

USING THE COUNTRY CREDIT RATING MODEL

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THE MULTINATIONAL CORPORATION

The objective of corporate financial management is to maximize the value of the firm. The value of the firm is the market capitalization of the firm, that is, the number of shares outstanding multiplied by the price per share. The value of the firm is determined by the risk and return characteristics of the firm. Firms that want to earn higher rates of return must be willing to assume greater levels of risk and firms that want to have lower levels of risk must be willing to accept a lower rate of return. The risk and return characteristics of the firm are determined by the investment and financing decisions made by the corporate financial managers.

The process that multinational corporations use to make long-term asset decisions is called capital budgeting. Farragher, Kleiman, Sahu (1999) define an eight step capital budgeting process. Stage one involves strategic analysis – determining areas in which the firm has a competitive advantage, Porter(1980) and Myers (1987). Stage two involves determining investment goals – minimum required rates of return and maximum levels of risk for investments. Stage three is the process of finding investment opportunities. Stage four is forecasting future cash flows from projects. Stage five is determining the value of the project under consideration. Stage six is the determination of which projects are acceptable. Stage seven is the implementation of accepted projects. Stage eight is the post-audit of accepted project outcomes.

When making long-term investment decisions, wealth maximization is achieved when the firm invests in all available projects that have a positive net present value. To compute the net present value, the firm needs to know the appropriate discount rate to use to discount the future cash flows from the project. This discount rate is the cost of capital, which is the minimum required rate of return on investment. The cost of capital represents the opportunity cost of funds for the firm, that is, the minimum rate of return that the firm or investors could achieve in another investment.

Modigliani and Miller (1958) develop a model of the overall cost of capital for the firm that is computed as a market value weighted average of the costs of each of the components of capital used by the firm. Modigliani and Miller use long-term debt and common stock as the components of capital. The weights used in the computation of the weighted average cost of capital are the market value proportion of the capital structure represented by each of the cost of capital components. The component cost of each component of the weighted average cost of capital is the marginal cost of capital for each of the capital components.

To determine the cost of equity, we use the capital asset pricing model in which only market wide risk is priced which is systematic or non-diversifiable risk. Systematic risk reflects the covariance between returns on the investment and the return on the market. Markowitz (1953) shows the gains from portfolio diversification and Grubel (1968) shows the gains from international diversification in

an environment with two countries and two assets. The effect of portfolio diversification increases as the covariance between the investment and the market decreases, that is, the gains from international diversification are greater between countries that have less correlated stock markets. Thus, since segmented stock markets have lower covariances with respect to external stock markets, market segmentation leads to greater gains from international diversification. The types of barriers that lead to market segmentation would include differences in trading costs, information availability, generally accepted accounting principles, legal and political systems, taxes rates, investor expectations and preferences, and government restrictions on stock ownership. For example, see Errunza and Losq (1985), Errunza, Losq, and Padmanabhan (1992), and Bekaert and Harvey (1995). Block (2000) reports for a survey of Fortune 1000 firms, that 68.7 percent of the 146 respondents indicate that foreign investment increases the risk exposure of the firm and 31.3 percent indicate that foreign direct investment decreases the risk exposure of the firm. Myers (1998) finds that companies use higher cost of capital rates for foreign investment relative to domestic investment.

The World Bank defines emerging markets as those that are ranked as either low-income economies or middle-income economies. Hooke (2001) finds 156 countries in the emerging market category, that is, with gross national product per capita below \$9000. Keppler and Lechner (1997) find that only sixty of these countries have functioning stock markets and only twenty-five countries meet the International Financial Corporation definition of having functioning and regulated stock exchanges. A number of OPEC countries that meet the gross domestic product requirement for developed markets but do not meet the institutional criterion of having a functional stock market as defined in Khanna and Palepu (1997).

The benefits of international investing are numerous. First, as Grubel (1968) has shown in a two country, two-asset model of portfolio theory, international investment should provide more efficient portfolios. That is, internationally diversified portfolios provide a higher rate of return for a given level of risk or a lower level of risk for a given rate of return. Levy and Sarnat (1970) show that adding developing markets to the investment universe improves the efficient frontier, even if the developing markets provide poor performance individually. More recently, Barry, Peavy and Rodriguez (1997) use the Sharpe Index for comparison purposes and show that emerging markets outperformed developed market during the period from 1986 to 1995 but under performed developed markets during the period from 1990 to 1995. Thus, the advantage of low correlation portfolio effect is evident, returns for developing and emerging stock markets are offsetting.

Reeb, Mansi, and Allee (2001) find that international firms have better credit ratings and lower cost of debt. The cost of firm debt financing is inversely related to the degree of firm internationalization while firm credit rating is positively related to the degree of firm internationalization. Firms with a higher degree of internationalization have better credit ratings and a lower cost of capital. The authors state that the existence of market imperfections and the ability of firms to exploit market imperfections are necessary for multinational diversification to benefit the firm, i.e. reduce the cost of capital. Caves (1971) and Hymer (1976) develop the concept of internalization and Errunza and Senbet (1981) suggest the need to be able to exploit international imperfections.

Reasons for a lower cost of capital for multinational firms revolve around increased cash flow that results from exploiting international market imperfections and the risk reduction benefits of the portfolio effect on cash flow. Barriers that

would allow multinational firms to achieve a lower cost of capital would be such things as controlled interest rates, credit restrictions, market segmentation, and variable prices of risk. Robbins and Stobaugh (1973) suggest numerous means by which multinational enterprises can exploit market imperfections. The weighted average cost of capital can be reduced by the effect of international diversification. By investing in a number of markets, multinational firms benefit from the portfolio effect of international diversification. Diversification leads to lower cash flow volatility and reduced probability of insolvency both of which lower the riskiness and cost of debt.

Emerging markets are more volatile than developed markets but the volatility varies across time and across markets, Errunza, Hogan and Jung (1999), Solnik, Bourcelle, and Le Fur (1996), and Michaud, Bergstrom, Frashure, and Wolahan (1996). Erb, Harvey and Viskanta (1996a) show that emerging markets are segmented because of information problems, institutions shortcomings, less transparent accounting standards, and barriers to foreign investment. Bekaert, Harvey, and Lumsdaine (2002) show that real regulatory environment changes lead to increased foreign portfolio investment. Reduced segmentation leads to larger and more liquid markets and returns that are both more volatile and more correlated with global markets. Increased market integration leads to a lower cost of capital, a higher credit rating, real foreign exchange rate appreciation, and increased real economic growth.

Erb, Harvey and Viskanta (1996a) provide a simple model for estimating the required rate of return for investments in a country.

$$R_{i,t} = a_0 + b_1 \text{CCR}_{i,t} + \xi_{i,t}$$

where, $R_{i,t}$, is the expected return in US dollars for country i , a_0 , is the intercept term, b_1 is the regression coefficient for the country credit rating, $\text{CCR}_{i,t}$, and $\xi_{i,t}$ is the residual term. Erb, Harvey and Viskanta show that the country credit rating model can be used to estimate a cost of capital in emerging markets, even if the particular country does not have a stock market.

McGowan and Tessema (2004) apply the Country Credit Risk Model of Erb, Harvey, and Viskanta (1996a) to develop an International Capital Market Line that can be used to determine the required rate of return for investments in emerging markets, even when those markets do not have stock markets. The Country Credit Rating Model used in this paper uses country credit ratings by *Institutional Investor*, *Euromoney* and *International Country Risk Guide* to develop an International Capital Asset Pricing Model. The results of this model are used to construct an International Capital Market Line that uses the United States long-term equity market return of 12.7 percent and the *Euromoney* Country Credit Rating of the United States that is 93.5. The slope of the International Capital Market Line is 0.35, which is the standardized regression coefficient for the regression between the required rate of return and the *Euromoney* country credit rating. Thus, we can determine the required rate of return for any country for which a country credit rating is available.

Figure 1 shows the International Capital Market Line. The United States has a country credit rating of 93.5 and a long-term equity market rate of 12.7 percent and the international capital market line has a slope of 0.35. Thus, a country with a country credit rating of 100 would have a cost of capital of 10.4 percent. Countries with lower country credit ratings would have a higher cost of capital. The cost of capital for different countries increases by 0.35 percent for each one-point decrease in the country credit rating. A country with a country credit rating of 80 would have a

cost of capital of 17.4 percent and a country with a country credit rating of 40 would have a cost of capital of 31.4 percent.

EUROMONEY COUNTRY CREDIT RATINGS

The country ratings used in this study are taken from the World Bank's *World Development Indicators 2002*, which publishes country credit ratings from a number of sources, including the *Euromoney* ratings. The country credit ratings used in this study are from *Euromoney* that reports country credit ratings twice a year, March and September. The following discussion of the *Euromoney* variables is taken from *Euromoney*, September 2002, pages 207-214. The 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. Debt indicators represent ten percent of the index value. Assume that 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.

Both political risk and economic performance have weights of 25 percent. Political risk measures the likelihood of non-payment of financial obligations with countries rated from ten of zero with a higher rating indicating less political risk. Economic performance 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, and credit ratings are 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 (10). 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 forfaiting 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 forfaiting is measured by the average, maximum tenor for forfaiting and the average spread over riskless countries. Countries where forfaiting is not available are given a rating of zero.

Table 1 contains the values of the *Euromoney* Country Credit Ratings for Japan for 1992-2003. The overall country credit rating for Japan fell from a high of 99.55 in 1992 that ranked Japan as number 2 in the world to 88.30 in 2003 that ranked Japan as number 19 in the world. The financial crisis in East Asia in 1997 to 1998 lead to a five point decrease in the country credit rating for Japan to 88.03 and a rank of number 23 in the world in 1998. The political risk ranking fell from 24.65 to 23.39 in 1998. The economic performance rating fell from 20.80 in 1997 to 15.85 in 1998 as a result of the regional and world-wide recessions. The debt indicator value fell from 30.00 in 1999 to 28.96 in 2003. Credit indicators fell from 20.00 in 1997 to 19.63 in 2003. Figure 2 contains a graph of the *Euromoney* country credit ratings for

Japan from 1993 to 2003 for the four categories of ratings: political risk, economic performance, debt indicators, and credit indicators. Although debt indicators and credit indicators have recovered all but 1.3 points to the pre-crisis level, political risk is still 1.5 points below the pre-crisis level and the economic performance indicator is 6.0 points below the pre-crisis level. The economic performance indicator will likely recover as the world economy recovers.

Figure 1 shows the required rate of return for Japan based on the *Euromoney* Country Credit Rating. The *Euromoney* Country Credit Rating for Japan has dropped from 99.55 in 1992 to 88.30 in 2003. This reduction in the Country Credit Rating implies an increase in the required rate of return for investment in Japan from 11.39 percent in 1993 to 14.50 percent in 2003.

Table 2 shows the values of the *Euromoney* Country Credit Rating for Malaysia from 1992 to 2003. The overall country credit rating rose from 73.61 in 1992 to 83.31 in 1997 just prior to the Asian Financial Crisis of 1997-1998. After the financial crisis, the rating dropped to 41.90 rose to 63.80 in 2001 before falling to 61.00 in 2003. The financial crisis in 1997-1998 led to a decrease in the political risk rating from 21.49 in 1997 to 15.25 in 1998 and a further decrease to 14.25 in 1999 before rising to 16.42 in 2001 and then dropping to 15.47 in 2002 and rising to 15.74 in 2003. The economic performance rating rose from 15.30 in 1992 to 20.93 in 1994 but then fell to 9.22 in 1998 and rose during 2000 and 2001 to 10.08 and 10.86, respectively but fell 9.57 by 2003. The debt indicator ratio rose from 24.40 in 1992 to 27.09 in 1997 before falling to 26.70 in 1998 and 5.93 in 1998 but returned to 24.97 by 2003. Access to short-term financing rose from 12.36 in 1993 to 16.36 in 1997 but fell to 8.24 in 1998 before returning to a level of 10.47 in 2003. Figure 4 shows a graphic representation of the overall country credit rating for Malaysia and each of the four country credit rating components.

Figure 2 provides a graphic representation of the required rate of return and the *Euromoney* country credit rating over the study period for Malaysia. The required rate of return fell to 16.24 percent in 1997 before rising to 30.74 in 1998 and then dropped to 24.05 by 2003. Thus, one can track the influence of the steady improvement of the country credit rating prior to the Asian Financial Crisis in 1997-1998 which caused a decrease in the country credit rating and a subsequent increase in the required rate of return which has not dropped substantially since then.

Table 3 shows the values of the *Euromoney* Country Credit Rating for Russia from 1992 to 2003. The overall country credit rating rose from 21.77 in 1992 to 43.97 in 2003. After the bond default, the rating dropped to 17.67 in 1998 and then rose to 45.98 in 2003. The financial crisis in 1998 led to a decrease in the political risk rating from 9.66 in 1997 to 5.35 in 1998 and a further decrease to 4.40 in 1999 before rising to pre-crisis levels by 2003. The economic performance rating rose slightly in 1998 to 8.26 from 8.09 in 1997 but then fell to 4.98 in 1999 before rising to 8.15 by 2003. The debt ratio rose from 6.00 in 1992 to 20.70 in 1997 before falling to 1.20 in 1998 but returned to 21.79 by 2003. Access to short-term financing fell from 5.53 in 1997 to 2.86 in 1998 and 1.88 in 1999 before returning to a level of 6.14 in 2003.

Figure 3 provides a graphic representation of the required rate of return and the *Euromoney* country credit rating over the study period. The required rate of return fell to 30.01 percent in 1997 rises to 39.22 in 1998 and then dropped to 29.31 by 2003. Thus, one can track the influence of the steady improvement of the country credit rating with the interruption of the 1998 financial crisis.

SUMMARY AND CONCLUSIONS

In this paper, we demonstrate the use of the country credit rating model in Japan, a developed economy, Malaysia, an upper middle-income economy, and Russia, a lower middle-income economy. We find that the country credit rating model tracks the gradual and minor deterioration of the economic condition of Japan, the financial crisis that occurred in Malaysia in 1997-1998, and the shock that hit the Russian economy in 1998 when the government defaulted on bonds, and the subsequent recoveries in both Malaysia and Russia. The *Euromoney* country credit rating for Japan gradually increased over the test period from 1992 to 2003 reflecting the lack of economic performance. For both Malaysia and Russia, the *Euromoney* country credit rating changed dramatically in response to financial crises, a general financial crisis in Asian in the case of Malaysia and a specific default in the case of Russia. In the case of both Malaysia and Russia, the required rate of return increased because of the crisis.

TABLE 1
EUROMONEY COUNTRY CREDIT RATINGS, JAPAN, 1992-2003

Year	PR	EP	DI	CI	CCR	RROR
Sep-92	20.00	19.50	30.00	20.00	99.55	10.56
Sep-93	24.47	22.71	30.00	20.00	97.18	11.39
Sep-94	24.70	21.65	30.00	20.00	96.35	11.68
Sep-95	24.84	21.88	30.00	20.00	96.72	11.55
Sep-96	23.21	20.80	30.00	20.00	94.01	12.50
Mar-97	24.65	18.38	30.00	20.00	93.03	12.84
Sep-98	23.39	15.85	30.00	18.79	88.03	14.59
Sep-99	23.26	19.31	29.58	18.71	90.86	13.60
Sep-00	23.51	18.41	29.58	19.19	90.69	13.66
Mar-01	23.45	18.94	29.17	19.01	90.57	13.70
Sep-02	21.50	19.26	28.75	19.17	88.68	14.36
Mar-03	22.95	16.76	28.96	19.63	88.30	14.50

PR – political risk, EP – economic performance, DI – debt indicators, CI – credit indicators, CCR – *Euromoney* Country Credit Rating, RROR – required rate of return

FIGURE 1
REQUIRED RATE OF RETURN FOR JAPAN BASED ON *EUROMONEY*
COUNTRY CREDIT RATINGS 1992-2003

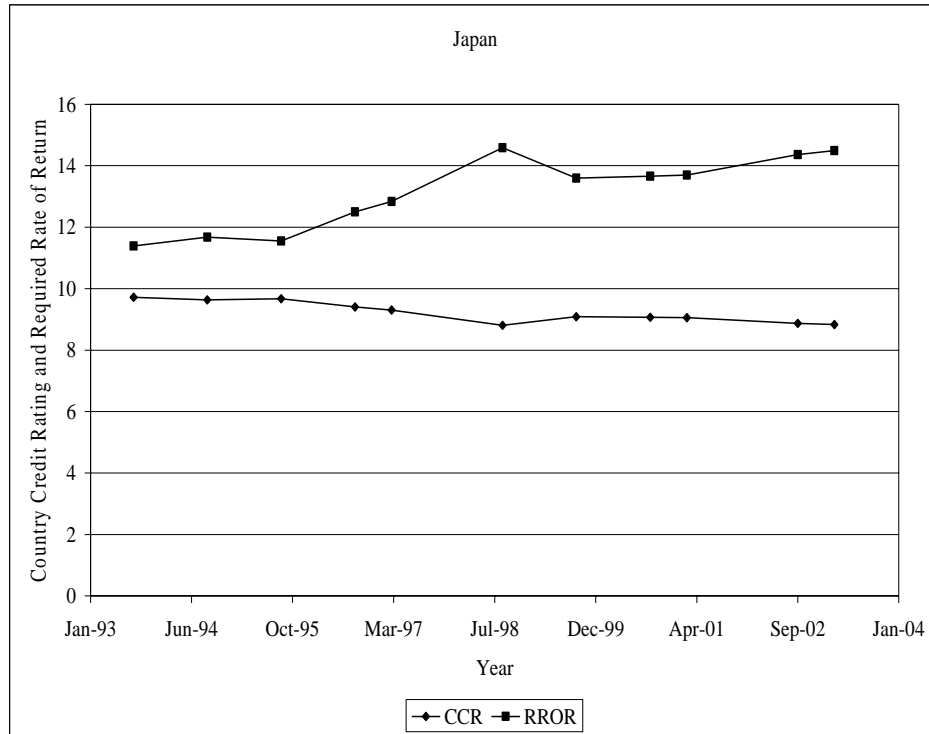


TABLE 2
EUROMONEY COUNTRY CREDIT RATINGS, MALAYSIA, 1993-2003

Year	PR	EP	DI	DI	CCR	RROR
Sep-92	8.60	15.30	24.40	25.30	73.61	19.64
Sep-93	22.49	18.09	25.58	12.36	78.50	17.93
Sep-94	22.78	20.93	25.59	12.61	81.90	16.74
Sep-95	22.45	18.59	26.32	11.26	78.60	17.89
Sep-96	20.98	17.59	27.09	14.52	80.20	17.33
Mar-97	21.49	18.78	26.70	16.36	83.32	16.24
Sep-98	15.25	12.47	5.93	8.24	41.90	30.74
Sep-99	14.25	9.22	24.09	9.50	57.05	25.43
Sep-00	15.86	10.08	24.30	10.89	61.11	24.01
Mar-01	16.42	10.86	25.35	11.15	63.80	23.07
Sep-02	15.47	9.67	24.25	11.42	63.05	23.33
Mar-03	15.74	9.57	24.97	10.74	61.00	24.05

PR – political risk, EP – economic performance, DI – debt indicators, CI – credit indicators, CCR – *Euromoney* Country Credit Rating, RROR – required rate of return

FIGURE 2
REQUIRED RATE OF RETURN FOR MALAYSIA BASED ON EUROMONEY
COUNTRY CREDIT RATINGS, 1992-2003

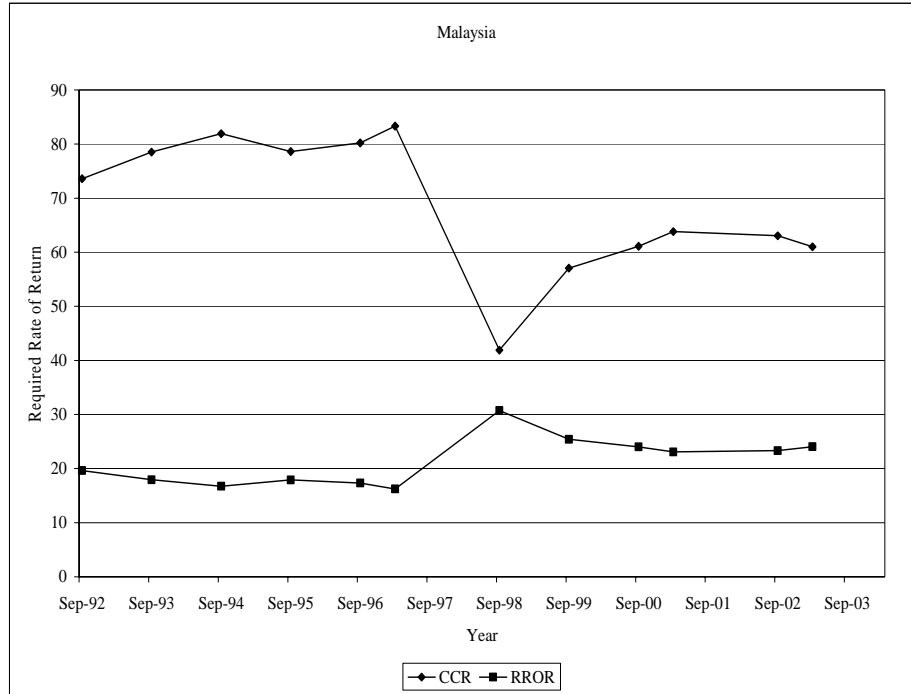
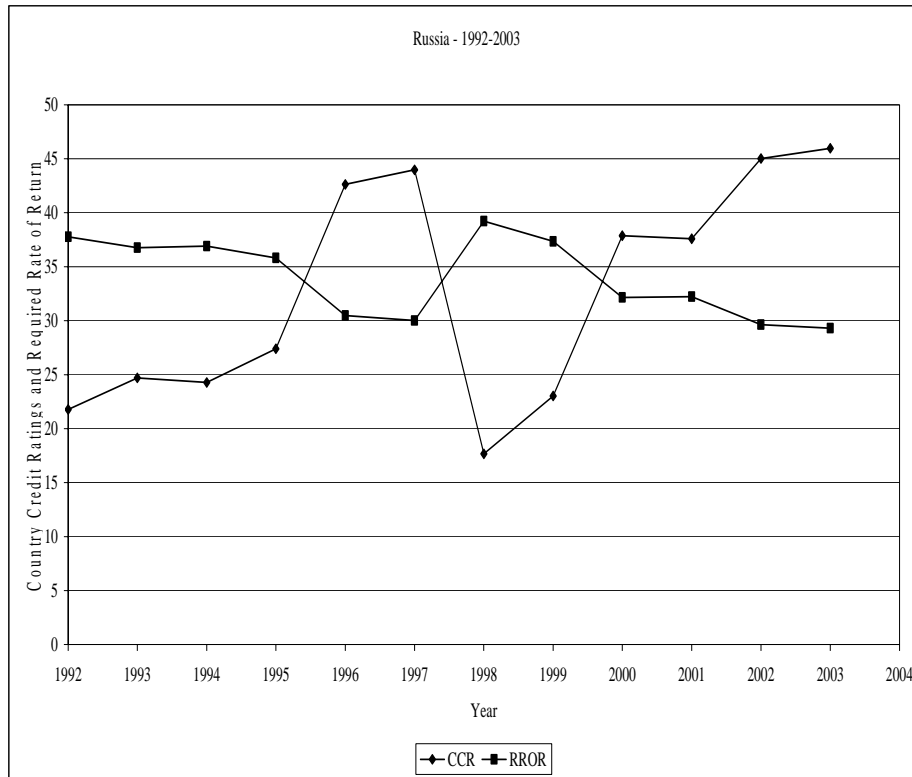


TABLE 3
EUROMONEY COUNTRY CREDIT RATINGS, RUSSIA, 1992-2003

Date	PR	EP	DI	CI	CCR	RROR
Sep-92	2.90	6.80	6.00	6.00	21.77	37.78
Sep-93	7.49	7.18	8.77	1.25	24.69	36.76
Sep-94	7.75	5.28	10.00	1.25	24.28	36.90
Sep-95	9.68	5.48	8.26	3.99	27.40	35.81
Sep-96	11.47	8.33	17.99	4.83	42.62	30.48
Mar-97	9.66	8.09	20.70	5.53	43.97	30.01
Sep-98	5.35	8.26	1.20	2.86	17.67	39.22
Sep-99	4.40	4.98	11.76	1.88	23.02	37.34
Sep-00	8.02	6.65	17.30	5.91	37.88	32.14
Mar-01	7.35	5.15	18.99	5.88	37.60	32.24
Sep-02	11.74	8.26	18.97	6.05	45.03	29.64
Mar-03	9.74	8.15	21.79	6.14	45.98	29.31

PR – political risk, EP – economic performance, DI – debt indicators, CI – credit indicators, CCR – *Euromoney* Country Credit Rating, RROR – required rate of return

FIGURE 3
 REQUIRED RATE OF RETURN FOR RUSSIA BASED ON *EUROMONEY*
 COUNTRY CREDIT RATINGS, 1992-2003



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