

Country Risk Ratings: An International Comparison*

Suhejla Hoti and Michael McAleer

Department of Economics
University of Western Australia

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Abstract: Country risk has become a topic of major concern for the international financial community over the last two decades. The importance of country ratings is underscored by the existence of several major country risk rating agencies, namely the Economist Intelligence Unit, Euromoney, Institutional Investor, International Country Risk Guide, Moody's, Political Risk Services, and Standard and Poor's. These risk rating agencies employ different methods to determine country risk ratings, combining a range of qualitative and quantitative information regarding alternative measures of economic, financial and political risk into associated composite risk ratings. However, the accuracy of any risk rating agency with regard to any or all of these measures is open to question. For this reason, it is necessary to review the literature relating to empirical country risk models according to established statistical and econometric criteria used in estimation, evaluation and forecasting. Such an evaluation permits a critical assessment of the relevance and practicality of the country risk literature. The paper also provides an international comparison of country risk ratings for twelve countries from six geographic regions. These ratings are compiled by the International Country Risk Guide, which is the only rating agency to provide detailed and consistent monthly data over an extended period for a large number of countries. The time series data permit a comparative assessment of the international country risk ratings, and highlight the importance of economic, financial and political risk ratings as components of a composite risk rating.

Keywords: Country risk; economic risk; financial risk; political risk; composite risk; risk ratings; risk returns; volatilities; component analysis; international comparison.

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1. Introduction

1.1 Country risk

Following the rapid growth in the international debt of less developed countries in the 1970s and the increasing incidence of debt rescheduling in the early 1980s, country risk, which reflects the ability and willingness of a country to service its financial obligations, has become a topic of major concern for the international financial community (Cosset and Roy, 1991). Political changes resulting from the fall of communism, and the implementation of market-oriented economic and financial reforms, have resulted in an enormous amount of external capital flowing into the emerging markets of Eastern Europe, Latin America, Asia, and Africa (Ramcharran, 1999). These events have alerted international investors to the fact that the globalisation of world trade and open capital markets are risky elements that can cause financial crises with rapid contagion effects, which threaten the stability of the international financial sector (Hayes, 1998). In light of the tumultuous events flowing from 11 September 2001, the risks associated with engaging in international relationships has increased substantially, and become more difficult to analyse and predict for decision makers in the economic, financial and political sectors.

Given these new developments, the need for a detailed assessment of country risk and its impact on international business operations is crucial. Country risk refers broadly to the likelihood that a sovereign state or borrower from a particular country may be unable and/or unwilling to fulfil their obligations towards one or more foreign lenders and/or investors (Krayenbuehl, 1985). A primary function of country risk assessment is to anticipate the possibility of debt repudiation, default or delays in payment by sovereign borrowers (Burton and Inoue, 1985). Country risk assessment evaluates economic, financial, and political factors, and their interactions in determining the risk associated with a particular country. Perceptions of the determinants of country risk are important because they affect both the supply and cost of international capital flows (Brewer and Rivoli, 1990).

Country risk may be prompted by a number of country-specific factors or events. There are three major components of country risk, namely economic, financial and political risk. The country risk literature holds that economic, financial and political

risks affect each other. As Overholt (1982) argues, international business scenarios are generally political-economic as businesses and individuals are interested in the economic consequences of political decisions.

The lending risk exposure vis-à-vis a sovereign government is known as sovereign risk (Juttner, 1995). According to Ghose (1988), sovereign risk emerges when a sovereign government repudiates its overseas obligations, and when a sovereign government prevents its subject corporations and/or individuals from fulfilling such obligations. In particular, sovereign risk carries the connotation that the repudiation occurs in situations where the country is in a financial position to meet its obligations. However, sovereign risk also emerges where countries are experiencing genuine difficulties in meeting their obligations. In an attempt to extract concessions from their lenders and to improve rescheduling terms, negotiators sometimes threaten to repudiate their “borrowings” (Bourke, 1990).

Political risk is generally viewed as a non-business risk introduced strictly by political forces. Banks and other multinational corporations have identified political risk as a factor that could seriously affect the profitability of their international ventures (Shanmugam, 1990). Ghose (1988) argues that political risk is analogous to sovereign risk and lies within the broader framework of country risk. Political risk emerges from events such as wars, internal and external conflicts, territorial disputes, revolutions leading to changes of government, and terrorist attacks around the world. Social factors include civil unrests due to ideological differences, unequal income distribution, and religious clashes. Shanmugam (1990) introduces external reasons as a further political aspect of country risk. For instance, if the borrowing nation is situated alongside a country that is at war, the country risk level of the prospective borrower will be higher than if its neighbour were at peace. Although the borrowing nation may not be directly involved in the conflict, the chances of a spillover effects may exist. Additionally, the inflow of refugees from the war would affect the economic conditions in the borrowing nation. In practical terms, political risk relates to the possibility that the sovereign government may impose foreign exchange and capital controls, additional taxes, and asset freezes or expropriations. Delays in the transfer of funds can have serious consequences for investment returns, import payments and export receipts, all of which may lead to a removal of the forward cover (Juttner, 1995).

Economic and financial risks are also major components of country risk. They include factors such as sudden deterioration in the country's terms of trade, rapid increases in production costs and/or energy prices, unproductively invested foreign funds, and unwise lending by foreign banks (Nagy, 1988). Changes in the economic and financial management of the country are also important factors. These risk factors interfere with the free flow of capital or arbitrarily alter the expected risk-return features for investment. Foreign direct investors are also concerned about disruptions to production, damage to installations, and threats to personnel (Juttner, 1995).

1.2 Country risk ratings

Since the Third World debt crisis in the early 1980s, commercial agencies such as Moody's, Standard and Poor's, Euromoney, Institutional Investor, Economist Intelligence Unit, International Country Risk Guide, and Political Risk Services, have compiled sovereign indexes or ratings as measures of credit risk associated with sovereign countries. Risk rating agencies provide qualitative and quantitative country risk ratings, combining information about alternative measures of economic, financial and political risk ratings to obtain a composite risk rating. This paper provides an international comparison of country risk ratings and returns compiled by the International Country Risk Guide (ICRG), which is the only risk rating agency to provide detailed and consistent monthly data over an extended period for a large number of countries.

Derivative assets, such as futures and options, are used to hedge against price risk in commodity markets. In particular, country risk ratings are used to hedge against issued bonds. Optimal hedging strategies and an evaluation of the risk associated with risk ratings require knowledge of the volatility of the underlying process. As volatility is generally unknown, it must be estimated. These estimated and predicted volatilities are fundamental to risk management in financial models that describe the risk-return trade-off. Although there does not yet seem to be an established market for pricing risk ratings as a primary or derivative asset, estimating and testing the volatility associated with risk ratings would seem to be a first step in this direction. In the finance and financial econometrics literature, conditional volatility has been used to evaluate risk, asymmetric shocks, and leverage effects. The volatility present in risk ratings also reflects risk considerations in risk ratings. As risk ratings are in effect,

indexes, their rate of change, or returns, merits attention in the same manner as financial returns (for further details, see Hoti, Chan and McAleer (2002)).

The plan of the paper is as follows. Section 2 provides a quantitative classification of empirical country risk models, which forms the database, and also classifies and describes the data. Various theoretical and empirical model specifications used in the literature are reviewed analytically and empirically in Section 3. Section 4 discusses the empirical findings of the published studies. A comparison of ICRG country risk ratings, risk returns, and their associated volatilities for twelve representative developing countries is given in Section 5. Concluding remarks are presented in Section 6.

2. Classification of country risk models and the data

For purposes of evaluating the significance of empirical models of country risk, it is necessary to analyse such models according to established statistical and econometric criteria. The primary purpose of each of these empirical papers is to evaluate the practicality and relevance of the economic, financial and political theories pertaining to country risk. An examination of the empirical impact and statistical significance of the results of the country risk models will be based on an evaluation of the descriptive statistics relating to the models, as well as the econometric procedures used in estimation, testing and forecasting.

This paper reviews 50 published empirical studies on country risk (the papers are listed in the Appendix). A classification of the 50 empirical studies is given according to the model specifications examined, the choice of dependent and explanatory variables considered, the number of explanatory variables used, econometric issues concerning the recognition, type and number of omitted explanatory variables, the number and type of proxy variables used when variables are omitted, the method of estimation, and the use of diagnostic tests of the auxiliary assumptions of the models.

Scrutiny of the ECONLIT software package and the Social Science Citation Index for the most widely cited articles in the Country Risk literature yields at least 50 published empirical papers over the last three decades in refereed journals. Although the first two papers were published in 1971 (in *Journal of International Economics*)

and 1977 (in *Journal of Development Economics*), there were 16 papers published in the 1980s, a further 30 papers published in the 1990s, and with the 2 most recent papers having been published in 2001. Thus, the literature is essentially two decades old. There is no leading journal in the literature on country risk, with the *Journal of Development Economics* publishing 6 papers, the *Journal of International Business Studies* publishing 4 papers, the *Journal of Banking and Finance*, the *Economics Letters*, and *Applied Economics* each publishing 3 papers, *Applied Economics Letters* and *Global Finance Journal* each publishing 2 papers, and 27 other journals each publishing one paper on the topic.

In Table 1, the 50 studies are classified according to the type of data used, namely cross-section or pooled, which combines time series and cross-section samples. Common sources of data are the International Monetary Fund, Bank for International Settlements, various sources of the World Bank, Euromoney, Institutional Investor, Moody's, Standard and Poor's, and various country-specific statistical bureaux. Almost three-quarters of the studies are based on pooled data, with the remaining one-quarter based on cross-section data.

[Table 1]

Table 2 classifies the 34 studies using pooled data according to the number of countries, which varies from 5 to 95 countries, with mean 48 and median 47, with the frequency of occurrence of each number generally being 1. The same 34 studies using pooled data are classified according to the number of annual and semi-annual observations in Tables 3 and 4, respectively. For the annual observations, the range of the 19 data sets is 5 to 24 years, with the mean, median and mode of the number of observations being 12, 11 and 5, respectively, with the frequency of occurrence of each number varying between 1 and 5. The range of the 8 data sets using semi-annual observations is 8 to 38 half-years, with the mean and median and mode of the number of observations being 18.5 and 17, respectively.

[Tables 2-4]

Tables 5 and 6 classify the studies using cross-section data according to the number of countries and the number of time series observations, respectively. In Table 5, 1 study

did not report the number of countries used, while another study used data on 892 municipalities. Of the remaining 16 studies, the range is 18 to 143 countries, with mean 55.3 and median 50.5. There are 29 data sets using time series observations in Table 6, with range 1 to 23, mean 5.3, median 3, and mode 1. Indeed, the most commonly used number of time series observations is 1, with a frequency of 10 in the 29 data sets, so that more than one-third of the cross-section data sets used are based on a single year.

[Tables 5-6]

3. Theoretical and empirical model specifications

The general country risk model typically estimated, tested and evaluated is given as:

$$f(Y_t, X_t, u_t; \beta) = 0 \quad (1)$$

in which $f(\cdot)$ is an unspecified functional form, Y is the designated (vector of) endogenous variables, X is the (vector of) exogenous variables, u is the (vector of) errors, β is the vector of unknown parameters, and $t = 1, \dots, n$ observations. As will be discussed below, equation (1) is typically given as a linear or log-linear regression model, or as a logit, probit or discriminant model. The elements of Y and X will also be discussed below. Defining the information set at the end of period $t-1$ as $I_{t-1} = [Y_{t-1}, Y_{t-2}, Y_{t-3}, \dots; X_t, X_{t-1}, X_{t-2}, X_{t-3}, \dots]$, the assumptions of the classical model are typically given as follows:

- (A1) $E(u_t) = 0$ for all t ;
- (A2) constant variance of u_t ;
- (A3) serial independence (namely, no covariation between u_t and u_s for $t \neq s$);
- (A4) X is weakly exogenous (that is, there is no covariation between X_t and u_s for all t and s);
- (A5) u is normally distributed;
- (A6) parameters are constant;

(A7) Y and X are both stationary processes, or are cointegrated if both are non-stationary.

Diagnostic tests play an important role in modern empirical econometrics, and are used to check the adequacy of a model through testing the underlying assumptions. The standard diagnostic checks which are used to test assumptions (A1) through (A7) are various tests of functional form misspecification, heteroscedasticity, serial correlation, exogeneity, third- and higher-order moments of the distribution for non-normality, constancy of parameters and structural change, unit root tests, and tests of cointegration. There is, in general, little or no theoretical basis in the literature for selecting a particular model. In empirical analysis, however, computational convenience and the ease of interpretation of models are primary considerations for purposes of model selection.

Of the 70 models used in the 50 studies, which are reported in Table 7, all but six are univariate models. The most popular model in the literature is the logit model, which is used 23 times, followed by the probit, discriminant, and Tobit models, which are used 10, 7, and 3 times, respectively. Thus, more than half of the models used in the literature are probability-based models. Given the popularity of the linear and log-linear regression models in empirical economic research, it is surprising to see that the linear regression model is used four times, the log-linear regression model is used only twice, and both regression models are used in the same study only twice. The artificial neural network model is also used twice. Of the remainder, the multi-group hierarchical discrimination model, two-way error components model, random-effect error component equations, naive model, combination model, G-logit model, nested trinomial logit, sequential-response logit, unordered-response logit, classification and regression trees, and cluster analysis, are used once each.

[Table 7]

The dependent variable for purposes of analysing country risk is broadly classified as the ability to repay debt. Of the different types of dependent variables given in Table 8, with more than one dependent variable being used in some studies, the most frequently used variable is debt rescheduling, which is used 36 times. This dependent variable is defined as the probability of general, commercial, and official debt

rescheduling or debt default (in the current year or in the future), and discriminant score of whether a country belongs to a rescheduling or non-rescheduling group. The second most frequently used variable is agency country risk ratings, which is used 18 times. In the empirical analyses, this dependent variable is defined as Institutional Investor, Euromoney, Standard and Poor's, Moody's, and Economist Intelligence Unit country or municipality risk ratings, and the average of agency country risk ratings. Ten types of dependent variable are used more than once, with debt arrears (defined as the limit on debt arrears), dummy for significant debt arrears, probability of experiencing significant debt arrears, and probability of emerging debt-servicing arrears being used 4 times each, and average value of debt rescheduling, exchange rate movements, fundamental valuation ratios, demand for debt, and supply of debt being used 3 times each. Dependent variables, such as the propensity to obtain agency municipality credit risk ratings, public debt to private creditors, total reserves, and total or relative bond spread, are used twice each, with the remaining 10 types of dependent variable, which are used once each, including weighted average loan spread, spread over LIBOR, yield spreads of international bonds, payment interruption likelihood index, sovereign loan default, credit risk rating, income classification, stock returns, secondary market price of foreign debt, and dummy for debt crisis.

[Table 8]

There are three types of explanatory variables used in the various empirical studies, namely economic, financial and political. Treating country risk variables as economic and/or financial, and regional differences as political, Tables 9 and 10 present the numbers of each type of variable and their frequency. In Table 9, the number of economic and financial variables ranges from 2 to 32, with mean 11.5, median 8 and mode 6. Seven of the 19 sets of economic and financial variables have a frequency of one, with a frequency of 2 occurring 3 times, a frequency of 3 occurring 5 times, and frequencies of 4, 5, and 6 occurring once each. In Table 10, the number of political variables ranges from 0 to 13, with mean 1.86, median 0 and mode 0. The absence of any political variable occurs 30 times in the 50 studies.

[Tables 9-10]

Of the remaining 10 sets of political variables, 2 have a frequency of 4, one has a frequency of 3, 2 have a frequency of 2, and five have a frequency of one. Hundreds of different economic, financial and political explanatory variables have been used in the 50 separate studies. The set of economic and financial variables includes indicators for country risk ratings, debt service, domestic and international economic performance, domestic and international financial performance, monetary reserves, and structural differences. Indicators for country political risk ratings, domestic and international armed conflict, political events, and regional differences are used in the set of political variables.

The unavailability of the required data means that proxy variables have frequently been used for the unobserved variables. Tables 11 and 12 are concerned with the important issue of omitted explanatory variables in each of the 50 studies. It is well known that, in general, omission of relevant explanatory variables from a linear regression model yields biased estimates of the coefficients of the included variables, unless the omitted variables are uncorrelated with each of the included explanatory variables. For non-linear models, consistency replaces unbiasedness as a desirable statistical characteristic of an estimation method. In some studies, there is an indication of the various types of variables that are recognised as being important. Nevertheless, some of these variables have been omitted because they are simply unavailable. The classification in Table 11 is by recognition of omitted explanatory variables, where the recognition is explicitly stated in the study. Such an explicit recognition of omitted explanatory variables is used primarily as a check of consistency against the number of proxy variables used.

[Table 11]

Of the 50 studies in Table 11, exactly three-fifths did not explicitly recognise that any variables had knowingly been omitted, with the remaining 20 studies recognising that 39 explanatory variables had been omitted. The number of explanatory variables explicitly recognised as having been omitted varies from 1 to 8. Including and excluding the 30 zero entries for omitted explanatory variables give mean numbers omitted of 0.78 and 1.95, respectively, medians of 0 and 1, and modes of 0 and 1. Thirteen of the 20 studies, which explicitly recognised the omission of explanatory variables, noted that a single variable had been omitted.

The classification in Table 12 is given according to the type of omitted explanatory variable, which is interpreted as predominantly economic and financial or political. More than two-thirds of the omitted explanatory variables are predominantly economic and financial in nature, and the remaining one-third is predominantly political. Somewhat surprisingly, very few studies stated dynamics as having been omitted from the analysis, even though most did not explicitly incorporate dynamics into the empirical specifications.

[Table 12]

As important economic, financial and political explanatory variables have been recognised as having been omitted from two-fifths of the 50 studies (see Table 11), proxy variables have been used in most of these studies. Tables 13 and 14 are concerned with the issues of the number and type of proxy variables used. The problems associated with the use of ordinary least squares (OLS) to estimate the parameters of linear models in the presence of one or more proxy variables are generally well known in the econometrics literature, but extensions to non-linear models, which dominate the literature on country risk, are not yet available. Nevertheless, as a guide for analysis, the basic results are outlined below. These results are of special concern as one-half of the studies explicitly recognises the omission of at least one explanatory variable.

In the case where only one proxy variable is used to replace a variable which is unavailable, the basic results are as follows: (1) the absolute bias in the estimated coefficient of the proxy variable is less than the case where the proxy variable is excluded; (2) the absolute bias in the estimated coefficient of the correctly measured variable is less than in the case where the proxy variable is excluded; (3) a reduction in measurement error is beneficial; and (4) it is preferable to include the proxy variable than to exclude it. When two or more proxy variables are used to replace two or more variables, which are unavailable, it is not necessarily the case that the four basic results stated above actually hold. Thus, among other outcomes, the absolute bias in the estimated coefficients of both the correctly measured and incorrectly measured variables may be higher if two or more proxy variables are not used than when they are used, a reduction in measurement error may not be beneficial, and it may not be preferable to include two or more proxy variables than to exclude them.

The reason for the different outcomes is that the covariation in two or more measurement errors may exacerbate the problem of measurement error rather than containing it.

Table 13 classifies the 20 studies by the use of proxy variables, which ranges from 1 to 7. Including and excluding the 2 zero entries for the number of proxy variables used give mean numbers omitted of 2.45 and 2.72, respectively, a median of 2 in each case, and a mode of 1 in each case. By comparison with Table 11, in which 13 of the 20 studies explicitly recognised the omission of a single explanatory variable, Table 13 shows that only 7 studies used a single proxy variable. Otherwise, the results in Tables 11 and 13 are reasonably similar.

[Table 13]

The classification in Table 14 is given according to the type of proxy variable used, which is interpreted as comprising predominantly economic and financial or political factors. More than two-thirds of the proxy variables are predominantly economic and financial in nature, and the remaining one-third is predominantly political, which is very similar to the results given in Table 12.

[Table 14]

In Table 15 the classification is by method of estimation, in which more than one estimation method is used in some studies. Five categories are listed, namely OLS, maximum likelihood (ML), Heckman's two-step procedure, discriminant methods, and Others, which includes entries for, among others, propagation algorithm, regression-based techniques, approximation, minimax, Bayesian, optimal minimum distance, stepwise, optimisation, binary splits, jack-knife methods and OLS and WLS. Even though logit and probit models in Table 7 are used 40 times in total, ML is used for estimation purposes only 35 times. Moreover, while linear and log-linear models are used only 7 times in total in Table 7, OLS is used 14 times in Table 15 (15 times if both OLS and WLS are included). Finally, while discriminant models are used 7 times in Table 7, discriminant estimation is used only three times in Table 15.

[Table 15]

Finally, the classification in Table 16 is by use of diagnostics to test one or more auxiliary assumptions of the models. The role of diagnostic tests has become well established in the econometrics literature in recent years, and plays an increasingly prominent role in modern applied econometrics (see McAleer (1994) for further details). Most diagnostic tests of the auxiliary assumptions are standard, and are available in widely used econometric software packages. Unbelievably, 42 of the 50 studies did not report any diagnostic tests whatsoever. Of the eight which did report any diagnostic tests at all, there were two entries for White's standard errors for heteroscedasticity, and one entry for each of WLS and heteroscedasticity, transformation for non-normality, White's covariance matrix for heteroscedasticity, Chow test, Hajivassiliou's test for exogeneity, and serial correlation. This is of serious concern, especially as the ML method is known to lack robustness to departures from the stated assumptions, but is nevertheless used 35 times. Models such as the logit and probit are also sensitive to departures from the underlying logistic and normal densities, respectively, so that the underlying assumptions should be checked rigorously. As the use of diagnostics has been ignored in the country risk literature, in general, the empirical results should be interpreted with some caution and scepticism.

[Table 16]

4. Empirical findings

Of the 91 types of dependent variables used in the 50 studies, 27 studies examined debt rescheduling on 36 occasions and 17 considered country risk ratings on 18 occasions (see Table 8 for definitions of these two types of variables). Table 17 reports four types of risk component variables used in the 17 country risk ratings studies, namely economic, financial, political, and composite. Composite risk variables are ratings or aggregates that comprise economic, financial and political risk component variables, and were used in all 17 studies. Of these studies, only two did not use economic variables and only one did not use financial variables. Political variables have been used less frequently, namely in 10 studies. Table 18 presents the number of country risk components used, as well as their frequency. All four country risk components have been used in 10 studies, 4 studies used variables representing three risk components, 3 studies used variables representing two risk components, and no study used variables representing only one risk component.

[Tables 17-18]

In Table 19, the 17 are classified according to the risk rating agency they used, namely Institutional Investor, Euromoney, Moody's Standard and Poor's, International Country Risk Guide, Economist Intelligence Unit, and Political Risk Services. These agencies are leading commercial analysts of country risk. While the rating system for the International Country Risk Guide will be analysed in the next section, the rating systems for the other agencies are briefly discussed below. Unless otherwise stated, the information regarding the agency rating systems is taken from the website of Foreign Investment Advisory Service Program, which is a joint service of two leading multilateral development institutions, namely the International Finance Corporation and World Bank (http://www.fias.net/investment_climate.html).

[Table 19]

Institutional Investor compiles semi-annual country risk surveys, which are based on responses provided by leading international banks. Bankers from 75-100 banks rate more than 135 countries on a scale of 0 to 100, with 100 representing the lowest risk. The individual ratings are weighted using the Institutional Investor formula, with greater weights assigned to responses based on the extent of a bank's worldwide exposure and the degree of sophistication of a bank's country risk model. The names of the participating banks are kept strictly confidential (Howell, 2001). Institutional Investor country risk surveys are published in the March and September issues of the monthly magazine. In the country risk literature, the Institutional Investor country risk assessment is known as the banker's judgment.

Like Institutional Investor, Euromoney provides semi-annual country risk ratings and rankings. Countries are given their respective scores based on nine components, and are ranked accordingly. In order to obtain the overall country risk score, a weight is assigned to each of the nine categories (political risk, 25%; economic performance, 25%; debt indicators, 10%; debt in default or rescheduled, 10%; credit ratings, 10%; access to bank finance, 5%; access to short-term finance, 5%; access to capital markets, 5%; and discount on forfeiting, 5%). The best underlying value per category achieves the full weighting, while the worst scores zero. All other values are

calculated relative to the best and worst scores. Surveys are published in the March and September issues of this monthly magazine.

Standard and Poor's (S&P's) provides weekly updates on the credit ratings of sovereign issuers in 77 countries and territories. Sovereign ratings are not country ratings as they address the credit risks of national governments, not the credit risk of other issuers. However, sovereign ratings set the benchmark for the ratings assigned to other issuers in the country. S&P's provides short- and long-term ratings, as well as a qualitative outlook on the sovereign's domestic and foreign currency reserves. Ratings are provided for seven major areas, namely long-term debt, commercial paper, preferred stock, certificates of deposit, money market funds, mutual bond funds, and the claims-paying ability of insurance companies. The determination of credit risk incorporates political risk (the willingness of a government to service its debt obligations) and economic risk (the government's ability to service its debt obligations) (Howell, 2001). Foreign currency issuer ratings are also distinguished from local currency issuer ratings to identify those instances where sovereign risk makes them different for the same issuer. Quantitative letter ratings range from C (lowest) to AAA (highest). The rating outlook assesses the potential direction of a long-term credit rating over the intermediate to longer term. In determining a rating outlook, consideration is given to any changes in the economic and/or fundamental business conditions.

Moody's provides sovereign credit risk analysis for more than 100 nations, virtually every one of which participates in the world's capital markets. For each nation, Moody's publishes several different types of ratings to capture divergent risks, including country ratings for both short- and long-term foreign currency securities. In establishing country risk, Moody's analysts assess both political and economic variables to derive country risk ratings, which act as sovereign ceilings or caps on ratings of foreign currency securities of any entity that falls under the political control of a sovereign state (Howell, 2001). Country risk ratings account for foreign currency transfer risk and systemic risk in the nation. Using Moody's Aaa to C rating scale, foreign currency long-term government bonds and domestic currency long-term government bonds are rated. Local currency guideline ratings, which indicate the highest rating level likely for debt issues denominated in local currency, are also provided.

Political Risk Services (PRS) provides reports for 100 countries. Each report assesses potential economic, financial and political risks to business investments and trade. Country reports are the only source for risk forecasts and analysis based on the PRS rating system, which assesses different political scenarios. PRS provides a political risk model with three industry forecasts at the micro level, namely financial transfers (banking and lending), foreign direct investment (such as retail, manufacturing, and mining), and exports to the host country market. The 100 reports are revised on a quarterly basis (<http://www.prsgroup.com/commonhtml/methods.html>).

Economist Intelligence Unit (EIU) publishes country risk reports that are available quarterly with monthly updates. These reports summarise the risk ratings for all 100 key emerging and highly indebted countries that are monitored by the Country Risk Service (CRS). The CRS risk rating methodology examines two different types of risk: (1) country risk, as determined by (with weights in parentheses) political (22%), economic policy (28%), economic structure (27%), and liquidity (23%) factors; and (2) specific investment risk. Three different types of specific investment risk are currency risk (associated with accepting foreign exchange exposure against the US dollar), sovereign debt risk (associated with foreign currency loans to sovereign states), and banking sector risk (associated with foreign currency loans to banks). These specific investment risk ratings are also determined by the same four factors, with different weights. For currency risk, economic policy is the most heavily weighted factor at 65%, with economic structure, political, and liquidity factors having weights of 17%, 14%, and 4%, respectively. In the case of sovereign debt risk, liquidity has the highest weight at 31%, with economic policy and economic structure each being weighted at 27%, and the political factor at 15%. Finally, for banking sector risk, economic structure is the most heavily weighted at 44%, with economic policy, liquidity, and political factors weighted at 35%, 15%, and 6%, respectively (<http://store.eiu.com>).

Table 20 examines the 27 studies concerned with debt rescheduling, in which three types of variables were used, namely economic, financial and political. The economic and financial variables were used in each of the 27 studies, whereas political variables were used in only 9 studies. Table 21 presents the number of variables used in debt rescheduling, as well as their frequency. All three variables have been used in 9

studies, two of the three variables were used in the remaining 18 studies, and no study used only one of the three variables.

[Tables 20-21]

5. Comparison of ICRG country risk ratings

Since January 1984, the International Country Risk Guide (ICRG) has been compiling economic, financial, political and composite risk ratings for 90 countries on a monthly basis. As of October 2002, the four risk ratings were available for a total of 140 countries and 144 entries, the extra four entries relating to the former sovereign states of Czechoslovakia, East Germany, West Germany and the USSR. According to the ICRG, its risk ratings have been cited by experts at the IMF, World Bank, United Nations, and other international institutions, as a standard against which other ratings can be measured. The ICRG has been acclaimed by publications such as Barron's and The Wall Street Journal for the strength of its analysis and rating system.

Several issues relating to the ICRG coverage of the listed countries should be emphasised. Some sovereign states, such as the former Soviet Union republics and the former Communist Block countries, have been covered only recently. Furthermore, structural changes are, in general, not accommodated in the risk ratings. The ICRG rating system was adjusted in late-1997 to reflect the changing international climate created by the ending of the Cold War. Prior to this structural change, the financial risk ratings were entirely subjective because of the lack of reliable statistics. By 1997, the risk assessments were made by the ICRG on the basis of independently generated data, such as from the IMF, which could be referenced consistently over time.

Until the dissolution of the former Federal Republic of Yugoslavia, ICRG covered Yugoslavia which comprised all six republics. After the dissolution, Yugoslavia refers to the currently constituted Federal Republic of Yugoslavia, comprising the Republic of Montenegro and the Republic of Serbia, which includes the UN-administered southern province of Kosovo and the northern province of Vojvodina. Since December 1998, ICRG has been covering separately two of the former Yugoslavian republics, namely Croatia and Slovenia, which are now internationally recognized sovereign states. Data for the other two new sovereign states, namely Bosnia-

Herzegovina and the Former Yugoslav Republic of Macedonia, are not currently available. The ICRG coverage of the former East and West Germany also merits discussion. After the fall of the Berlin Wall in November 1989, East and West Germany were reunited, so there is only one entry for Germany in the ICRG series from October 1990. Data for the former West Germany and East Germany are available separately for January 1984 – September 1990 and June 1984 – September 1990, respectively.

The ICRG rating system comprises 22 variables representing three major components of country risk, namely economic, financial and political. These variables essentially represent risk-free measures. There are 5 variables representing each of the economic and financial components of risk, while the political component is based on 12 variables.

Economic risk rating measures a country's current economic strengths and weaknesses. In general, when a country's strengths outweigh its weaknesses it presents a low economic risk, and when its weaknesses outweigh its strengths the country presents a high economic risk. This permits an assessment of the ability to finance its official, commercial, and trade debt obligations. The 5 economic variables, and the range of risk points assigned to each, are as follows:

- (i) GDP per Head of Population (0-5);
- (ii) Real Annual GDP Growth (0-10);
- (iii) Annual Inflation Rate (0-10);
- (iv) Budget Balance as a Percentage of GDP (0-10);
- (v) Current Account Balance as a Percentage of GDP (0-15).

Financial risk rating is another measure of a country's ability to service its financial obligations. This rating assesses a country's financial environment based on the following 5 financial variables and their associated risk points:

- (i) Foreign Debt as a Percentage of GDP (0-10);
- (ii) Foreign Debt Service as a Percentage of Export in Goods and Services (0-10);
- (iii) Current Account as a Percentage of Export in Goods and Services (0-15);
- (iv) Net Liquidity as Months of Import Cover (0-5);

- (v) Exchange Rate Stability (0-10).

Political risk rating measures the political stability of a country, which affects the country's ability and willingness to service its financial obligations. The 12 political risk variables, and the range of risk points assigned to each, are as follows:

- (i) Government Stability (0-12);
- (ii) Socio-economic Conditions (0-12);
- (iii) Investment Profile (0-12);
- (iv) Internal Conflict (0-12);
- (v) External Conflict (0-12);
- (vi) Corruption (0-6);
- (vii) Military in Politics (0-6);
- (viii) Religious Tensions (0-6);
- (ix) Law and Order (0-6);
- (x) Ethnic Tensions (0-6);
- (xi) Democratic Accountability (0-6);
- (xii) Bureaucracy Quality (0-4).

Using each set of variables, a separate risk rating is created for the three components. The 5 variables for the economic risk rating are weighted equally to give a score of 50 points, the 5 variables for the financial risk rating are weighted equally to give a score of 50 points, and the 12 variables for the political risk rating are weighted equally to give a score of 100 points. As the composite risk rating is obtained by dividing the sum of the three component risk ratings by 2, the economic and financial components account for 25% each and the political component accounts for 50% of the composite risk rating.

In all cases, the lower (higher) is a given risk rating, the higher (lower) is the associated risk. In essence, the country risk rating is a measure of country creditworthiness. The range of the ICRG risk ratings for economic, financial, political and composite risk are 0-50, 0-50, 0-100, and 0-100, respectively. In order to facilitate direct comparison, in this paper the range of the four risk ratings is given as 0-100.

5.1 Twelve Selected Countries

The risk ratings and volatilities are discussed for twelve representative developing countries, namely Albania, Argentina, Chile, Cuba, Indonesia, Iraq, Malaysia, Mexico, Romania, Saudi Arabia, South Africa, and Zimbabwe. Following the ICRG classification method, Table 22 groups the countries in pairs according to their geographic regions. The twelve countries represent six geographical regions, namely East Europe (Albania, Romania), South America (Argentina, Chile), North and Central America (Cuba, Mexico), East Asia and the Pacific (Indonesia, Malaysia), Middle East and North Africa (Iraq, Saudi Arabia), and Sub-Saharan Africa (South Africa, Zimbabwe). Data for these countries have been collected since January 1984, apart from Albania and Cuba, for which the data are available from October 1985, and Romania, for which the data are available from August 1984. Each of these countries generally has a low risk rating for each of the four categories, which is consistent with a high associated risk.

[Table 22]

5.2 Risk rating indexes and volatilities

Risk rating indexes and volatilities for the twelve representative countries are given in Figures 1a-12a. For each country, the risk rating indexes and volatilities are denoted ECO-R, FIN-R, POL-R, and COM-R for the economic, financial, political and composite risk rating indexes, respectively. Defining volatility as the squared deviation of each observation from the respective sample mean risk rating index, the four volatilities are denoted ECO-V, FIN-V, POL-V, and COM-V.

The descriptive statistics for the four risk ratings by country are given in Table 23, in which the twelve countries are ranked according to their means for the economic, financial, political and composite risk ratings. In this group of countries, Iraq has the lowest mean risk ratings in all four risk categories, and hence is ranked last, while Malaysia has the highest mean risk ratings in all four risk ratings, and hence is ranked first. The rankings are generally similar across the four risk ratings, with a mean range of 3 and a mode of 2. Argentina (3 to 9), Indonesia (5 to 11) and Saudi Arabia (2 to 8) have the highest range of 6 from the lowest to the highest ranking across the four risk

ratings. In terms of the mean rank for the four risk ratings, Malaysia is followed by Chile, {Mexico, Saudi Arabia}, South Africa, Argentina, {Indonesia, Romania}, Albania, Zimbabwe, Cuba, and Iraq.

[Table 23]

The risk rating indexes and associated volatilities for the twelve countries are given in Figures 1a-12a. There are substantial changes in the means of the risk rating indexes, as well as in their associated volatilities. Information on the economic and political profiles and backgrounds for the twelve representative countries is taken from three sources, namely the Australian Department of Foreign Affairs and Trade: Country, Economy and Regional Information [<http://www.dfat.gov.au/geo/index.html>], The Economist: Country Briefings [<http://www.economist.com/countries/>], and The World Factbook 2002, prepared by the Central Intelligence Agency [<http://www.odci.gov/cia/publications/factbook/index.html>].

In Figure 1a, the four risk rating indexes for Albania follow a similar pattern, with discernable clustering of volatilities from 1991 to 2000. Prior to 1990, Albania was a communist country with a closed economy, so that the four risk rating indexes are low, with little or no variation. However, by 1990 changes in the former communist bloc had also begun to influence Albania, with the social and economic life of the country about to collapse. At the beginning of 1991, clashes between Communists and their opponents occurred throughout the country, with a noticeable decrease in the four risk rating indexes in 1991, associated with peaks in volatilities. Consequently, in March 1992 the Albanian Democratic Party won the elections and began a program of market economic and democratic reforms. Until 1997 the four risk rating indexes increased, after which they dropped substantially. The collapse of the pyramid financial schemes caused panic in the country and led to the fall of the Democratic Party government, with the Socialist Party coming to power in June 1997. From 1998 the economic risk rating index increased and then remained flat. After the financial crisis, the financial risk rating index increased and remained flat. Albania remained politically unstable until 2000, after which the political risk rating index was flat, with little variation. As a weighted sum of the three indexes, the composite risk rating index has an increasing trend from 1998 to 2000, after which the index remained flat.

The risk rating indexes and their associated volatilities for Argentina are given in Figure 2a. There is a similar pattern, with discernable clustering of volatilities, for the economic, political, and composite risk rating indexes. They start at very low values and follow a generally increasing trend until 1999, after which the indexes return to their original values. Similarly, the financial risk rating index increased to 1995 and then decreased, with associated clustering of volatilities. The low risk rating indexes in the 1980s were the result of protectionist and populist economic policies in the post-war era that led to economic stagnation and hyperinflation. When Carlos Menem was elected President in 1989, he abandoned the former policies in favour of market economics and liberalisation, resulting in a period of rapid growth. His failure to deepen fiscal and structural reforms in his second term from 1995 to 1999 left the economy vulnerable to a series of shocks from 1997 to 1999. For the next two years until December 2001, the new government was unable to halt the economic decline, and so collapsed amid violent protests. A new government was elected in the beginning of 2002 and Argentina remained in deep economic, financial, and political crises, with a low associated composite risk rating index.

Figure 3a presents the risk rating indexes and their associated volatilities for Chile. As in the case of Argentina, the four risk rating indexes for Chile were very low in 1984, but had improved substantially by May 2002. They remained low and flat until 1987, after which the four indexes followed an increasing trend and then a decrease, with virtually no change in the financial risk rating index between 1991 and 1997. There are discernable clusterings of volatilities for the four indexes. Chile has one of the most open economies in the world, with economic reforms, such as privatisation, liberalisation and deregulation of trade and investment, having been initiated by the military government and continued by subsequent democratic administrations. The economic risk rating index fell in 1998 and remained low in 1999 as a result of the economic recession. After a period of stability, the financial risk rating index also fell and remained low, with little variation but with a downward trend. Changes in the political situation in December 1988, when Augusto Pinochet failed to win a majority in a referendum, led to a democratic election in December 1989. Since then, there have been three consecutive presidents from the Concertacion de Partidos por la Democracia coalition. The political risk rating index decreased in 1998 before increasing in 2000, due to the detention of Pinochet in London in response to an

extradition request by Spain. This period witnessed demonstrations by supporters and opponents of Pinochet, which led to clashes with the police.

Risk rating indexes and volatilities for Cuba are presented in Figure 4a. Cuba has been a communist country since Fidel Castro led his army to victory in 1959. There was a decreasing trend in the four risk rating indexes until 1992, after which the economic, financial and composite risk rating indexes increased, while the political risk rating index increased and decreased before increasing again in the last two years. The falling economic, financial and composite risk rating indexes are due to the withdrawal of the former Soviet aid as well as domestic incompetence, which led to a severe economic recession in 1990 to 1992. After 1992, Cuba was slowly recovering, but standards of living have remained low. The implementation by the USA of the Helms-Burton legislation against trade with and investment in Cuba in 1996 led to a decreasing political risk rating index. There are discernable clusterings of volatilities for the four risk rating indexes, with the trend and variation of the composite risk rating index reflecting those of the economic and financial risk rating indexes.

For Indonesia in Figure 5a, the economic risk rating index has a slightly increasing trend with no variation until 1997, when the country was hit by the economic and financial crises that afflicted a number of South-East Asian countries. The economic risk rating index remained low until 1999, associated with high volatilities, and then increased and remained flat. There was no trend but there was substantial volatility for the financial risk rating index until 1988, after which the index increased and remained high until the 1997 crises, but with greater variation since 1999. The political scenario of Indonesia has also been volatile, with the political risk rating index improving substantially from 1988 to 1997, after which the index fell and remained low, but with high variation. Such a fall in the political risk rating index was due to Soeharto, who presided over 32 years of authoritarian politics, having been forced out in May 1998, amid deepening economic, financial and social crises. In 2001, there was a peak in the associated volatility, when President Wahid was impeached on the grounds of incompetence and replaced by President Soekarnoputri. As a weighted mean of the three indexes, the composite risk rating index reflects the financial and political risk rating indexes. There is comparable volatility in the composite risk rating index relative to the financial and political risk rating indexes.

The four risk rating indexes for Iraq in Figure 6a are all very low. Although Iraq is an oil-rich country, the war with Iran from 1980 to 1988 seriously damaged its oil export facilities, leading to the economic risk rating index falling by almost 20 points in 1988. The index followed an increasing trend from 1988 to 1991, as new pipelines were constructed, the damaged facilities were repaired, and oil exports gradually increased. Iraq's seizure of Kuwait in 1990, and the 1991 war with the US-led UN coalition, resulted in international economic sanctions. During this period, the economic risk rating index dropped by 30 points, after which it followed an increasing trend. There was no trend and little variation in the financial risk rating index to 1990, with the index being very low during this period. In the 1980s, financial difficulties caused by massive expenditures in the eight-year war with Iraq led to the implementation of austerity measures, heavy borrowing, and subsequent debt rescheduling. From 1991 to 1994, the financial risk rating index was virtually flat at a very low level, after which it had an increasing trend associated with increasing volatilities. The end of the war with Iran in 1988 saw an increase in the political risk rating index, followed by a drop in the index during the Gulf Crisis from 1990 to 1992. There was a clustering of volatilities in the three-year period, after which the political risk rating index had an increasing trend, with little variation. The composite risk rating index followed a similar trend relative to the political risk rating index, with associated clustering of volatilities.

In Figure 7a, the country risk rating indexes for Malaysia are similar to those for Indonesia, as are their associated volatilities, but not the political risk rating index. The economic risk rating index followed an increasing trend until the eruption of the economic and financial crises of 1997, after which the index fell, reaching the low sixties in 1998, associated with a peak in volatility. During 1998, the government's response to the growing crises focused on expansionary measures to revive the economy. A range of capital controls was implemented to restrict the flow of capital in and out of Malaysia, and the ringgit was pegged against the US dollar. In 1999, the economic risk rating index started to increase as the capital control measures were eased to restore foreign investor confidence. The index increased up to 2000 as the economy recovered strongly in 1999 and 2000, after which the economic risk rating index followed a downward trend, reflecting the impact of the global economic downturn. As in the case of Indonesia, the financial risk rating index was also affected by the economic and financial crises of 1997. However, the index for Malaysia

increased in the same year, with an associated peak in volatility, and remained flat after 1999. The political scenario for Malaysia is different from Indonesia, with the index being less volatile for Malaysia. It is noticeable that the 1997 crises led to a fall in the political risk rating index until 1998, after which the index followed an upward trend. The composite risk rating index closely reflected the patterns and variations of the financial and political risk rating indexes.

Patterns in the risk rating indexes and volatilities for Mexico in Figure 8a are similar for all indexes, but differ from those of Cuba. Two decades ago, Mexico was closed to foreign investment and trade, with the direct involvement of the government in the economy. Massive external debt default in 1982, the 1984 oil price crisis, and the accession to the GATT in 1986, are reflected in the movements of all four risk rating indexes, which followed a decreasing trend to 1986. The upward trend after 1986 was due to the initiation of economic reforms by the government, including trade and investment liberalisation, privatisation, deregulation and fiscal consolidation. From 1988 to 1994, President Salinas began the process of restructuring the economy, which was continued by the Zedillo administration from 1994 to 2000. These reforms and growing ties with the USA led to a period of relatively strong growth and stability in the Mexican economy. In the case of the financial risk rating index, the 1994 peso crisis led to a fall in the index, which increased then decreased in 1997. However, the economy recorded a contraction in 2001, which affected the economic, political and composite risk rating indexes, but not the financial risk rating index. The economic downturn was attributed to the economic slowdown in the USA and the events of September 11, 2001 that led to increased caution towards goods crossing the USA border and a large decline in tourism numbers.

Figure 9a presents the risk rating indexes and their associated volatilities for Romania, the other country from East Europe. Romania has similar patterns for the financial, political and composite risk rating indexes, and substantial volatility throughout the sample. After the fall of the Ceausescu Communist regime in 1989, the financial, political and composite risk rating indexes began to increase, while the economic risk rating index decreased until 1991, after which the index followed a generally increasing trend. As reflected in the decreasing trend for the economic risk rating index, Romania entered a period of deep recession in mid-1997, from which it started to emerge in 1999. The financial risk rating index fell in 1997 as a result of the

recession, and remained unstable thereafter. Two major political changes occurred in Romania after the popular revolution of 1989, which were associated with downward movements in the political risk rating index and increasing volatility. These were the electoral defeat in 1996 of the former Communists, who came to power after Ceausescu's fall, and the 2000 elections, which saw the former Communists returned to power. Under new President Iliescu, the political situation has become stable, as shown by the flat political risk rating index, and low associated volatility.

Risk rating indexes and their associated volatilities for Saudi Arabia, the other country from Middle East and North Africa region, are given in Figure 10a. The patterns for Saudi Arabia are distinctly different from those of Iraq, with noticeable structural changes for all risk rating indexes, except for the economic risk rating index. As an oil-based economy, Saudi Arabia has been ruled as an absolute monarchy since it was formed in 1932. The economic risk rating index followed an increasing trend for most of the sample. However, from 1997 to 1999, low oil prices slowed down the state-led industrial development, causing the index to fall. In 2000, the economic risk rating index started to increase, due to high oil prices, and fell again in 2001, due to the sharp fall in oil prices. The Gulf Crisis in early 1991 was associated with structural changes for the financial, political and composite risk rating indexes. Such changes indicated that after 1991, Saudi Arabia has been regarded as a safer country with respect to financial, political and composite risk.

The risk rating indexes and their associated volatilities for South Africa and Zimbabwe, the two Sub-Saharan countries, are given in Figures 11a-12a, respectively. South Africa and Zimbabwe displayed different patterns for the four risk rating indexes. There was a generally increasing trend in all four risk rating for South Africa, which is a middle-income developing country with daunting economic problems inherited from the apartheid era, especially poverty and lack of economic empowerment among the disadvantaged groups. The declining trend in all four risk ratings for the period 1994-1999 was due to the low growth, high unemployment, and problems such as skyrocketing crime, corruption, and HIV/AIDS. In early 2000, the four rating indexes started to increase as President Mbeki vowed to promote economic growth and foreign investment, and to reduce poverty by relaxing restrictive labor laws, increasing the pace of privatization, and reducing governmental spending. The economy slowed in 2001 as a result of the slowing of the international economy.

Zimbabwe had a generally declining trend in the risk rating indexes in Figure 12a, apart from the financial risk rating index, which was highly volatile. Robert Mugabe, the nation's first prime minister and president since 1987, has been the country's sole ruler and has dominated the political system since the country gained independence. Earlier moves to develop a market-oriented economy led to a reduction in the economic risk rating index, and an associated volatility peak in 1992. The index followed an increasing trend after 1992, but started to decline in 1997, with increasing volatility. Similarly, while the financial risk rating varied substantially throughout the sample period, its associated volatility was higher in the second half of the sample period because the IMF support had been suspended due to Zimbabwe's failure to meet budgetary goals. Moreover, the economy had been steadily weakened by excessive government deficits, AIDS, rampant inflation, and extremely unequal income distribution. The government's land reform program, characterized by chaos and violence, derailed the commercial sector, which had been a traditional source of exports, foreign exchange and employment. Politically, Zimbabwe had been improving, as shown by the increasing trend in the political risk index to 1998. However, its involvement in the war in the Democratic Republic of the Congo, which began in 1998, contributed to its domestic woes and thereby caused the index to exhibit a declining trend.

5.3 Risk rating returns and volatilities

Risk returns are defined as the monthly percentage change in the respective risk rating indexes. The descriptive statistics for risk returns by country are given in Table 24, and the correlation coefficients for risk returns by country are given in Table 25. For each country the risk returns in Figures 1b-12b are denoted ECO-R, FIN-R, POL-R and COM-R for the economic, financial, political and composite risk returns, respectively. Defining volatility as the squared deviation of each observation from the respective sample mean risk return, the four volatilities associated with the risk returns are denoted ECO-V, FIN-V, POL-V and COM-V, respectively.

Table 24 reports the descriptive statistics for the four risk returns by country. All the means of the four risk returns for the twelve countries are close to zero with standard deviations ranging from 0.0205 (Indonesia) to 0.1117 (Iraq) for economic risk returns, 0.0202 (Chile) to 0.1391 (Iraq) for financial risk returns, 0.0130 (Malaysia) to 0.0558

(Iraq) for political risk returns, and 0.0103 (Indonesia) to 0.0486 (Iraq) for composite risk returns. Of the twelve countries, Iran has the highest standard deviation for the four risk returns. There is no general pattern of skewness for the four risk returns for the twelve countries, with all four risk ratings being negatively skewed for Albania and Malaysia, and all positively skewed for Saudi Arabia. While both the financial and political risk returns are positively skewed for Iraq and Zimbabwe, only the political risk returns are positively skewed for Argentina and Romania. Economic risk returns are the only positively skewed risk returns for Indonesia, but the only negatively skewed risk returns for South Africa. For Mexico, the financial and composite risk returns are both negatively skewed, for Cuba only the financial risk returns are negatively skewed, and only the composite risk returns are negatively skewed for Chile.

[Table 24]

Table 25 reports the correlation coefficients for the four risk returns by country. The economic, financial and political risk returns seem to be highly correlated with the composite risk returns, but not with each other. For eight countries, namely Albania, Argentina, Cuba, Iraq, Mexico, Saudi Arabia, South Africa and Zimbabwe, the highest correlation coefficient is between the political and composite risk returns. Of these eight countries, the second highest correlation for Albania, Cuba, Iraq and Saudi Arabia is between economic and composite risk return, while for Argentina, Mexico, South Africa and Zimbabwe the second highest correlation coefficient is between financial and composite risk returns. For Chile and Malaysia, the highest correlation coefficient is between the economic and composite risk returns, while for Indonesia and Romania the highest correlation coefficient is between the financial and composite risk returns.

[Table 25]

The risk returns and associated volatilities for the twelve countries are given in Figures 1b-12b. Substantial differences are evident in the risk returns, as well as in their volatilities. Both Albania and Romania have noticeable outliers for three of the four risk returns, the exception being political risk returns, for which there is a clustering of volatilities. Argentina has outliers in the case of financial and composite

risk returns, and clustering for the other two risk returns, whereas Chile has clustering in the case of all four risk returns. Outliers are evident in three of the four risk returns for Cuba, with the exception being economic risk returns, for which there appears to be little clustering. In the case of all four risk returns for Mexico, outliers seem to be present. With the exception of composite risk returns for Indonesia, and political risk returns for Malaysia, outliers are more obvious than clustering. There is evidence of clustering of volatilities only in the case of political risk returns for Malaysia. Volatilities seem to cluster only for economic risk returns for Saudi Arabia, with outliers seeming to dominate the remaining three risk returns. Outliers are also evident for Iraq in the case of financial and political risk returns, but with little evidence of clustering of volatilities. South Africa and Zimbabwe display different patterns. Outliers are present in all four risk returns for South Africa, and clustering for financial risk returns, whereas Zimbabwe has outliers in the case of economics and political risk returns and clustering for composite risk returns.

6. Concluding remarks

This paper evaluated the significance of 50 published empirical papers in the country risk literature according to established statistical and econometric criteria used in estimation, evaluation and forecasting. Such an evaluation permits a critical assessment of the relevance and practicality of the economic, financial and political theories pertaining to country risk. Discussion of the empirical findings relating to the published studies included descriptions of the country risk rating systems by the leading commercial analysts of country risk which were used, namely Institutional Investor, Euromoney, Moody's, Standard and Poor's, International Country Risk Guide, and Political Risk Services. The rating system of International Country Risk Guide (ICRG), which is the only risk rating agency to provide detailed and consistent monthly data over an extended period for a large number of countries, was discussed in detail. A comparison of ICRG country risk ratings, risk returns and associated volatilities was provided for twelve developing countries, representing six geographic regions. The time series data permitted a comparative assessment of the international country risk ratings, and highlighted the importance of economic, financial and political risk ratings as components of a composite risk rating.

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Table 1. Classification by Type of Data Used

Type of Data	Frequency
Pooled	34
Cross-section	16
TOTAL	50

Table 2. Classification of Pooled Data by Number of Countries

Number of Countries	Frequency
5	1
16	1
17	1
19	1
24	1
25	1
26	1
27	2
30	1
32	1
33	2
39	1
40	2
41	1
43	1
47	2
48	1
54	1
55	1
56	1
59	2
60	1
65	1
68	1
74	1
75	1
79	2
80	1
85	1
90	1
95	1
TOTAL	37

Note: Three studies used two data sets.

Table 3. Classification of Pooled Data by Number of Annual Observations

Number of Observations	Frequency
5	5
8	3
9	2
10	3
11	4
12	3
13	1
14	1
15	1
16	1
17	1
18	1
19	3
22	1
24	1
TOTAL	31

Note: One study used two annual data sets, two studies used one annual data set and one semi-annual data set, and another study used one annual data set, one semi-annual data set, and one monthly data set.

Table 4. Classification of Pooled Data by Number of Semi-Annual Observations

Number of Observations	Frequency
8	2
16	1
17	2
22	2
38	1
TOTAL	8

Note: One study used two semi-annual data sets, two studies used one annual data set and one semi-annual data set, and another study used one annual data set, one semi-annual data set, and one monthly data set.

Table 5. Classification of Cross-section Data by Number of Countries

Number of Countries	Frequency
18	1
20	1
27	1
29	1
30	1
35	1
45	2
49	1
52	1
70	2
71	1
88	1
93	1
143	1
892	1
Unstated	1
TOTAL	18

Note: One study used three data sets. The sample with 892 observations refers to municipalities rather than countries.

Table 6. Classification of Cross-Section Data by Number of Time Series Observation

Number of Observations	Frequency
1	10
2	4
3	1
4	2
5	5
7	1
8	1
10	1
11	1
20	2
23	1
TOTAL	29

Note: More than one time series data set was used in some studies.

Table 7. Classification by Type of Model

Model	Frequency
Only linear single equations	4
Only log-linear single equations	2
Both linear and log-linear single equations	2
Logit	23
Probit	10
Discriminant model	7
Tobit	3
System of equations	6
Artificial neural network model	2
Others	11
TOTAL	70

Note: More than one model was used in some studies and two studies used no model. The “Others” category includes one entry for each of multi-group hierarchical discrimination model, two-way error components model, random-effect error component equations, naïve model, combination model, G-Logit model, nested trinomial logit, sequential-response logit, unordered-response logit, classification and regression trees, and cluster analysis.

Table 8. Classification by Type of Dependent Variable Used¹

Type	Frequency
Debt rescheduling ²	36
Agency country risk ratings ³	18
Debt arrears ⁴	4
(Average) value of debt rescheduling	3
Exchange rate movements	3
Fundamental valuation ratios	3
Demand for debt	3
Supply of debt	3
Propensity to obtain agency municipality credit risk ratings	2
Public debt to private creditors	2
Total reserves	2
(Relative) bond spreads	2
Weighted average loan spread	1
Spread over LIBOR	1
Yield spreads of international bonds	1
Payment interruption likelihood index	1
Sovereign loan default	1
Credit risk rating	1
Income classification	1
Stock returns	1
Secondary market price of foreign debt	1
Dummy for debt crisis	1
TOTAL	91

Notes:

1. More than one dependent variable was used in some studies.
2. Includes variables defined as the probability of debt rescheduling (as proxy for debt default), the probability of partial reneging when a borrower has decided to reschedule, trichotomous variable of debt rescheduling, the probability of general, commercial, official, and bank debt rescheduling (in the current year or in the future), the probability of debt default, and discriminant score of whether a country belongs to a rescheduling or non-rescheduling group.
3. Refers to Institutional Investor, Euromoney, Standard and Poor's, Moody's, and Economist Intelligence Unit country or municipality credit risk ratings, and average agency country risk ratings.
4. Includes one entry for each of limit on debt arrears, dummy for significant debt arrears, probability of experiencing significant debt arrears, and probability of emerging debt-servicing arrears.

Table 9. Classification by Number of Economic and Financial Explanatory Variables

Number	Frequency
2	3
3	3
4	4
5	2
6	7
7	3
8	5
9	2
10	2
11	1
12	6
13	3
14	1
15	1
16	3
18	1
20	1
23	1
32	1
TOTAL	50

Note: Country risk indicators are treated as economic and/or financial variables.

Table 10. Classification by Number of Political Explanatory Variables

Number	Frequency
0	30
1	4
2	4
3	1
4	2
5	2
6	3
8	1
10	1
11	1
13	1
TOTAL	50

Note: Regional differences are treated as political variables.

Table 11. Classification by Recognition of Omitted Explanatory Variables

Number Omitted	Frequency
0	30
1	13
2	2
3	2
4	2
8	1
TOTAL	50

Note: The classification is based on explicit recognition of omitted explanatory variables, and is used primarily as a check of consistency against the number of proxy variables used in the corresponding studies.

Table 12. Classification by Type of Omitted Explanatory Variables

Omitted Variable	Frequency
Economic and financial factors	28
Political factors	11
TOTAL	39

Notes: The various omitted variables are classified according to whether they are predominantly economic and financial or political in nature.

Table 13. Classification by Number of Proxy Variables Used

Number	Frequency
0	2
1	7
2	4
3	2
4	1
5	1
6	2
7	1
TOTAL	20

Note: Two studies explicitly recognized the omission of explanatory variables but used no proxy variables.

Table 14. Classification by Type of Proxy Variables Used

Proxy Variables	Frequency
Economic and financial factors	34
Political factors	15
TOTAL	49

Note: Some studies used economic, financial and political proxy variables.

Table 15. Classification by Method of Estimation

Method	Frequency
OLS	14
ML	35
Heckman's two-step procedure	2
Discriminant methods	3
Others	17
TOTAL	71

Note: More than one estimation method was used in some studies. The "Others" category includes entries for, among others, propagation algorithm, regression-based technique, approximation, minimax, Bayesian, optimal minimum distance, stepwise optimisation, binary splits, jack-knife methods, and OLS and WLS.

Table 16. Classification by Use of Diagnostics

Type of Diagnostics	Frequencies
None	42
Others	8
TOTAL	50

Note: The "Others" category includes entries for WLS and heteroscedasticity, White's standard errors for heteroscedasticity, White's covariance matrix for heteroscedasticity, Chow test, transformation for non-normality, Hajivassiliou test for exogeneity, and serial correlation.

Table 17. Risk Component Variables Used in Country Risk Ratings

Variables	Frequency
Economic	15
Financial	16
Political	10
Composite	17
Number of Studies	17

Table 18. Frequency of Risk Component Variables Used in Country Risk Ratings

Risk Components Used	Frequency
4	10
3	4
2	3
1	0
Total	17

Table 19. Agency Data Used

Agency	Frequency
Institutional Investor	13
Euromoney	6
Moody's	2
Standard and Poor's	2
International Country Risk Guide	2
Economist Intelligence Unit	1
Political Risk Services	1

Note: Some studies used data from more than one agency.

Table 20. Types of Variables Used in Debt Rescheduling

Variables	Frequency
Economic	27
Financial	27
Political	9
Number of Studies	27

Table 21. Frequency of Types of Variables Used in Debt Rescheduling

Risk Components Used	Frequency
3	9
2	18
1	0
Total	27

Table 22. ICRG Classification of Countries by Geographical Region

Country Pairs	Selected from Geographic Region
Albania, Romania	East Europe
Argentina, Chile	South America
Cuba, Mexico	North and Central America
Indonesia, Malaysia	East Asia and the Pacific
Iraq, Saudi Arabia	Middle East and North Africa
South Africa, Zimbabwe	Sub-Saharan Africa

Table 23. Descriptive Statistics for Risk Ratings by Country

Country	Risk Ratings	Mean	SD	Skewness	Minimum	Maximum	Ranking
Albania	Economic	47.43	14.57	-0.64	16	74	10
	Financial	63.57	6.86	-1.28	42	70	7
	Political	61.17	5.16	-0.82	46	71	7
	Composite	58.33	6.52	-1.18	41	69	7
Argentina	Economic	53.33	19.45	-0.02	21	84	8
	Financial	52.23	20.27	-0.41	16	78	9
	Political	66.35	8.32	-0.25	50	78	3
	Composite	59.56	13.45	-0.35	36	76	6
Chile	Economic	67.46	12.95	-0.56	41	84	4
	Financial	73.32	12.93	-0.96	45	86	2
	Political	65.19	12.27	-0.53	43	83	4
	Composite	67.79	12.05	-0.81	44	84	2
Cuba	Economic	44.09	15.75	0.38	24	72	11
	Financial	48.89	11.42	-0.03	32	64	11
	Political	59.12	4.44	0.11	52	69	9
	Composite	52.81	8.20	-0.02	41	65	10
Indonesia	Economic	66.59	9.47	-1.96	36	77	5
	Financial	64.49	16.84	-0.10	36	88	6
	Political	50.78	8.98	0.43	39	67	11
	Composite	58.16	9.67	0.07	41	72	8
Iraq	Economic	42.33	11.22	-0.51	21	59	12
	Financial	29.07	17.68	0.59	4	66	12
	Political	32.54	5.82	-1.28	16	41	12
	Composite	34.12	7.18	0.35	20	49	12
Malaysia	Economic	78.97	5.59	-0.77	61	88	1
	Financial	76.63	12.72	-0.67	52	90	1
	Political	69.46	5.80	-0.16	57	82	1
	Composite	73.63	5.83	-0.36	63	83	1
Mexico	Economic	60.97	8.02	0.00	45	80	6
	Financial	67.48	13.59	-0.43	36	88	4
	Political	68.03	3.46	-0.27	60	78	2
	Composite	66.13	6.13	-0.71	52	75	4
Romania	Economic	53.51	8.97	-0.24	30	68	7
	Financial	54.39	13.52	-0.38	30	72	8
	Political	61.17	9.61	-0.16	45	78	6
	Composite	57.56	6.52	-0.10	47	70	9
Saudi Arabia	Economic	75.33	5.99	-0.53	56	89	2
	Financial	72.86	15.94	-0.41	46	92	3
	Political	60.74	7.83	-0.39	45	73	8
	Composite	67.42	8.36	-0.36	52	81	3
South Africa	Economic	68.72	4.19	0.08	59	77	3
	Financial	66.90	9.75	-0.56	42	82	5
	Political	64.02	7.74	-0.15	49	77	5
	Composite	65.91	6.89	-0.32	51	77	5
Zimbabwe	Economic	51.11	9.77	-1.22	22	65	9
	Financial	51.98	6.18	0.59	43	67	10
	Political	53.80	9.41	-0.08	34	68	10
	Composite	52.67	6.96	0.02	38	66	11

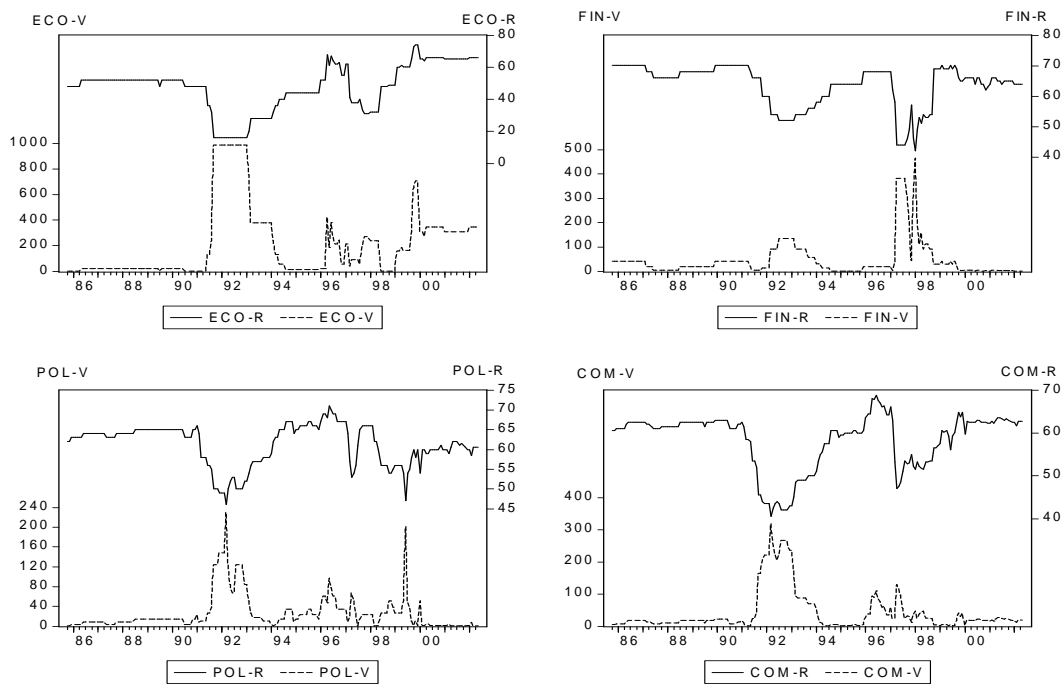
Table 24. Descriptive Statistics for Risk Returns by Country

Country	Risk Returns	Mean	SD	Skewness
Albania	Economic	0.0016	0.0853	-2.3776
	Financial	-0.0005	0.0400	-0.8775
	Political	-0.0001	0.0301	-0.5235
	Composite	0.0002	0.0276	-2.1586
Argentina	Economic	0.0026	0.0636	-0.5162
	Financial	0.0006	0.0585	-3.8034
	Political	0.0008	0.0207	0.2672
	Composite	0.0012	0.0222	-1.4046
Chile	Economic	0.0021	0.0390	0.3235
	Financial	0.0021	0.0202	0.2447
	Political	0.0021	0.0157	0.7824
	Composite	0.0021	0.0148	-0.2724
Cuba	Economic	0.0020	0.0393	0.5590
	Financial	0.0002	0.0410	-0.8419
	Political	0.0001	0.0133	1.7161
	Composite	0.0006	0.0169	2.4361
Indonesia	Economic	0.0000	0.0205	2.6154
	Financial	-0.0011	0.0310	-3.3830
	Political	-0.0007	0.0137	-0.8328
	Composite	-0.0007	0.0103	-0.7032
Iraq	Economic	0.0033	0.1117	-0.7442
	Financial	0.0036	0.1391	1.6272
	Political	0.0030	0.0558	0.8633
	Composite	0.0033	0.0486	-0.6748
Malaysia	Economic	0.0000	0.0229	-0.6627
	Financial	0.0009	0.0255	-4.9462
	Political	-0.0003	0.0130	-0.0264
	Composite	0.0000	0.0118	-1.7884
Mexico	Economic	0.0019	0.0359	0.7234
	Financial	0.0023	0.0312	-1.3627
	Political	0.0001	0.0160	0.7132
	Composite	0.0010	0.0160	-0.6843
Romania	Economic	0.0007	0.0602	-1.0832
	Financial	0.0010	0.0688	-2.5329
	Political	0.0007	0.0189	1.4416
	Composite	0.0008	0.0207	-0.7155
Saudi Arabia	Economic	-0.0003	0.0419	0.1291
	Financial	0.0013	0.0293	0.1001
	Political	0.0013	0.0266	2.0621
	Composite	0.0008	0.0203	1.2961
South Africa	Economic	0.0000	0.0221	-0.4408
	Financial	0.0000	0.0278	1.1759
	Political	0.0001	0.0205	3.1660
	Composite	0.0000	0.0140	1.6166
Zimbabwe	Economic	-0.0030	0.0498	-0.6041
	Financial	0.0010	0.0413	1.7427
	Political	-0.0005	0.0274	0.6096
	Composite	-0.0005	0.0207	-0.4461

Table 25. Correlation Coefficients for Risk Returns by Country

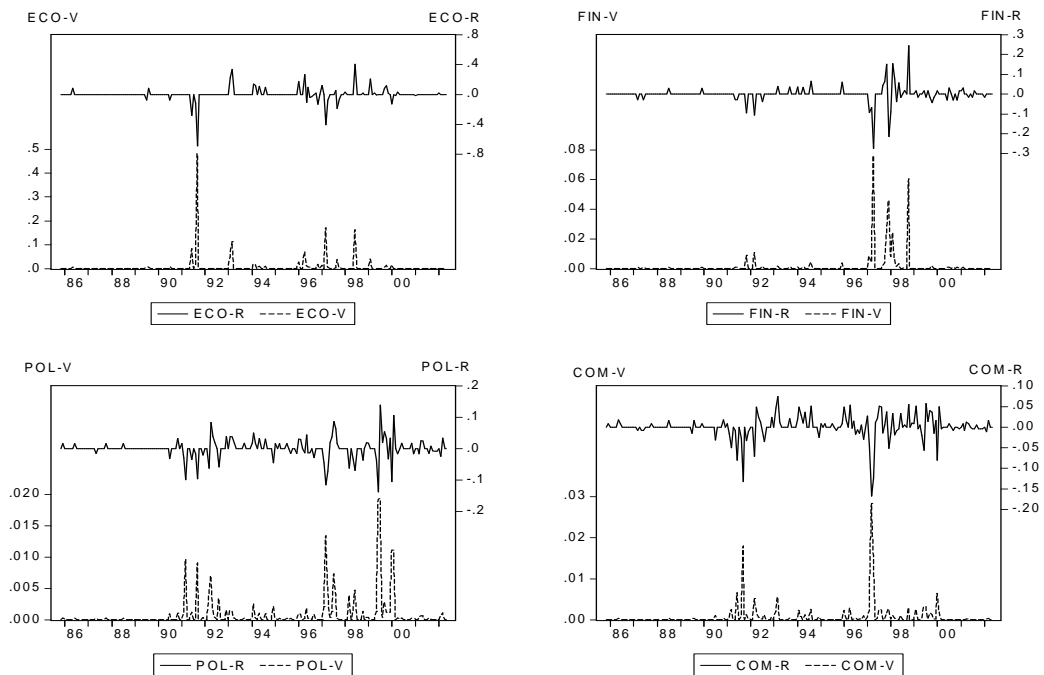
Country	Risk Returns	Economic	Financial	Political	Composite
Albania	Economic	1.000	0.077	0.312	0.725
	Financial	0.077	1.000	0.089	0.477
	Political	0.312	0.089	1.000	0.749
	Composite	0.725	0.476	0.749	1.000
Argentina	Economic	1.000	0.063	-0.021	0.581
	Financial	0.063	1.000	0.276	0.623
	Political	-0.021	0.276	1.000	0.675
	Composite	0.581	0.623	0.675	1.000
Chile	Economic	1.000	0.187	0.026	0.725
	Financial	0.187	1.000	0.227	0.592
	Political	0.026	0.227	1.000	0.618
	Composite	0.725	0.592	0.618	1.000
Cuba	Economic	1.000	0.108	0.380	0.701
	Financial	0.108	1.000	0.271	0.667
	Political	0.380	0.271	1.000	0.751
	Composite	0.701	0.667	0.751	1.000
Indonesia	Economic	1.000	0.124	0.047	0.572
	Financial	0.124	1.000	0.244	0.727
	Political	0.047	0.244	1.000	0.649
	Composite	0.572	0.727	0.649	1.000
Iraq	Economic	1.000	-0.056	0.026	0.603
	Financial	-0.056	1.000	0.205	0.520
	Political	0.026	0.205	1.000	0.653
	Composite	0.603	0.520	0.653	1.000
Malaysia	Economic	1.000	0.161	0.138	0.662
	Financial	0.161	1.000	0.094	0.640
	Political	0.138	0.094	1.000	0.641
	Composite	0.662	0.640	0.641	1.000
Mexico	Economic	1.000	0.056	0.188	0.629
	Financial	0.056	1.000	0.286	0.645
	Political	0.188	0.286	1.000	0.735
	Composite	0.629	0.645	0.735	1.000
Romania	Economic	1.000	-0.072	-0.068	0.490
	Financial	-0.072	1.000	0.017	0.676
	Political	-0.068	0.017	1.000	0.459
	Composite	0.490	0.676	0.459	1.000
Saudi Arabia	Economic	1.000	0.177	0.000	0.645
	Financial	0.177	1.000	0.289	0.638
	Political	0.000	0.289	1.000	0.675
	Composite	0.645	0.638	0.675	1.000
South Africa	Economic	1.000	0.018	-0.035	0.389
	Financial	0.018	1.000	0.159	0.601
	Political	-0.035	0.159	1.000	0.774
	Composite	0.389	0.601	0.774	1.000
Zimbabwe	Economic	1.000	-0.026	0.043	0.508
	Financial	-0.026	1.000	0.052	0.527
	Political	0.043	0.052	1.000	0.707
	Composite	0.508	0.527	0.707	1.000

Figure 1a: Risk Rating Indexes and Volatilities for Albania



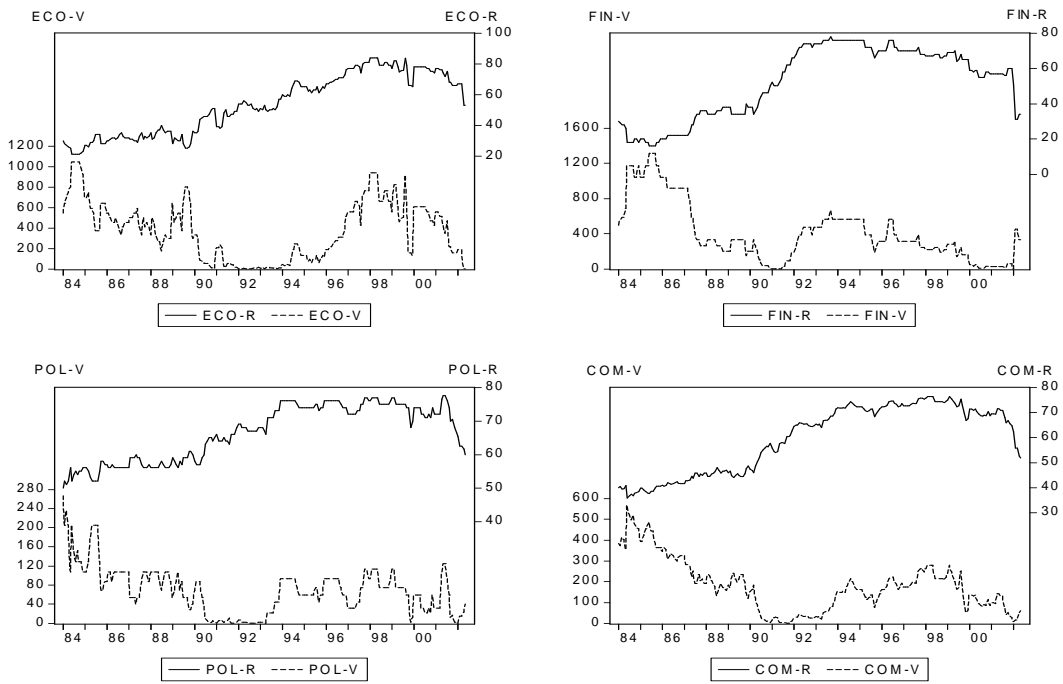
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 1b: Risk Returns and Volatilities for Albania



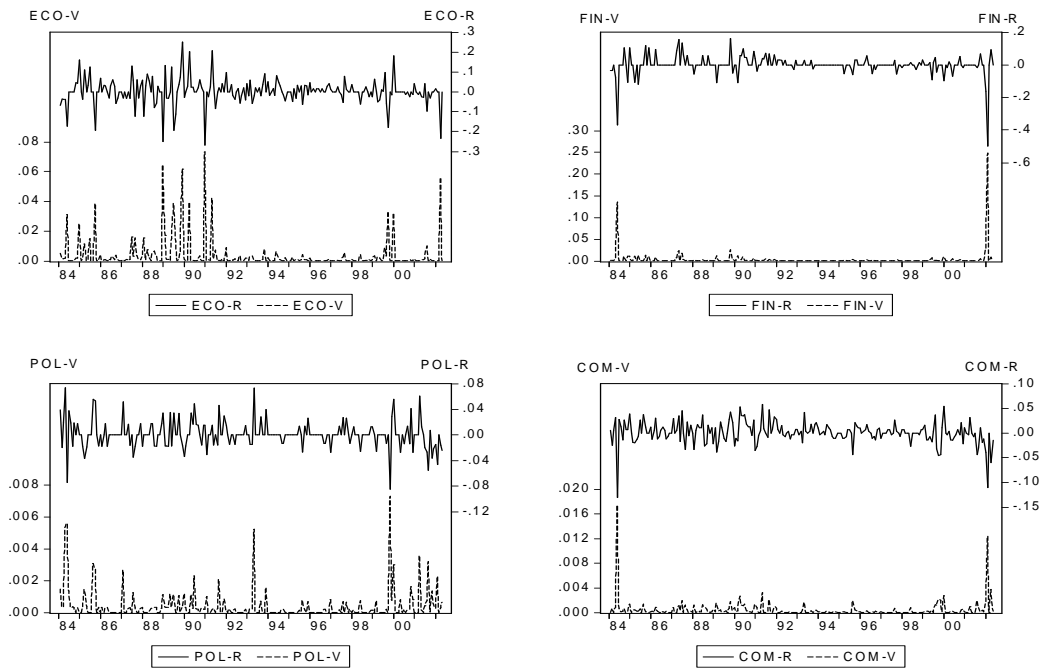
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 2a: Risk Rating Indexes and Volatilities for Argentina



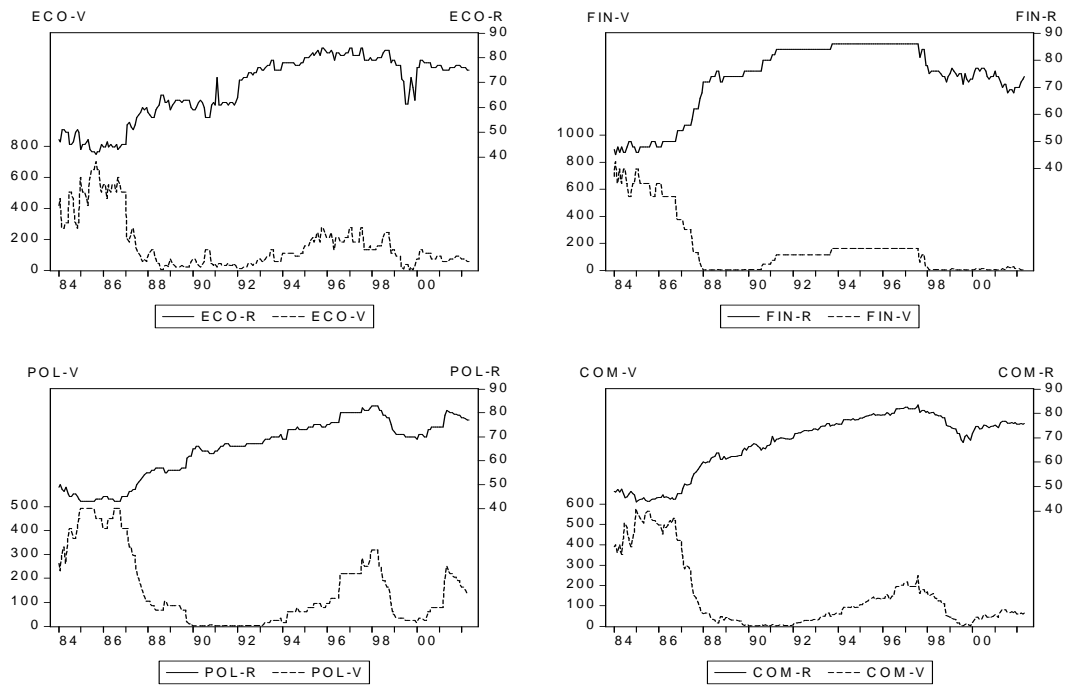
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 2b: Risk Returns and Volatilities for Argentina



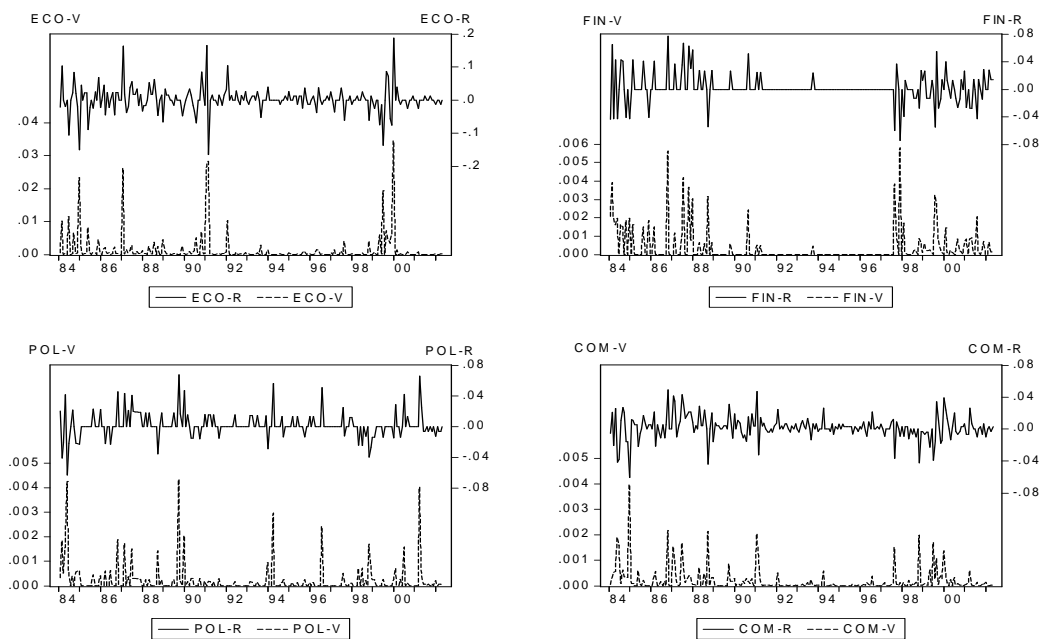
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 3a: Risk Rating Indexes and Volatilities for Chile



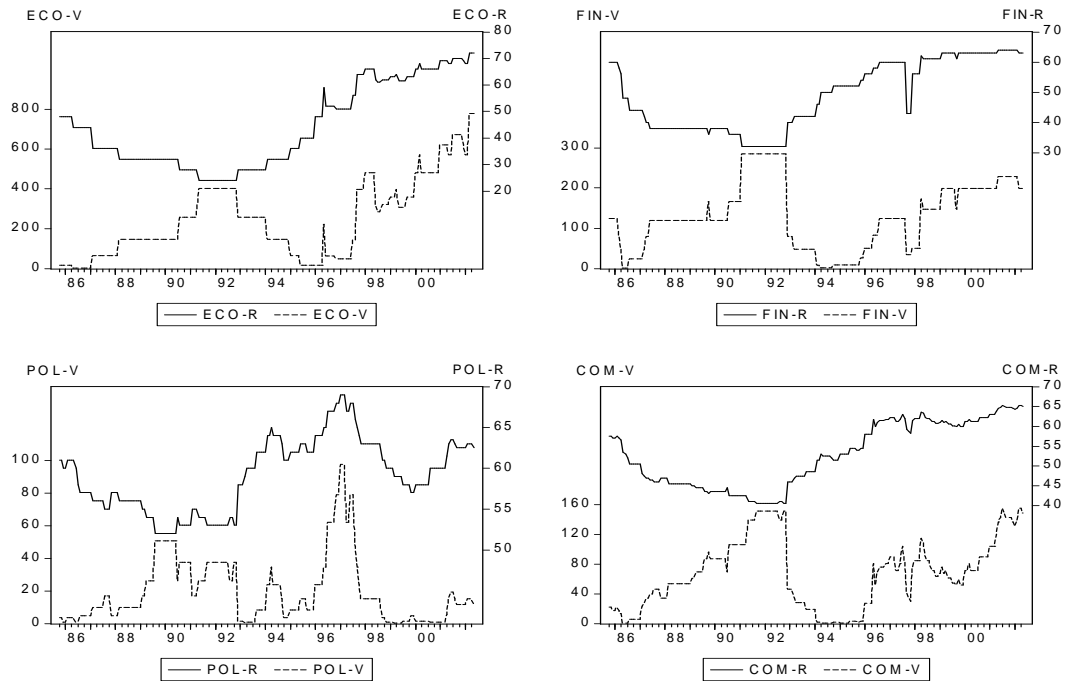
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 3b: Risk Returns and Volatilities for Chile



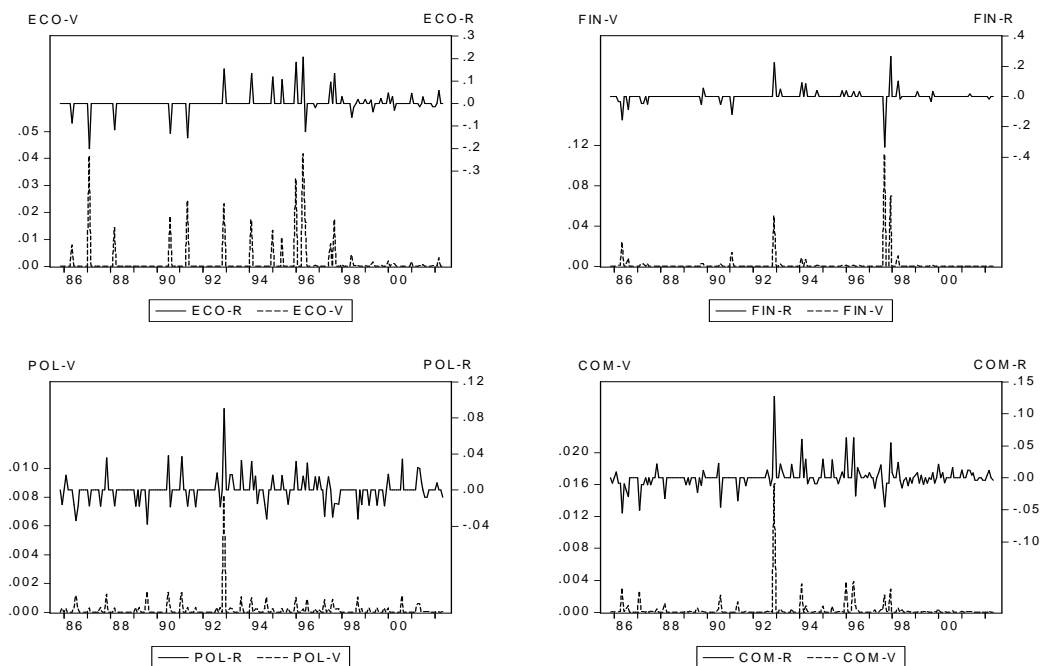
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 4a: Risk Rating Indexes and Volatilities for Cuba



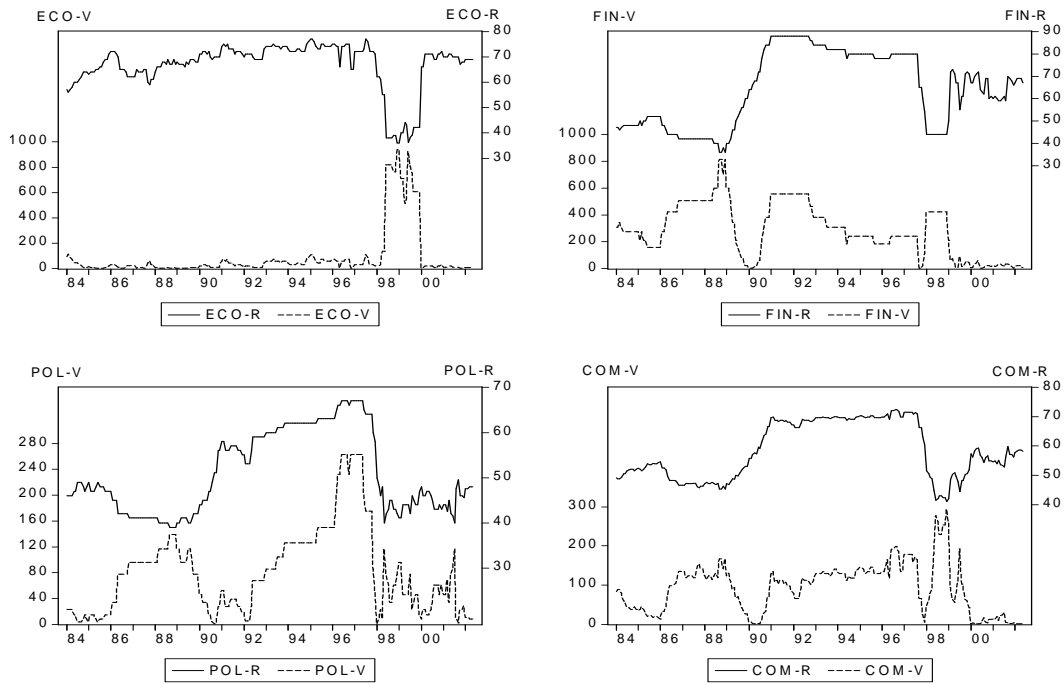
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 4b: Risk Returns and Volatilities for Cuba



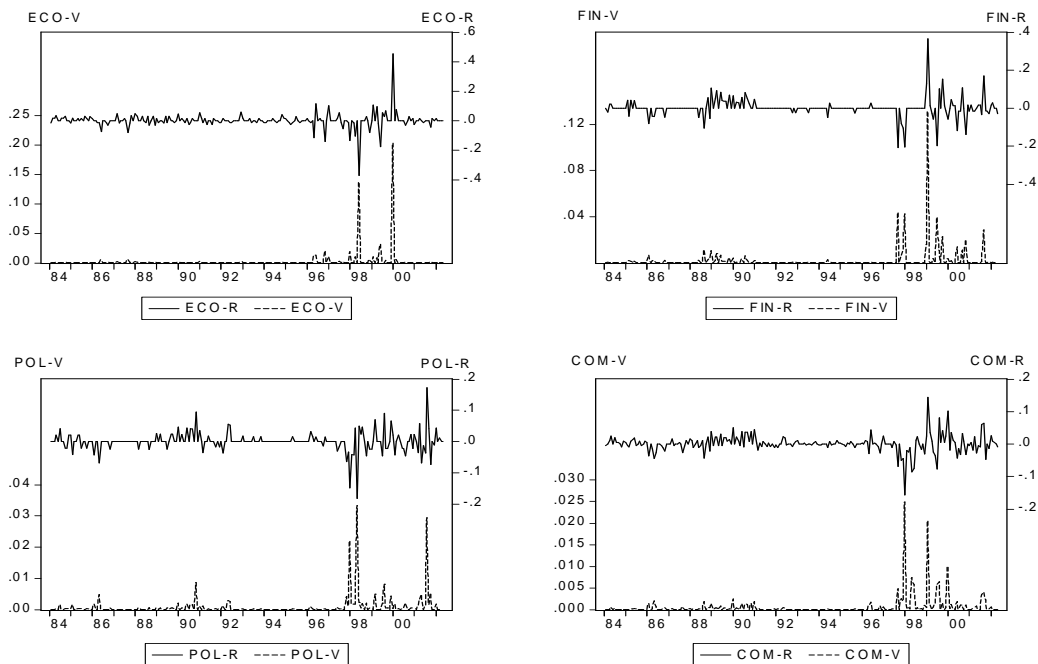
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 5a: Risk Rating Indexes and Volatilities for Indonesia



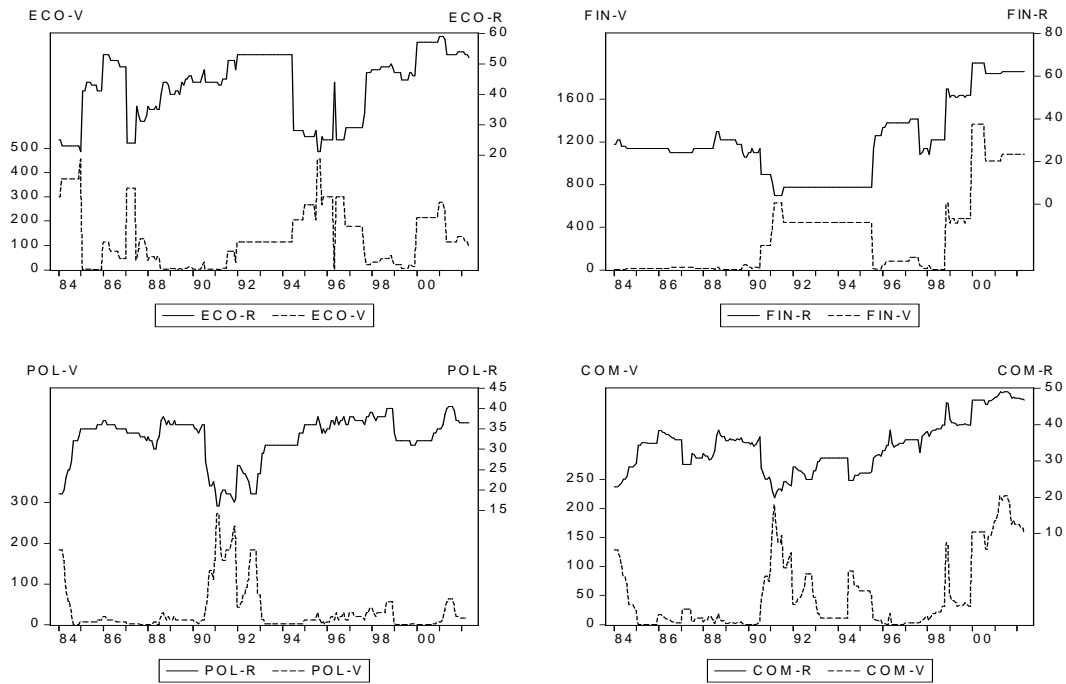
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 5b: Risk Returns and Volatilities for Indonesia



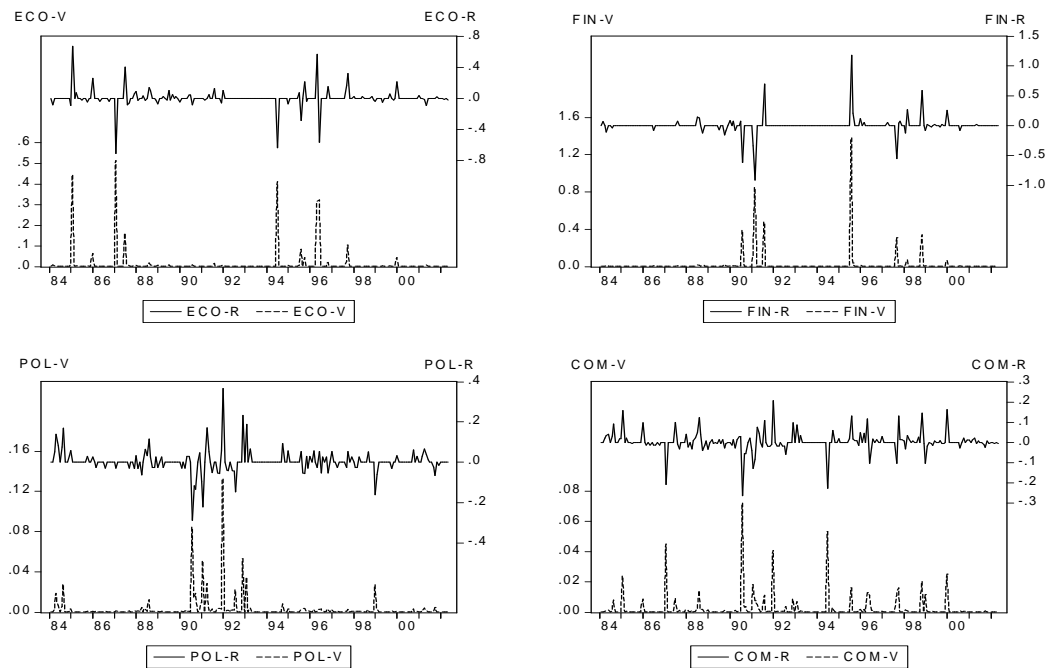
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 6a: Risk Rating Indexes and Volatilities for Iraq



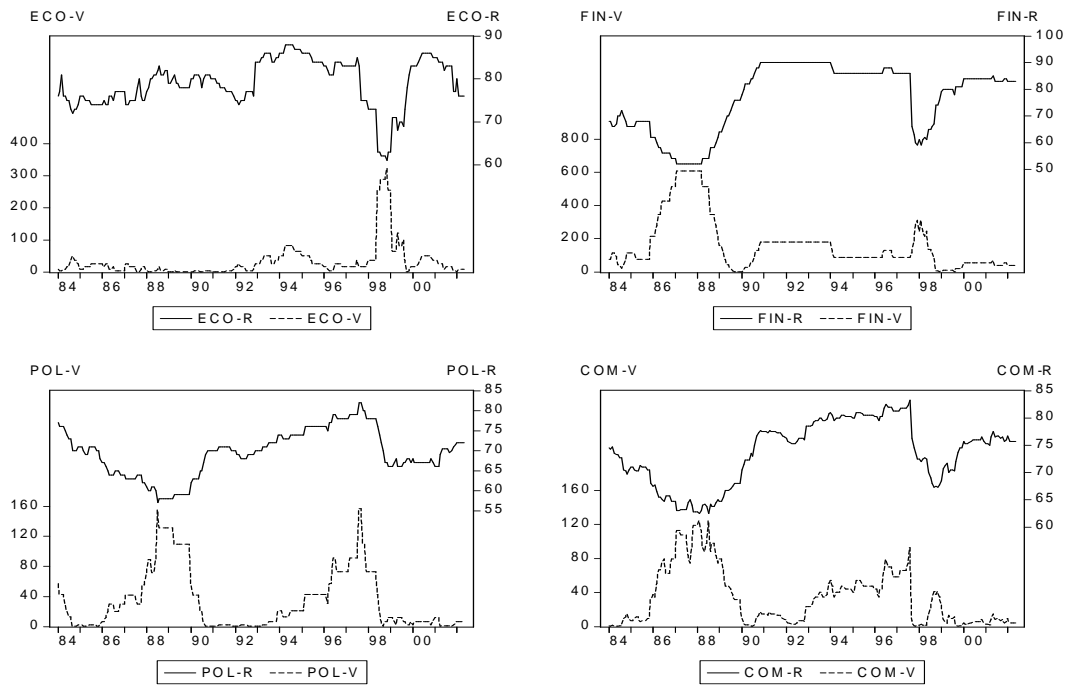
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 6b: Risk Returns and Volatilities for Iraq



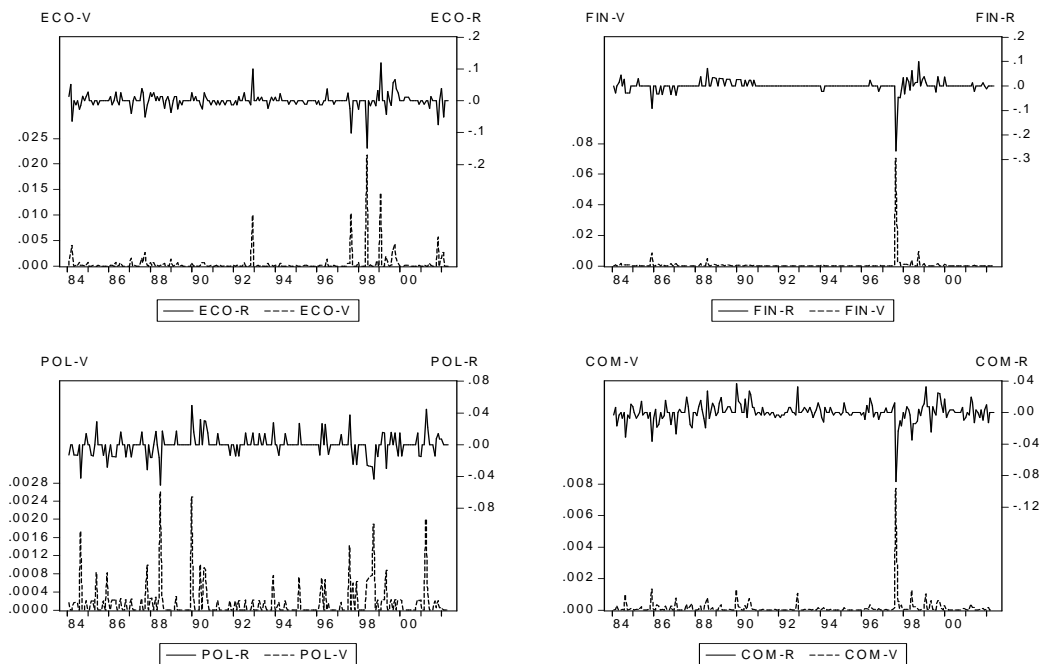
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 7a: Risk Rating Indexes and Volatilities for Malaysia



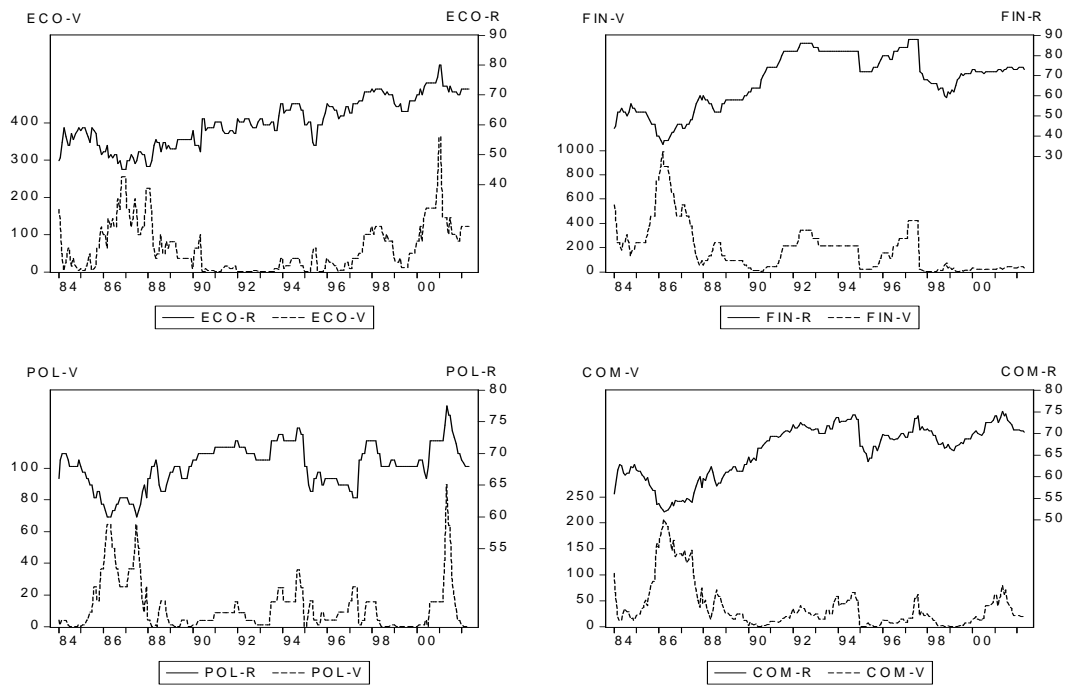
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 7b: Risk Returns and Volatilities for Malaysia



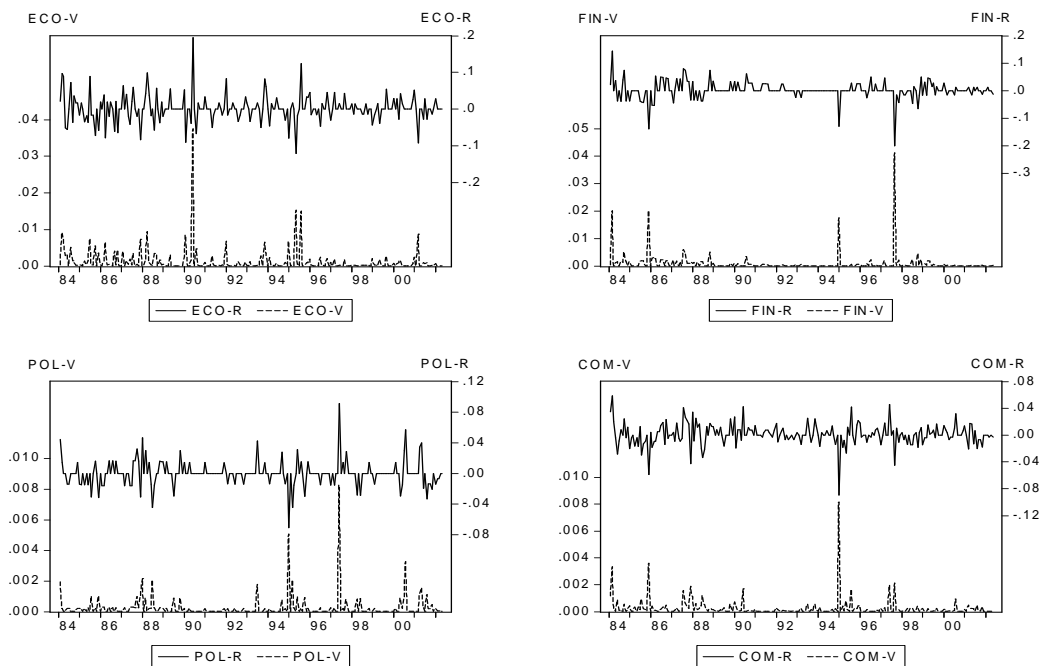
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 8a: Risk Rating Indexes and Volatilities for Mexico



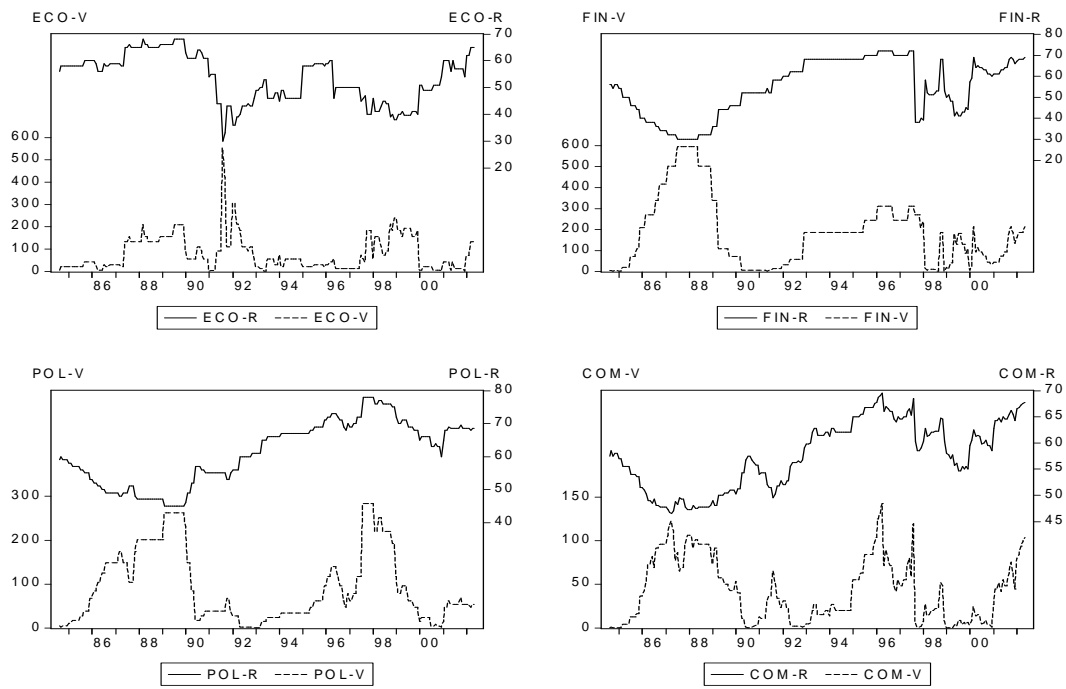
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 8b: Risk Returns and Volatilities for Mexico



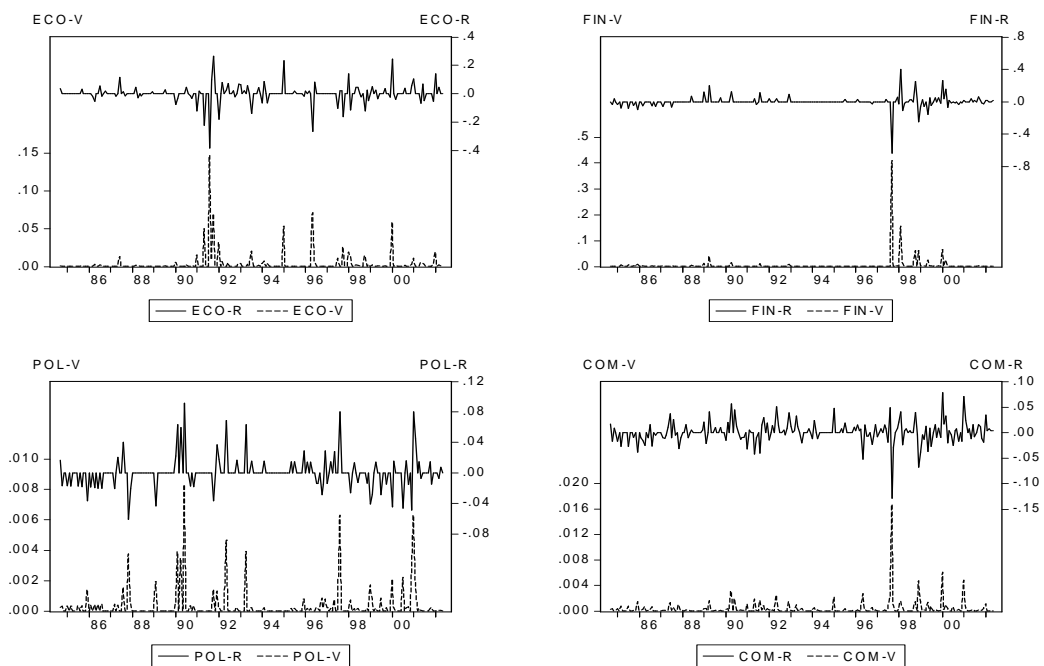
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 9a: Risk Rating Indexes and Volatilities for Romania



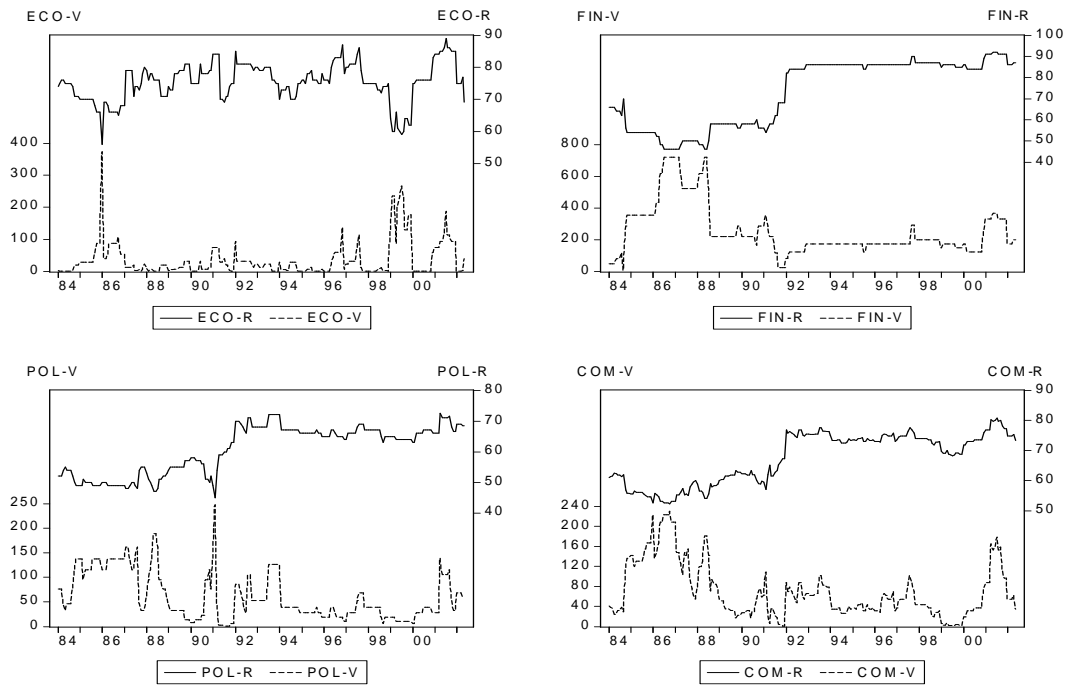
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 9b: Risk Returns and Volatilities for Romania



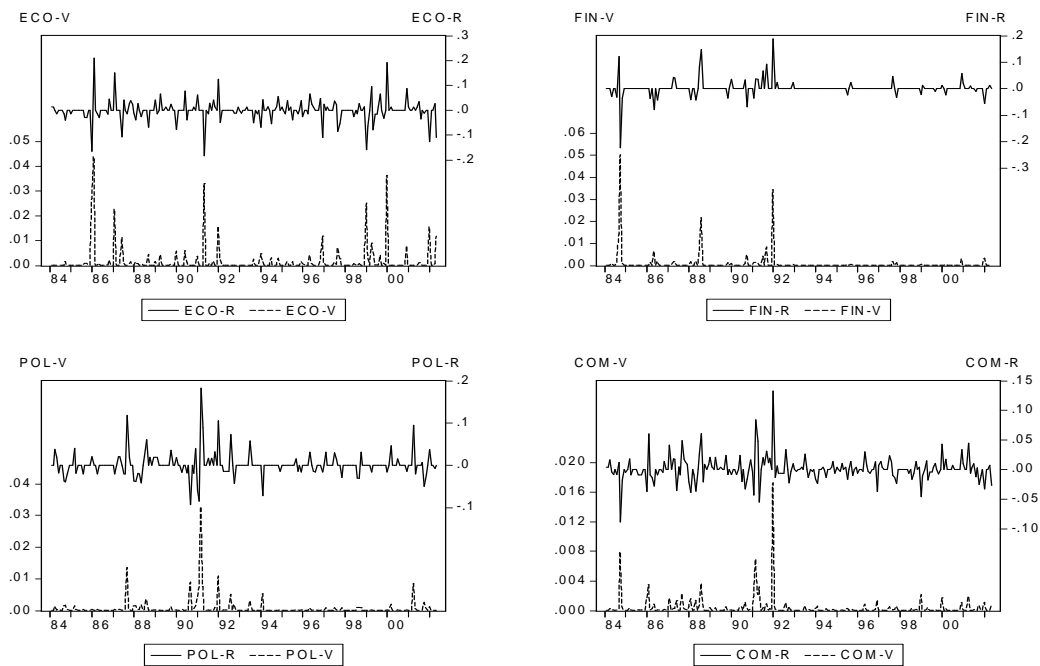
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 10a: Risk Rating Indexes and Volatilities for Saudi Arabia



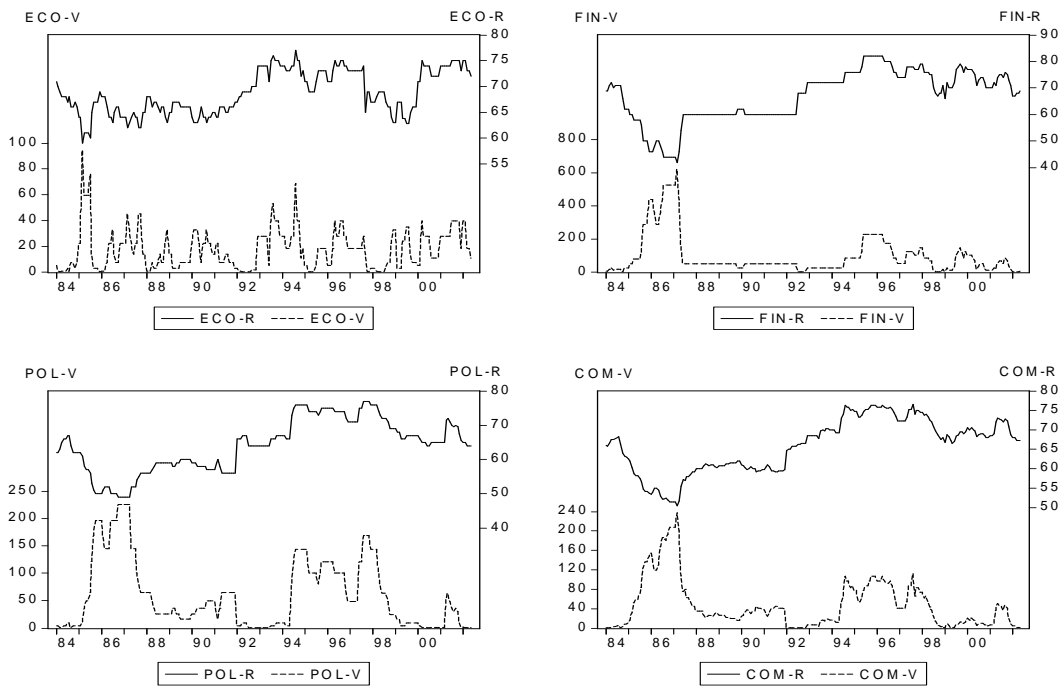
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 10b: Risk Returns and Volatilities for Saudi Arabia



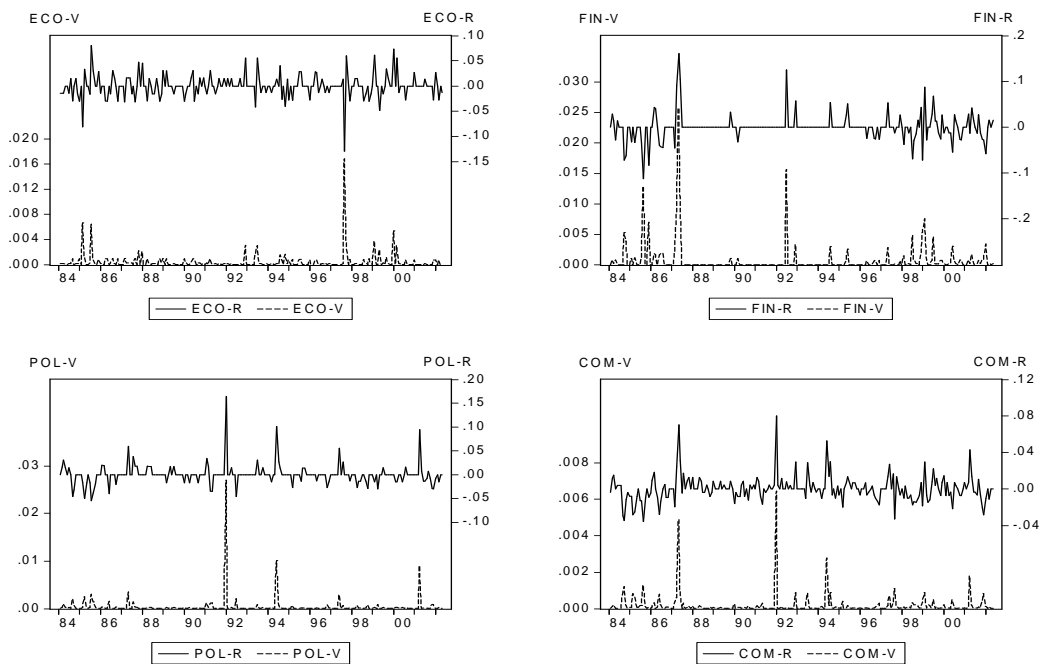
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 11a: Risk Rating Indexes and Volatilities for South Africa



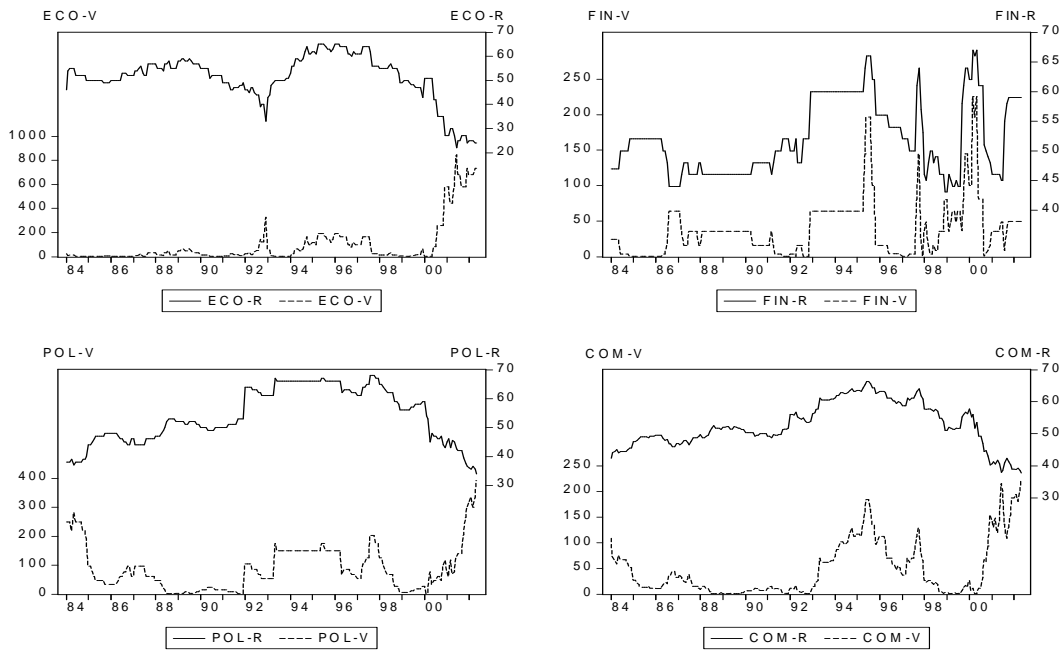
Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 11b: Risk Returns and Volatilities for South Africa



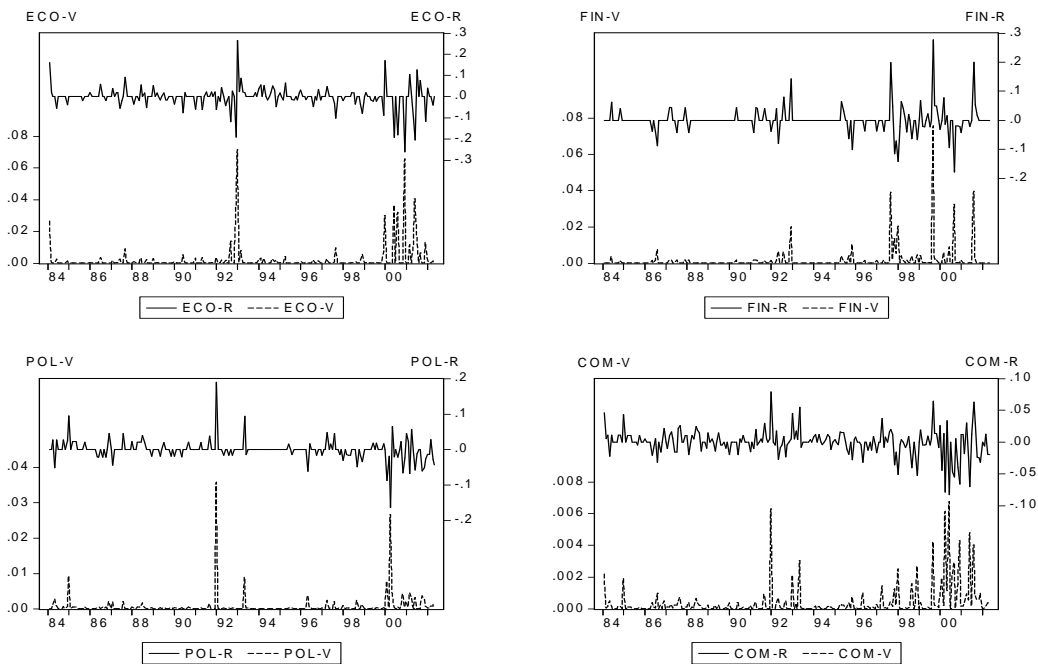
Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.

Figure 12a: Risk Rating Indexes and Volatilities for Zimbabwe



Note: Economic (ECO), Financial (FIN), Political (POL) and Composite (COM) risk rating indexes and their associated volatilities are denoted by R and V, respectively.

Figure 12b: Risk Returns and Volatilities for Zimbabwe



Note: Risk returns (R) and their associated volatilities (V) refer to the rates of change in the respective risk rating indexes.