results indicate that the model correctly classified  $117$  ( $91.4\%$ ) of the  $128$  countries.

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Table 3 Logistic Regression Results Country Risk Ratings					
Group 1	Value	Wald	Significance	df	
Beta (PPP)	2.11	4.46	0.04	1	
Beta (IEF)	0.49	0.85	0.36	1	
Intercept	-47.52	2.08	0.15	1	
Group 2	Value	Wald	Significance	df	
Beta (PPP)	0.54	17.43	0.00	1	
Beta (IEF)	-0.17	5.86	0.02	1	
Intercept	1.29	0.32	0.57	1	
Model Fitting Information	-2 Log Likelihood	Chi2	Df	Significance	
Model	244.36				
Intercept only					
Final	71.05	173.30	4.00	0.00	
Cox-Snell R2	0.74				
Nagelkerke R2	0.88				
McFadden	0.71				
Likelihood Ratio Tests	-2 Log Likelihood of Reduced Model	Chi 2	Significance		
Effect					
Intercept	83.46	12.41	0.00		
PP	146.53	75.475	0.00		
IEF	81.88	10.823	0.00		
Classification Results	Predicted				
Actual	Group 1	Group 2	Group 3	Correct (%)	
Group 1	18	1	0	94.7%	
Group 2	1	28	6	80.0%	
Group 3	0	2	72	97.3%	
Overall	19	31	78	92.2%	
	14.8%	24.2%	60.9%		

### SUMMARY AND CONCLUSIONS

Foreign direct investment has become increasingly important for multinational corporations. The level of foreign direct investment by US multinational corporations outside of the United States and by non-US multinational corporations into the United States has increased. The need for political and financial/economic risk analysis has increased as well. Although some regions of the world have reduced barriers to foreign direct investment, other regions of the world have become increasingly hostile to foreign direct investment. Although country risk assessment services are available, these services provide general ratings rather than ratings specific to the actual project being considered by the multinational corporation.

Political risk is the result of changes in the environmental circumstances for the multinational corporation. Although political risk generally results from governmental action, social factors can cause the environment to change. In either case, less political risk is desirable for the multinational corporation. Financial/economic risk results from changes in either the macro-economic or micro-

economic environment. Multinational corporations need to be able to determine which countries provide the best economic conditions for the production and sale of the multinational corporation's products or services.

The Krayenbuehl [6] country risk assessment model provides a framework in which to analyze the combination of political risk and financial/economic risk. In this paper, we use multinomial logistic regression to use political risk and financial/economic risk to construct a model to evaluate the acceptability of specific country for a specific project under review. The model allows the multinational corporation to divide the countries under consideration into countries that are acceptable for foreign direct investment, countries that are unacceptable for foreign direct investment, and countries that require further analysis. Overall, the country risk analysis process allows the multinational corporation to focus attention on foreign direct investment environments with higher likelihood to success.

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