AN EMPIRICAL MODEL OF THE INTERNATIONAL COST OF EQUITY

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ABSTRACT

AN EMPIRICAL MODEL OF THE INTERNATIONAL COST OF EQUITY

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The aim of the study is to propose an empirical model of the international cost of equity by investigating and analyzing the long-run relation between disaggregated country risk ratings and country stock market index returns for a large panel of countries. The study tests the hypothesis that, given the available theoretical and empirical evidence, country risk ratings and country stock market index returns should move together in the long-run and there should be a long-run equilibrium between them; thus country risk ratings, with their forward-looking nature about the political, macroeconomic and financial fundamentals of a large number of countries, may behave as long-run state variables for stock returns to the extent they are undiversifiable internationally. The results of the analysis provide evidence in favor of the argument that disaggregated country risk ratings, in particular the political and economic risk ratings, are related to stock market returns in the long-run. Using this relation, an empirical model of the international cost of equity is proposed. The model takes country risk ratings as inputs and finds the international cost of equity for a specific country of known risk ratings.

Keywords: International Cost of Capital, International Cost of Equity, Country Risk, International Asset Pricing

ÖZ

ULUSLARARASI ÖZKAYNAK MALİYETİ ÜZERİNE EMPİRİK BİR MODEL

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Bu çalışmanın amacı, geniş bir panel veri seti kullanarak, ayrıştırılmış ülke riski bileşenleri ile ülke hisse senedi endeks getirileri arasındaki muhtemel uzun dönemli ilişkileri araştırmak ve analiz etmek suretiyle uluslararası özkaynak maliyeti hesaplayan empirik bir model önerisinde bulunmaktadır. Çalışma, mevcut teorik ve empirik çalışmalar ışığında, ayrıştırılmış ülke riski derece notlarıyla ülke hisse senedi endeks getirilerinin uzun dönemde birlikte hareket edeceği ve aralarında uzun dönemli bir denge olacağı, dolayısıyla, ülkelerin politik, makroekonomik ve finansal değişkenleri üzerine geleceğe yönelik bakış perspektifi sunan ülke riski bileşenlerinin, çeşitlendirilemedikleri ölçüde, hisse senedi getirilerinin belirlenmesinde uzun dönemli durum değişkeni olarak davranabileceği hipotezini savunmakta ve test etmektedir. Analiz sonuçları, ayrıştırılmış ülke riski bileşenleri ile (özellikle politik ve ekonomik risk) hisse senedi endeks getirileri arasında uzun dönemli bir ilişki olduğu fikrini desteklemektedir. Bu ilişki kullanılarak empirik bir uluslararası özkaynak maliyeti modeli önerisi getirilmiştir. Model, ülke riski derece notunu girdi olarak kullanarak derece notu bilinen herhangi bir ülke için uluslararası özkaynak maliyeti hesaplamaktadır.

Anahtar Kelimeler: Uluslararası Sermaye Maliyeti, Uluslararası Özkaynak Maliyeti, Ülke Riski, Uluslararası Varlık Fiyatlama

To my family, for their endless love and support;

to my country, for her generosity;

and last but not the least,

to my daughter, Güneş, for enlightening my mind and warming my soul…

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CHAPTER 1

INTRODUCTION

1.1. Motivation

The calculation of the cost of (equity) capital in international capital markets is a long-standing problem in finance (Harvey, 2005). The Capital Asset Pricing Model (CAPM) and its multifactor versions are dominantly used in countries like the US, each yielding similar results (Harvey, 2005). Graham and Harvey (2001) find in a survey of US CFOs that 73.5% of respondents use CAPM to calculate the cost of equity. However, outside the US the results of different methods show considerable variation and there is no consensus as to how to calculate the international cost of equity.

The available international asset pricing models, such as that of Solnik (1974), generally require the assumption of world market integration and that investors hold a diversified world market portfolio. Such assumptions are hardly realistic even in developed countries, where well-functioning equity markets exist. Furthermore, for those developing and under-developed countries with no equity markets, even the existing international asset pricing models are inapplicable. Therefore, it is a challenging task for international investors to find the cross-border cost of equity in a given country.

This study aims to contribute filling this gap. While I do not propose an alternative international asset pricing theory, I aim to develop an empirical model of the international cost of equity. This is done by examining potential relations between disaggregated country risk ratings and respective country stock market index returns for a large panel of countries. Given the available theoretical and empirical evidence, I hypothesize that country risk ratings and country stock market index returns should covary in the long-run and there should be a long-run equilibrium between them (they should be cointegrated); thus country risk ratings could behave as long-run state variables for stock returns. Since country risk ratings are obtained by careful examination of country specific variables that reflect macroeconomic, financial and political fundamentals, it is plausible to think of short and long-run relations between such variables and stock markets. Indeed, "Asset prices are commonly believed to react sensitively to economic news" (Chen, Roll and Ross, 1986; p383) and "The comovements of asset prices suggest the presence of underlying exogenous influences,…" (Chen, Roll and Ross, 1986; p384)[1].

Country risk ratings used in this study assess a variety of country-specific variables from economic, financial and political perspectives. Economic risk ratings include GDP per head, real GDP growth, annual inflation rate, budget balance and current account as a percentage of GDP, while financial risk ratings include foreign debt stock, foreign debt service, current account as a percentage of exports, net international liquidity and exchange rate stability. Political risk ratings include government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tension, democratic accountability and bureaucratic quality. Taken together, these variables are good candidates for pervasive state variables. In fact, "*Macroeconomic variables are excellent candidates for these extramarket risk factors, because macro changes simultaneously affect many firms' cash flows and may influence the risk adjusted discount rate" (Flannery and Protopapadakis, 2002, p751).* The justification for this statement can be set forth using a simple theoretical framework, which was also employed by Chen, Roll and Ross (1986) (CRR) in their influential work.

Following CRR, stock prices can be written as the value of expected discounted dividends:

$$p = \frac{E(c)}{k}$$

where *E(c)* is the dividend stream and *k* is the discount rate. Thus actual return in any period is given by:

[1] Analysis conducted by Chen, Roll and Ross (1986) indeed shows that there is a long-term equilibrium between stock prices and macro variables.

$$\frac{dp}{p} + \frac{c}{p} = \frac{d[E(c)]}{E(c)} - \frac{dk}{k} + \frac{c}{p}$$

It follows that stock prices should be affected from systematic forces that influence expected cash flows and the discount rate.

According to CRR, the discount rate depends on the riskless rate, the term-structure spreads across different maturities, risk premium and indirect marginal utility of real wealth, which can be measured by real consumption changes. An intuitive examination of the country risk components reveals that economic, financial and political risk ratings include variables that are potentially relevant in systematically affecting the determinants of the discount rate. For instance, considering the components of economic risk variables, GDP per head and real GDP growth are relevant in affecting real consumption changes; annual inflation rate is relevant in affecting the riskless rate through its effect on government bond rates; budget balance and current account/GDP are relevant in affecting the risk premium, riskless rate and term-structure spreads. Considering the components of country financial risk variables, foreign debt stock, foreign debt service, current account as a percentage of exports, net international liquidity and exchange rate stability are relevant in influencing the risk premium and government bond rates (the riskless rate). Finally, the components of the country political risk ratings (government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tension, democratic accountability and bureaucratic quality) are mainly relevant in affecting the risk premium and government bond rates (the riskless rate).

The second main determinant of security prices is expected cash flows. Following CRR, real and nominal forces are both relevant in determining expected cash flows. Nominal forces include inflation, while real forces include changes in the expected level of real production. The economic component of country risk ratings, which includes GDP per head, real GDP growth, annual inflation rate, budget balance and current account as a percentage of GDP, is relevant in influencing expected cash flows through the inflation and real production channels.

The hypothesized relation between country risk ratings and country stock market index returns is also consistent with Ross's (1976) Arbitrage Pricing Theory (APT). The APT states that expected returns are based on the systematic exposure of a security to risk factors that cannot be diversified away. As opposed to the widely used CAPM, which assumes that all investors hold the market portfolio as the only risky asset, APT recognizes that investors take into account multiple sources of macroeconomic risk factors and their expected return depends on the respective sensitivities to these factors. To the extent that the components of country risk ratings are non-diversifiable, variation in country risk should be associated with changes in expected returns. Given that global financial markets are at least partially integrated, it is possible that country risk may not be diversified away.

To this end, country risk rating components (economic, financial and political) can be considered as potential candidates, systematically relating to country stock market index returns. However, given the number of variables within each risk rating component and their complex interrelations, this influence can be expected to be more prevalent in the long-run. That is, a long-run cointegrating relation between disaggregated country risk ratings and stock market index returns can be expected.

There exists a rich literature supporting the argument that macro variables have influence on stock prices and returns. The empirical literature also shows that there exist relationships among country risk ratings, national stock markets and expected returns. Since country risk ratings reflect countries' economic, financial and political fundamentals, this is a conceivable result.

Within this framework, this study aims at testing whether there is a long-run equilibrium relation between disaggregated country risk ratings and country stock market index returns for a large panel of countries. In other words, I hypothesize that since country risk ratings reflect financial, economic and political fundamentals of a country, from which stock prices are known to be affected, disaggregated country risk ratings can act as long-run state variables for predicting country stock market movements and there should be a long-run equilibrium relation between disaggregated country risk ratings and country stock market index returns. If such a relation is found to be present, the implications of such a relation can provide useful insights with regard to expected returns and cost of equity capital for an average-risk direct investment in a given country of known country risk ratings.

The hypothesized relation between country risk ratings and stock market returns will be investigated by analyzing a time series panel of countries with large time and cross section dimensions. The critical insight of the study is that the cross-section of the hypothesized long-run relation between country stock market returns and country risk ratings can help us determine the cost of equity capital for an average-risk direct capital investment project in the international context. This relation constitutes the basis for the proposed model that calculates the international cost of equity. International investors, with both short- and long-run investment horizons, would be interested in the proposed model.

1.2. Contributions of the Study

a. The study proposes an empirical model that calculates the international cost of equity for an average-risk investment in a given country of known political and economic risk ratings. The proposed model can be used to find the cost of equity for any country as long as the political and economic risk ratings are available. Since country risk ratings are reported for a large number of countries, the model has wide international applicability.

b. The study investigates both short- and long-run relations between country risk ratings and stock market movements in the international setting. The fundamental idea of the study that stock market index returns and country risk ratings should co-move implies an equilibrium in the long-run and adjustment dynamics in the short-run. Therefore, in addition to the long-run relations, the study also provides insights with respect to the short-run dynamics, in particular the speeds of adjustment, once the system is shocked.

c. It discerns the relative effects of political, financial and economic risk variables on international expected equity returns. The panel cointegration tests show that disaggregated risk ratings and country stock market index returns are cointegrated and disaggregated risk ratings are the forcing variables in the relation where country stock market index returns are the dependent variable. The long-run coefficients of the cointegration relation provides useful insights regarding the separate effects of political, financial and economic risk ratings on expected returns.

d. The study utilizes relatively rigorous and recent panel time series methods to deal with three important empirical issues: dynamic relations between country risk ratings and stock market movements, heterogeneity of this relation across countries, and cross-sectional error dependence due to unobserved common factors and spillover effects. Taking into account that the effect of risk ratings on stock market returns may occur over time rather than all at once, a dynamic panel time series model is utilized. In addition, as opposed to classical panel data methods, which assume slope parameter homogeneity, we take into account heterogeneity of slope parameters across countries. This is particularly important for the short-run dynamics, because while long-run coefficients can be expected to be homogenous due to budget or solvency constraints, arbitrage conditions or common technologies, short-run coefficients and speeds of adjustment can be heterogeneous across countries due to their dependence on country-specific variables (Pesaran, Shin and Smith, 1999). Finally, relatively new econometric techniques are used to test and eliminate cross-sectional error dependence, a phenomenon that has been shown in the recent literature to create seriously biased coefficients unless properly dealt with.

CHAPTER 2

REVIEW OF THE RELEVANT LITERATURE

In this chapter, the theoretical and empirical literature that is relevant in examining the relation between international cost of equity and country risk ratings is reviewed. In the first section, asset pricing models currently used as the fundamental theoretical base in calculating the cost of equity in a given country are discussed. In the second section, alternative ways that are used in practice in calculating the international cost of equity are reviewed. Most of these methods are based on different variations of the fundamental asset pricing models augmented with adjustments to reflect international risk factors. In the third section, the empirical literature about the relations between stock markets and components of country risk ratings is examined.

2.1. Asset Pricing Models

In this section, the two fundamental asset pricing theories, the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT) are reviewed. While both of these models were developed in a single country (the US) context with the assumption of market segmentation, they form the basis for all alternative methods used in calculating the international cost of equity.

2.1.1. The Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) is one of the most influential theories in the history of finance. Independently developed by Sharpe (1964), Lintner (1965) and Mossin (1966), it is often called the Sharpe-Lintner-Mossin model of asset pricing. The CAPM is an equilibrium relation, derived from the portfolio theory pioneered by Markowitz (1952). Under certain assumptions about the nature of assets and behaviour of investors, Sharpe, Lintner and Mossin investigated how prices and returns would be determined in equilibrium. Although the model has been critisized on the ground that it is based on many unrealistic assumptions, it sets the stage regarding the relevant measure of asset risk and expected returns of assets.

The derivation of CAPM is based on the Portfolio Theory. According to the Portfolio Theory, the relevant risk measure for an asset's return in a well diversified portfolio (in which nonsystematic risk is eliminated and only systematic risk remains) is its covariance with the portfolio return (contribution to the portfolio risk), namely its beta. Under certain assumptions, each investor, aiming to maximize the mean and minimize the variance of their portfolio return, face an efficient frontier, which is a set of portfolios with the highest return for a given variance. If the expectations of investors regarding the mean and variance of asset returns differ, then the efficient frontier would be different for each investor. However, under homogenous expectations, they would face the same efficient frontier. Sharpe, Lintner and Mossin recognized that if all investors face the same efficient frontier and thus hold the same efficient risky portfolio, then this must be the market portfolio in equilibrium. Then, investors will hold a combination of two portfolios; the market portfolio and the riskless asset. The proportion of these portfolios depends on the degree of risk aversion of the investor and the set of portfolios form a straight line, the capital market line.

Given that the beta is the correct measure of risk for an asset and that all investors hold the market portfolio as the only risky portfolio, arbitrage conditions ensure that assets having the same beta value should have the same expected return. This requirement forms a linear beta-return relation. To derive the equation of this line (the security market line), two points on it are used: the market portfolio with a beta of 1 and the riskless asset with a beta of zero. The equation is as follows:

$$R_i = R_F + \beta_i (R_M - R_F)$$

Where R_i is the expected return of asset i, R_F is the risk-free rate, β_i is the beta of the asset, R_M is the market return. (R_M-R_F) is called the market price of risk. Thus, the CAPM says that the expected return of an asset is the sum of two components: the risk-free rate and market price of risk multiplied by the security risk, namely its beta.

Since its development the CAPM has been the pimary model of expected returns in finance. Although its strong assumptions limit its empirical strength, it is still the most widely used model in the finance industry. Indeed, Graham and Harvey (2001) find in a survey of US CFOs that 73.5% of respondents use CAPM to calculate the cost of equity.

2.1.2. The Arbitrage Pricing Theory (APT)

As opposed to its theoretical perfection, the CAPM has little empirical strength. Since it requires many unrealistic assumptions, this is somewhat expected. The Arbitrage Pricing Theory, developed by Ross (1976) is an alternative way to calculate expected returns with much less assumptions. As opposed to the CAPM, which assumes the market portfolio as the only source of systematic risk and that all investors have identical expectations, APT does not require homogenous expectations and recognizes that investors take into account multiple sources of risk factors. The APT states that expected returns are determined by the systematic exposure (respective sensitivities) of a security to a set of common risk factors that cannot be diversified away.

The APT exploits the idea that any arbitrage opportunity is quickly eliminated in a well functioning financial market, making sure that securities or portfolios having the same payoff will have the same price. In other words, given the security market line consistent with the set of common factors, any asset falling out of this line presents an arbitrage opportunity, and its price will adjust as a result of arbitrage operations, shifting it back on the security market line.

This arbitrage process dictates a linear relationship between expected returns and the set of common factors in the following form:

$$E(r_i)=\lambda_0+ \lambda_1 b_{i,1} + \lambda_2 b_{i,2} + ... + \lambda_K b_{i,K}$$

This is the APT pricing equation, where $\lambda_0, \lambda_1, \lambda_2, ... \lambda_K$ are constants and $b_{i,1}$, $b_{i,2}, ...b_{i,K}$ are factor sensitivities that reflect how much extra return is needed for each extra unit of risk. λ_0 corresponds to an asset or portfolio of zero risk, therefore if there exists a risk-free asset, λ_0 should be equal to risk-free rate r_f. Therefore the equation becomes;

$$E(r_i)= r_f + \lambda_1 b_{i,1} + \lambda_2 b_{i,2} + ... + \lambda_K b_{i,K}$$

Then consider a well-diversified portfolio which has unit sensitivity to factor 1 and zero sensitivity to all other factors (b_1=1, all other b_i's are zero). Then the expected return of this portfolio (say δ_1) will be $r_f + \lambda_1$. Then $\lambda_1 = \delta_1 - r_f$. Repeating this with other portfolios that have unit sensitivity to factor i and zero sensitivity to all other factors the equation becomes;

$$E(r_i)= r_f + (\delta_1 - r_f)b_{i,1} + (\delta_2 - r_f)b_{i,2} + ... + (\delta_K - r_f)b_{i,K}$$

Thus the expected return of a security becomes the riskless rate plus K risk premiums that reflect the sensitivity of the security to each of the K factors. Note that the equation becomes identical to CAPM when the market portfolio is the only factor.

2.2. Ways to Calculate the International Cost of Equity[2]

There are diverse ways to calculate the international cost of equity in practice (Harvey, 2005). The following are twelve alternative ways, as documented by Harvey (2005), to calculate the international cost of equity.

2.2.1. The World CAPM

The World CAPM first developed by Solnik (1974) is based on the simple idea of transforming CAPM into the international setting. Assuming perfect capital market integration, the market portfolio is replaced by the world market portfolio, which was assumed to be the US market in the CAPM formulation. The beta of

[2] This section mainly draws on Harvey (2005).

CAPM that corresponds to the contribution of an asset to the well diversified market portfolio is replaced by the country beta which reflects the contribution of the country to the variance of the world market portfolio. Then the World CAPM is expressed as:

$$E[R_{i,t}]=\beta_{i,w}E[R_{w,t}]$$

where $E[R_{i,t}]$ is the expected excess return in country i, $\beta_{i,w}$ is the beta of the country as measured by the covariance of country return with the world market portfolio return, and $E[R_{w,t}]$ is the world market risk premium expressed as the return of the world market portfolio in excess of a risk free rate. In the world CAPM formulation, it is assumed that the purchasing power parity holds and investors hold the diversified world market portfolio. Returns are measured in a common currency (such as the US Dollar).

The empirical evidence on the World CAPM is mixed. While early studies find it difficult to reject a model relating average beta risk to average returns, more general models provide evidence against the world CAPM.

2.2.2. The World Multifactor CAPM

Following the Arbitrage Pricing Theory of Ross (1976), Ferson and Harvey (1993) extend the World CAPM to a multifactor formulation, which also allows for dynamic risk premiums and risk exposures. The model is,

$$E[R_{i,t}|Z_{t-1}]=\sum_{j=1}^{k}\beta_{i,j,t-1}E\left[F_{j,t}\mid \mathrm{Z}_{\mathrm{t-1}}\right]$$

where $E[R_{i,t}|Z_{t-1}]$ is the expected return for country i equity based on information Z available at $t-1$, F_j is a factor that the return in a country is sensitive to, k is the number of factors and $\beta_{i,j}$ is the sensitivity of the return in country i to a specific factor j. In this model, there are k factors and k different and dynamic betas.

This model has some merit in discriminating high and low expected return countries when applied to developed markets.

2.2.3. The Bekaert and Harvey Mixture Model

The Bekaert and Harvey Mixture Model is based on the notion of capital market integration and segmentation. If capital markets are fully integrated, then CAPM should be easily applied to international markets and expected returns should be determined by the covariance of an asset's return with the world market portfolio return. If, however, capital markets are fully segmented, then expected returns should be determined by the covariance of an asset's return with the local market return. Their model is formulated as follows:

$$E[R_{h,i,t}|Z_{t-1}] = r_{f,t} + \lambda_t \beta_{h,i,w,t-1} E[R_{w,t}|Z_{t-1}] + (1-\lambda) \beta_{h,i,i,t-1} E[R_{i,t}|Z_{t-1}]$$

where $E[R_{h,i,t}|Z_{t-1}]$ is the expected return in country h, $E[R_{w,t}|Z_{t-1}]$ is the time-varying world market risk premium, $E[R_{i,t}|Z_{t-1}]$ is the time-varying local market risk premium, $\beta_{h,i,w,t-1}$ is the dynamic beta of country h with respect to the world market portfolio and $\beta_{h,i,i,t-1}$ is the dynamic beta of country h with respect to local market portfolio. λ_t is a measure of capital market integration; if the market is fully integrated to world markets $\lambda_t=1$, if the market is perfectly segmented then $\lambda_t=0$.

2.2.4. The Sovereign Spread Model (Goldman Model)

When the CAPM is used to determine the cost of capital in emerging markets, the company return is regressed on the benchmark return (US portfolio or the world portfolio) and this yields beta values that are very close to zero or negative due to the low correlations of emerging markets with developed markets.This results in fitted values of expected returns in emerging markets that are close to the US risk-free rate.

To remedy this problem, some well-known investment banks and consulting firms use the Sovereign Spread Model. This model is based on the idea that a spread should be added to the expected return value that the World CAPM suggests. This addition increases the “unreasonably low” cost of capital to a more realistic level. The sovereign spread is calculated by taking the difference between the country’s US Dollar denominated bond yield and the US Tresury bond yield. The model is then,

$$E[R_{i,t}]=SS+\beta_{i,w}E[R_{w,t}]$$

where, SS is the sovereign spread. Thus, this model augments the World CAPM by the sovereign spread of the country in question.

The limitations of this model are as follows:

- The sovereign spread is the same for every company, which might have different country specific risk exposures
- The sovereign spread is not available in countries who do not issue dollar denominated bonds
- The additional factor does not have any economic interpretation
- The spread reflects risk premium to debt instruments, which is different than equity

2.2.5. The Implied Sovereign Spread Model

This model, developed by Erb, Harvey and Viskanta (1996a), offers a solution to one of the limitations of the Goldman Model that sovereign spread is not available in countries who do not issue dollar denominated bonds. A regression of observed sovereign spreads on country risk ratings yields a model that can be used to determine the implied sovereign spread for a country that does not issue dollar denominated bonds but has country risk rating. The model is;

$$SS_i=\alpha_1+ \alpha_1 RR_i+\varepsilon_i$$

After estimating the regression coefficients, one can plug-in the risk rating of a country to find the implied sovereign spread. This estimated spread then can be used in the Goldman Model.

2.2.6. The Sovereign Spread Volatility Ratio Model

In this model, the country in question is assumed to be segmented from world markets and the beta (covariance of the country market with S&P500 divided by the variance of the S&P500) used in the sovereign spread model is replaced by a modified beta, which is calculated as the ratio of the volatility of the country market to the volatility of S&P500. Then the model is;

$$E[R_{i,t}]=SS+(\sigma_i/\sigma_w)E[R_{w,t}]$$

where σ_i is the volatility of the country market, σ_w is the volatility of the S&P500. Since in a segmented market, the volatility of the market is greater than the covariance with the world market, the modified beta is greater than the unmodified beta, leading to a larger risk premium.

2.2.7. Damodaran Model

Since equity is riskier than debt, the sovereign spread model is subject to criticism as it uses bond spread for an equity cost of capital. Damodaran's model modifies the sovereign spread by multiplying it with a ratio of the country's equity market volatility to bond market volatility. The model is;

$$E[R_{i,t}] = (\sigma_{i,e}/\sigma_{i,d})SS+\beta_{i,w}E[R_{w,t}]$$

2.2.8. The Ibbotson Bayesian Model

In this model, the security's return in excess of the risk-free rate is regressed on the world market portfolio return in excess of the risk-free rate. Then the beta obtained is multiplied by the expected risk premium. One half of the intercept in the regression is added to this multiple. This addition plays a similar role as the sovereing spread and it increases the fitted cost of capital to more reasonable levels.

This model can be applied to countries without the need of a dolar denominated government bond issuance. However, addition of the one half of the intercept does not have any formal justification.

2.2.9. The Implied Cost of Capital Model

This model is based on the idea that given cash flow forecasts and observed market prices, an implied cost of capital value can be calculated by equating the present value of the cash flow forecasts to the observed market prices and solving for the discount rate. This model is developed by Lee, Ng and Swaminathan (2005). The main limitation of this model is that it depends on cash flow forecasts. If the forecasts are incorrect, then the model will yield incorrect estimates of the cost of capital.

2.2.10. The CSFB Model

This model is proposed by Hauptman and Natella (1997) for Latin American equities. In this model, the beta is measured against the local market index but the equity risk premium is the US equity risk premium, which is adjusted by multiplying it with the ratio of the local market coefficient of variation to the US market coefficient of variation. The adjusted term is further adjusted by another factor to account for the interdependence between the risk-free rate and the equity risk premium. The model is;

$$E[r_{i,t}] = r_{f,t} + \beta_{i,US}\{E[r_{US,t} - rf_{US,t}] \ x \ A_i\}K_i$$

where $r_{f,t}$ is the stripped yield of a Brady bond, $\beta_{i,US}$ is the beta of a stock against the local market index, $E[r_{US,t} - rf_{US,t}]$ is the US equity risk premium, A_i is the first adjustment factor (which is the ratio of the local market coefficient of variation to the US market coefficient of variation), K_i is the second adjustment factor that account for the interdependence between the risk-free rate and the equity risk premium.

2.2.11. Globally Same Expected Returns

This approach assumes that the cost of capital is the same across countries but the different risk exposures are reflected in cash flow forecasts. In this case, the risk is taken into account in the nominator rather than the denominator in the valuation equation. The limitation of this model lies in the difficulty of correctly reflecting risk in the cash flow forecasts. Monte Carlo simulations are generally used to achieve this but in that case a consistent model and correct risk distributions for the risk variables are needed.

2.2.12. The Erb-Harvey-Viskanta Model

This model is based on country risk ratings. Erb, Harvey and Viskanta (1996) use Institutional Investor's semiannual risk ratings as a proxy for fundamental risks and they fit a model by regressing country equity market returns on their country risk ratings. The model yields estimates of reward to credit risk and by using this measure they forecast expected returns in countries of known risk ratings. The model is;

$$R_{i,t}= a_0 +a_1Log(RR_{i,t-1})+\varepsilon_{i,t}$$

where, $R_{i,t}$ is the semiannual return in US dollars and RR is the Institutional Investor's semiannual country risk rating. By estimating a time-series cross sectional regression, they obtain the regression coefficients and a_1 as the reward for risk. Then, by plugging-in the risk rating of a country into the fitted equation they estimate rates of return in countries that do not have equity markets.

2.3. Relation Between Country Risk Components and Stock Returns

Many of the components of country risk ratings mentioned above have been found in the literature to associate with stock market movements. The leading works are those of Fama (1981, 1990), Chen, Roll and Ross (1986) and Schwert (1990), who find that corporate cash flows are related to macroeconomic variables in the US. Fama (1981) documents that there is a strong positive relation between real common stock returns and real activity. Chen, Roll and Ross (1986) find that the spread between long and short-term interest rates, expected and unexpected inflation, industrial production and the spread between high- and low-grade bonds are priced in the stock market. Schwert (1990) finds that there is a strong positive relation between real stock returns and future production growth rates.

Similarly, Hardouvelis (1987) finds that US stock prices respond to announcements of trade deficit, the unemployment rate and personal income. Flannery and Protopapadakis (2002) demonstrate that two inflation measures (the CPI and the PPI) affect only the level of the market portfolio's returns; three real factors (Balance of Trade, Employment/Unemployment and Housing Starts) affect only the returns' conditional volatility, while a Monetary Aggregate (generally M1) affects returns and conditional volatility. Graham, Nikkinen and Sahlström (2003) find that employment report, NAPM manufacturing, producer price index, import and export price indices and employment cost index announcements have significant influence on stock valuation in the US. Finally, Chen (2009) demonstrates that term spreads and inflation rates are the most useful predictors of stock market recessions in the US stock market.

The relationship between macro variables and stock markets is observed outside the US as well. For instance, Bilson, Brailsford and Hooper (2001) find that money supply, good prices, real activity and exchange rates are significant in their association with emerging market equity returns above that explained by the world factor.

There are also studies finding cointegrating relations between macro variables and country stock price indices. Humpe and Macmillan (2007) demonstrate that there is a single cointegrating vector between stock prices, industrial production, inflation and long term interest rate for the US. Kwon and Shin (1999) find that stock price indices in Korea are cointegrated with a set of macro variables (production index, exchange rate, trade balance and money supply). Mukherjee and Naka (1995) investigate the cointegration hypothesis for Japan and demonstrate that Japanese stock market is cointegrated with a group of six macro variables: exchange rate, inflation, money supply, real economic activity, long-term government bond rate and call money rate.

Cheung and Ng (1998) and Wongbangpo and Sharma (2002) investigate the cointegrating relationship in a multi-country context. Cheung and Ng (1998)'s tests indicate that real stock market indices of five countries (Canada, Germany, Italy, Japan and the US) cointegrate with measures of the countries' aggregate real activity, such as real oil price, real consumption, real money stock and real output. Wongbangpo and Sharma (2002) observe long and short-term relationships between stock prices and GNP, the CPI, the money supply, the interest rate and the exchange rate for Indonesia, Malaysia, Philippines, Singapore and Thailand.

The relation between stock returns and inflation is also extensively studied (Fama and Schwert, 1977; Fama, 1981; Geske and Roll, 1983; Solnik, 1983; Gultekin, 1983; Brandt and Wang, 2003; Hess and Lee, 1999; Lee, 1992; Boudoukh et. al., 1994). Fama and Schwert's (1977) study find a negative relation between expected inflation (and to a lesser extent unexpected inflation) and common stock returns, which contradicts with the previously accepted wisdom that common stock should be a hedge against inflation, as equities represent claims to real assets. This puzzling result was later explained by Fama (1981) with the proxy hypothesis. Fama (1981) argues that the negative relation between stock returns and inflation is induced by negative relations between inflation and real activity. In other words, according to Fama (1981), the positive relations between stock returns and real activity combine with the negative relations between inflation and real activity to induce spurious negative relations between stock returns and inflation.

Geske and Roll (1983) offer another explanation to the negative empirical relation between stock returns and expected and unexpected inflation. They argue that this could be an empirical illusion because a spurious causality is induced due to the following mechanism: A random real shock that affects stock returns signals changes in unemployment and corporate earnings, which in turn induce changes in tax revenues, in Treasury borrowing and thus Federal Reserve "monetization" of the increased debt. Realizing this mechanism, rational investors adjust prices accordingly.

Geske and Roll's (1983) model was further supported by Solnik (1983). Using data from nine major stock markets, he rejects the Fisher hypothesis that real returns are independent of expected inflation and stock price changes signal revisions in expected inflation. A similar result was found by Gultekin (1983) in twenty-six countries for the postwar period. In most of the sample countries, he was unable to find a positive relation between stock returns and inflation.

To explain the stock returns-inflation puzzle, Brandt and Wang (2003) propose the "time-varying risk aversion" approach, which argues that inflation increases investors' degree of risk aversion, thereby increasing the risk premiums and discount rates, thus resulting in undervaluation of stocks. Hess and Lee (1999) argue in their "two-regime" hypothesis that supply shocks induce a negative relation between stock returns and inflation, while demand shocks cause a positive relation, because supply shocks reflect real output disturbances while demand shocks are mainly due to monetary disturbances.

Lee (1992) uses VAR analysis to investigate the interactions among stock returns, interest rates, real activity and inflation, and demonstrates that little variation in inflation is explained by stock returns, while stock returns help explain a substantial fraction of the variance in real activity. Boudoukh et. al. (1994), on the other hand, show that there is a positive relationship between stock returns and inflation for non-cyclical industries, while the opposite holds for cyclic industries. They also find that the negative relationship between stock returns and inflation turns to positive in the long horizon.

Theoretical and empirical studies also show that political risk influences stock market movements, especially in emerging markets. First, Agmon and Findlay (1982) argue that domestic political risk may either reduce cash flows to the firm or increase investment risk and thus reduce asset value. Bailey and Chung (1995) find some evidence of equity market premiums for exposure to exchange rate and political risk in Mexico. Kim and Mei (2001) investigate the possible market impact of political risk in Hong Kong and find that political developments have a significant impact on the market volatility and returns. Similarly, Chan and Wei (1999) demonstrate that favorable (unfavorable) political news is correlated to positive (negative) returns for the Hong Kong Hang Seng index. Regarding the relative influence of political risk in developed and developing countries, Bilson, Brailsford and Hooper (2002)'s results indicate that political risk is more important in explaining return variation in emerging markets than in a comparative sample of developed markets.

The long-run relation between stock market movements and country risk ratings hypothesized in this study is consistent with the Efficient Market Hypothesis (EMH), which was developed by Fama (1970). The EMH asserts that stock prices reflect all available information. In the context of this study, the EMH implies that the forward-looking information inherent in country risk ratings should already be impounded in stock prices; therefore, stock prices should be the leading indicators of country risk ratings. However, this is not inconsistent with a long-run relation between stock prices and country risk ratings. The only issue is that which variable is the leading or forcing indicator and which variable is the lagging indicator. Whether they are leading or lagging, a long-run cointegrating relation between stock prices and country risk ratings is consistent with the EMH.

However, there is also considerable empirical evidence against the EMH that macroeconomic variables can influence stock returns (Jaffe and Mandelker, 1976; Fama and Schwert, 1977; Nelson, 1976; Maysami, Howe and Hamzah, 2004). This leads to the hypothesis that country risk ratings can also influence stock prices. This influence can be expected to be dominant in countries where institutional and informational problems that impede the efficiency of markets are more prevalent. Hondroyiannis and Papapetrou (2001), Kwon and Shin (1999) and Wongbangpo and Sharma (2002)'s results are consistent with this premise. Hondroyiannis and Papapetrou (2001) find for Greece; Kwon and Shin (1999) find for Korea; and Wongbangpo and Sharma (2002) find for five ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) that stock market indices are not a leading indicator for macroeconomic variables, while macroeconomic variables are able to predict stock price changes.

Harvey (2004)'s results are also supportive. Using International Country Risk Guide's political, financial and economic risk measures, he examines the importance of these risk components in portfolio and direct investment decisions. While his tests show little evidence that country risk measures are priced in developed countries, the composite, financial and economic risk ratings produce large average hedge portfolio returns in emerging markets. Specifically, the hedge portfolios formed on the financial and economic risk yield average annual returns of more than 13% in emerging markets. Portfolios formed on the composite rating yield an annual return of 9%. Thus, he concludes that country risk is priced in emerging markets but not in developed countries.

2.4. Risk Ratings and Stock Markets

Empirically, the effects of corporate credit ratings on individual stock prices are extensively studied; however, the literature is slant in investigating the effects of sovereign credit ratings on national stock markets. On the other hand, the predictive power of country credit ratings in explaining expected returns is mainly and extensively studied by Erb, Harvey and Viskanta (1995, 1996a, 1996b). Their first study in 1995 suggests that the country credit ratings can help discriminate between the high-expected return and the low-expected return countries. They find a 12 percentage point difference between the highest- and lowest-credit risk portfolios.

The relationship between expected returns and country credit ratings was formally tested by Erb, Harvey and Viscanta (1996a). They hypothesize that since country credit ratings are survey-based, they can be used as ex-ante measures of fundamental risks. They use Institutional Investor's semiannual country risk ratings and estimate a time-series cross sectional regression of MSCI return index on country risk by combining all the countries and ratings into one large model. They find an empirical relationship between country credit ratings and expected returns and use this relation to establish hurdle rates for projects of average risk in emerging country investments. However, their model includes only one risk measure, a composite country credit rating to explain expected returns.

A disaggregated investigation was later performed by Erb, Harvey and Viskanta (1996b), who examine the relationship between political, financial and economic risks on expected fixed-income returns. They employ a cross-sectional time-series approach and regress a vector of quarterly returns on each of the lagged risk attributes. They find that the International Country Risk Guide's (ICRG) financial risk component is negatively related with returns, indicating that increased financial risk (or reduced financial risk rating) is associated with higher returns. When the lagged logarithmic changes of the risk attributes are used in the regressions, they find positive and significant signs on financial and economic variables for un-hedged and foreign exchange portfolios. For the ICRG economic variable, they find positive and significant signs in un-hedged, local and foreign exchange portfolio returns. They also show that the country risk attributes are significantly related to real yields of fixed income securities.

There are relatively few studies that investigate the effects of sovereign credit ratings on national stock markets. Kaminsky and Schmukler (2001) examine the effects of sovereign ratings and outlook changes on the instability of emerging markets financial markets. They find that sovereign ratings and outlook changes have significant effects on both stock and bond markets. A domestic downgrade is associated with an average of two percentage point increase in bond yield spreads and a one percentage point decrease in stock returns. They additionally find that rating changes also have contagion and spillover effects. Brooks, Faff, Hillier and Hillier (2004) investigate the aggregate stock market impact of sovereign rating changes and find that while rating upgrades show little evidence of abnormal return behavior, rating downgrades have a significant and negative impact on domestic stock markets. Subaşı (2008), on the other hand, finds that sovereign rating downgrades have little negative effects on stock and exchange rate returns and volatility, probably because rating changes might be anticipated by the markets and therefore prices already discounted the information.

The effects of sovereign ratings on bond yields are studied by Cantor and Packer (1996), Reisen and Maltzan (1999) and Sy (2002), among others. Cantor and Packer (1996) find that actual changes in sovereign ratings independently affect the sovereign bond market spreads, and announcements of changes in the sovereign risk ratings are followed by bond yield movements, in particular for non-investment grade issues. Similarly, Reisen and Maltzan (1999) find a significant impact of sovereign ratings on bond yield spreads, both for imminent upgrades and actual downgrades. Sy (2002) investigates the relation between emerging market sovereign bond spreads and sovereign credit ratings, employing panel data estimation. Using Moody's and S&P's long-term foreign currency debt ratings for 17 emerging market countries, he finds a negative relation between sovereign bond spreads and sovereign credit ratings. A one-notch upgrade by rating agencies reduces sovereign bond spreads on average by 14%.

Sovereign debt rating changes are also found to have spillover effects on international debt and stock markets (Gande and Parsley, 2005; Ferreira and Gama, 2007; Li, Jeon, Cho, and Chiang, 2008). Gande and Parsley (2005) investigate whether a change in the sovereign credit ratings of a country has effects on the sovereign credit spreads of other countries. They find that rating changes in one country do affect sovereign credit spreads in other countries. The effect, however, is asymmetric: while negative ratings changes are associated with an increase in the spreads, positive ratings changes do not have a significant impact. Ferreira and Gama (2007) investigate the effects of sovereign debt ratings and outlook changes of one country on the stock market returns of other countries. Their results are consistent with those of Gande and Parsley (2005): on average, a one notch credit ratings downgrade is associated with 51 basis points decrease in the stock returns of other countries. Consistent with the findings of Gande and Parsley (2005), the effect is asymmetric in the sense that there is no significant impact of ratings upgrades. Li, Jeon, Cho, and Chiang (2008) investigate the contagion effects of sovereign credit ratings changes on cross-country stock markets as well as their effects on domestic stock markets. They find that sovereign credit ratings changes do have effects on both domestic and cross-country stock markets and the effect is magnified during the 1997 crisis period. All the three studies use Standard &Poor's sovereign credit ratings.

Hail and Leuz (2006) examine cross-country differences in the cost of equity capital on the basis of differences in countries' disclosure and securities regulation. Following Erb, Harvey and Viskanta (1996a), they use the annualized fitted values of the regression of semiannual stock returns on Institutional Investor's semiannual country credit-risk ratings as a proxy for future expected returns and compare these values with their implied cost of capital estimates. They find that these two measures are highly and significantly correlated, although they are calculated using different methods and variables.

Chen, Roll and Ross (1986) test whether innovations in macroeconomic variables are priced in the stock market. They propose a set of relevant variables and obtain the time-series of unanticipated movements. They find that industrial production, changes in risk premium, twists in the yield curve, measures of unanticipated inflation and changes in expected inflation systematically affect stock market returns. Relating to the present study, it is conceivable to think that these factors are more or less embedded in the political, financial and economic risk components, therefore it is plausible to expect significant relationships between stock market index movements and these risk attributes.

There are also studies investigating the association between political risk and foreign direct investment (FDI) (e.g. Clare and Gang, 2010; Jimenez, 2011). Clare and Gang (2010) find that exchange rate risk and political risk have negative effects on FDI from US multinationals to developing countries. On the other hand, Jimenez (2011)'s results indicate that higher political risk attract more FDI in the case of FDI from Spain, France and Italy to Central and Eastern European countries as well as North Africa, because of the firms that search niche markets "where they can take advantage of their political capabilities".

Sari, Uzunkaya and Hammoudeh (2013) examine the relationships between disaggregated country risk ratings and stock market movements in Turkey, using the autoregressive distributed lag approach, which was developed by Pesaran and Pesaran (2009) and Pesaran, Shin and Smith (2001). Using International Country Risk Guide's (ICRG) financial, economic and political risk ratings, they find that there is a long-run relationship between Turkey's disaggregated country risk ratings and its stock market index movements. In the long-run, Turkey's economic, financial and political risk rating components are the forcing variables of stock market movements. However, in the short-run, only the political and financial risk rating components have positive and significant impact on the market movements.

Hammoudeh, Sari, Uzunkaya and Liu, (2013) extend Sari, Uzunkaya and Hammoudeh (2013)'s work to BRICS (Brazil, Russia, India, China and South Africa) countries. They examine the relationships among the economic, financial and political risk ratings of the BRICS countries and relate those risk ratings to their respective national stock markets in the presence of representatives of the world's major stock markets and oil market. In other words, adding two more variables (namely the US stock market index and oil price) to Sari, Uzunkaya and Hammoudeh (2013)'s work, they investigate the dynamic relations between BRICS's disaggregated country risk ratings, respective country stock markets, US stock market and oil price. They also examine the interrelationships among the national country financial risk ratings factors to discern transmission of the risk spectrum among the BRICS. They find that only the Chinese stock market is sensitive to all the factors. Financial risk ratings generally demonstrate more sensitivity than economic and political risk ratings, and political risk is sensitive to both financial and economic risk ratings. Among the five BRICS, Brazil shows special sensitivity to economic and financial risks, while Russia and China hold strong sensitivity to political risk and India demonstrates special sensitivity to higher oil prices.

In the context of the consumption based CAPM, Bansal and Kiku (2011) show that when cash flows and consumption are cointegrated, temporary deviations between their levels forecast long-horizon dividend growth rates and returns. This is possible by modeling dividend growth rates, price-dividend ratios and returns by means of the error-correction specification of the cointegrating relation.

CHAPTER 3

RESEARCH DESIGN

3.1. The Hypotheses

The foregoing discussion in Chapter-2 shows that there exists a relationship between macroeconomic variables and stock returns. Either leading or lagging, stock returns and macro variables are related. There is also evidence that political risk influences stock prices. Therefore, it is conceivable to think that country risk ratings, which are made up of macroeconomic, financial and political risk variables, should also be related to stock markets.

However, given the number of variables within each risk rating component and their complex interrelations with stock market returns, it is plausible to expect that the co-movement of country risk ratings and stock market returns would be more apparent in a long-run perspective. In other words, these variables should move together in the long-run and there should be a long-run equilibrium relation between them. This is analogous to argue that stock market returns and disaggregated country risk ratings should be cointegrated.

Thus, the study is primarily interested in testing this cointegration hypothesis, which will be done in a panel time series setting[3]. If the null of no cointegration is rejected, statistically significant coefficients (if any) of the long-run cointegrating relation between the involved variables will provide cross-sectional expected return relations with respect to risk ratings. In other words, statistically significant coefficients of the long-run cointegrating relation will represent the “international reward for risk” for the respective rating component. Any statistically significant coefficient will also imply that the respective risk factor cannot be diversified away internationally and thus they are priced, consistent with the well-known asset pricing theories.

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[3] The justification of using panel time series methods is given in section 3.3.

The results of the empirical tests will also have interesting implications with respect to the Efficient Market Hypothesis (EMH). The strong form of the EMH asserts that stock prices already include all publicly available information and it is not possible to beat the market by exploiting past, present and future data. If the EMH holds, political, financial and economic risk components of country risk ratings, which are publicly available, should not have statistically significant bearings on expected returns. In this respect, a by-product of the study is an indirect test of the EMH.

An advantage and a useful characteristic of cointegrated relations is that the variables in the relation respond to any deviation from long-run equilibrium. This feature implies an error-correction mechanism, from which short-run dynamics can be assessed. If the hypothesized cointegration relation between disaggregated risk ratings and stock market returns is supported by the data, the short-run dynamics, especially the speed of adjustment to equilibrium, will be of particular interest.

Consistent with the asset pricing traditions, there should be a positive relation between stock market expected returns and country risk. In other words, higher country risk should be associated with higher expected returns if country risk is a proxy for systematic risk factors. Since higher (lower) ratings correspond to lower (higher) risk, negative signs are expected on the long-run coefficients of the political, financial and economic risk ratings in all specifications that are discussed in detail in Section 3.3.

3.2. Data and Variables

As measures of disaggregated country risk ratings, Political Risk Services' International Country Risk Guide (ICRG) economic, financial and political risk ratings are used. ICRG provides these ratings on a monthly basis with numerical scales, higher numbers indicating lower risk and lower numbers higher risk. The Political Risk component is based on 100 points, while both Financial and Economic Risk components are based on 50 points. Dividing the total of Political, Financial and Economic risk components by two yields the Composite Risk Rating. The data is available on a monthly basis between January 1984 and October 2013. The starting date of the data differs from country to country, earliest starting from Jan 1984. Thus the time dimension (T) of the panel becomes as large as 358 for some countries.

The ICRG system is well explained by its Vendor, the PRS Groups as follows (http://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf)

> *"The system is based on a set of 22 components grouped into three major categories of risk: political, financial, and economic, with political risk comprising 12 components (and 15 subcomponents), and financial and economic risk each comprising five components. Each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk. The maximum points able to be awarded to any particular risk component is pre-set within the system and depends on the importance (weighting) of that component to the overall risk of a country.*
>
> *The ICRG staff collects political information and financial and economic data, converting these into risk points for each individual risk component on the basis of a consistent pattern of evaluation. The political risk assessments are made on the basis of subjective analysis of the available information, while the financial and economic risk assessments are made solely on the basis of objective data. In addition to the 22 individual ratings, the ICRG model also produces a rating for each of the three risk factor groups plus an overall score for each country."*

The ICRG ratings differ from the ratings of other global credit rating agencies in several aspects. First, among other ratings agencies such as Moody's, Euromoney, S&P's, Institutional Investor and Economic Intelligence Unit (EIU), ICRG is the only one providing ratings on a monthly basis (Hoti, unpublished working paper), which increases the frequency of time-series data. Second, in addition to a composite index, the ICRG provides political, financial and economic risk ratings separately, which can facilitate the practical assessments done by international investors regarding the respective fundamentals of a country that is of interest. Furthermore, if some specific risk factors have greater bearing on investments, customized composite ratings can be calculated by changing the weights of the disaggregated factors.

The ICRG Economic Risk Rating *(E)* includes the following sub-components with their respective weights in parenthesis: GDP per head (10%), real GDP growth (20%), annual inflation rate (20%), budget balance as a percentage of GDP (20%) and current account as a percent of GDP (30%). The Financial Risk Rating (*F*) sub-components are, foreign debt as a percent of GDP (20%), foreign debt service as a percentage of exports of goods and services (20%), current account as a percent of exports of goods and services(30%), net international liquidity as months of import cover (10%) and exchange rate stability (20%). Finally, the Political Risk Rating (*P*) sub-components are as follows: Government stability (12%), socioeconomic conditions (12%), investment profile (12%), internal conflict (12%), external conflict (12%), corruption (6%), military in politics (6%), religion in politics (6%), law and order (6%), ethnic tension (6%), democratic accountability(6%), and bureaucratic quality (6%). For the same period and frequency, I will use Morgan Stanley Capital International's (MSCI) total dollar-denominated equity return index for the sample countries.

An important consideration about the ICRG data is that it might have measurement errors in measuring country risk. In other words, the reliability of the ICRG country risk data in predicting risk realizations is in question and should be assessed. Howell and Chaddick (1994) and Bekaert, et. al. (2014) are good examples in this respect. The former compares the predicting ability of political risk ratings provided by three different methods: that of *The Economist, of the* Political Risk Services (PRS) and of the Business Environment Risk Infirmation (BERI). They compare the projections of the three methods with realized lossess and assess their prediction ability. Their results suggest that the PRS political risk predictions are the most reliable among the three methods assessed. Similarly, Bekaert, et. al. (2014) find that "*ICRG political risk ratings represent meaningful differences in the probability of future political risk realizations*" (p.477).

Another consideration about disaggregated risk ratings would be their correlations among each other and the extent of multicollinearity. Correlations between the changes of the variables given in Appendix-G show that multicollinearity is not a significant concern.

To measure country stock market index returns, Morgan Stanley Capital International's (MSCI) Country Stock Market USD Price Index data is used. Data was obtained from Datastream. The first difference of the natural logarithm of MSCI price indices gives the continuously compounded return on the respective stock market index.

Although country risk data is available for 146 countries (N), the country stock market index data and time intersections of the two groups restrict the overall sample. Stock market index data is available for a total of 75 countries. The intersection of the cross-sectional and time dimension of the available data results in a cross-sectional dimension of 75 and an unbalanced time dimension; earliest starting from Jan 1984, latest from Jan 2008.

Next, the total 75 countries were divided into three categories, developed, emerging and frontier[4], using the categorization offered by MSCI. Out of the total 75, 24 are developed, 21 are emerging, and 30 are frontier countries (The list of countries in each sample is given in Appendix-E). The aim of this categorization is to see and assess the hypothesized relations in different country groups according to their level of development.

Finally, the size of the full sample reduces to 51 to make the sample compatible with the cross-sectional error dependence test; a crucial step for the empirical analysis and is not able perform if the panel becomes highly unbalanced, which is the case when N=75 (details of this test will be discussed in the next section). With N=51 and T=<358, the panel becomes quite large and the proposed empirical model is based on this full sample.

[4] A term first coined by an IMF Economist, Farida Khambata in 1992, a "frontier market" is a type of market, which is more developed than the least developed countries, but too small to be generally considered an emerging market (http://en.wikipedia.org/wiki/Frontier_markets, visit date, May, 15th 2015)

3.3. Methodology

3.3.1. Estimation of Long-run Relations in Economics[5]

Assume that there exists a single long-run relation between a dependent variable and a regressor. Assume also that the dependent variable y_t and the regressor x_t are jointly determined by the following vector autoregression of order 1, VAR(1):

$$z_t = \Phi z_{t-1} + e_t \tag{1}$$

where $\Phi = (\phi_{ij})$ is a 2x2 matrix of unknown parameters and $e_t=(e_y, e_x)'$ is a 2-dimensioinal vector of reduced errors. If the covariance of e_{yt} and e_{xt} is $\omega\, Var(e_{xt})$,

$$e_{yt} = E(e_{yt} | e_{xt}) + u_t = \omega e_{xt} + u_t \tag{2}$$

here, u_t is uncorrelated with e_{xt} by construction. If (2) is substituted in the equation for y_t in (1),

$$y_t = \phi_{11} y_{t-1} + \phi_{12} x_{t-1} + \omega e_{xt} + u_t \tag{3}$$

The expression for e_{xt} can be obtained by using the equation for x_t in (1) as follows:

$$e_{xt} = x_t - \phi_{21} y_{t-1} - \phi_{21} x_{t-1}$$

if this expression is subsituted in (3), the following conditional model for y_t is obtained:

$$y_t = \varphi y_{t-1} + \beta_0 x_t + \beta_1 x_{t-1} + u_t \tag{4}$$

[5] This sub-section is adapted from Section-2 of Chudik, Pesaran, Mohaddes and Raissi (2015).

where,

$$\varphi = \phi_{11} - \omega\phi_{21},\ \beta_0 = \omega\ ,\ \beta_1 = \phi_{12} - \omega\phi_{22} \tag{5}$$

As can be seen, (4) is an ARDL(1,1) specification of y_t on x_t and the short-run coefficients φ, β_0 and β_1 can be directly estimated by least squares, as u_t is uncorrelated with the regressor by construction.

The ARDL model (4) can also be reparametrized and written in the following error-correction representation, as it is convenient to work with this form:

$$\Delta y_t = -(1-\varphi)(y_{t-1} - \theta x_{t-1}) + \beta_0 \Delta x_t + u_t$$

or as a level relationship as follows[6]:

$$y_t = \theta x_t + \alpha(L)\Delta x_t + \tilde{u}_t \tag{6}$$

where $\tilde{u}_t = (1-\varphi L)^{-1} u_t$, $\alpha(L) = \sum_{l=0}^{\infty} \alpha_l L^l$, $\alpha_l = \sum_{s=l+1}^{\infty} \delta_s$ for l=0,1,2,… and

$$\delta(L) = \sum_{l=0}^{\infty} \delta_l L^l = (1-\varphi L)^{-1}(\beta_0 + \beta_1 L)$$

Then the long-run coefficent becomes:

$$\theta = \frac{\beta_0 + \beta_1}{1-\varphi}$$

The general form of Eq(4) in a panel data setting is an ARDL(p_y,p_x,p_x,...) model:

[6] For the proof, please see Chudik, Pesaran, Mohaddes and Raissi (2015).

$$y_{it} = \sum_{l=1}^{p_{yi}} \varphi_{il} y_{i,t-l} + \sum_{l=0}^{p_{xi}} \beta'_{il} x_{i,t-l} + u_{it} \tag{7}$$

i= 1,2,....N

t=1,2,.....T

$$u_{it} = \gamma_t' f_t + \varepsilon_{it}$$

where ***f*** is an *mx1* vector of unobserved common factors; p_{yi} and p_{xi} are lag orders of the dependent and independent variables, respectively. The lag orders are selected sufficiently long to make u_{it} a serially uncorrelated process across all *i*. Then the long-run coefficient vector becomes:

$$\theta_i = \frac{\sum_{l=0}^{p_x} \beta_{il}}{1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}} \tag{8}$$

There are mainly two approaches in the literature to estimate θ (Chudik, Pesaran, Mohaddes and Raissi, 2013). The first is to estimate the short-run coefficients (β and φ) as an initial step and then to substitute these estimates in Eq(8) to calculate the long-run coefficient(s). This method uses the ARDL approach to estimate long-run relations.

The second approach, developed by Chudik, Pesaran, Mohaddes and Raissi (2013) and Chudik, Pesaran, Mohaddes and Raissi (2015), estimates the long-run coefficients directly without estimating short-run coefficients first. This is done by reparametrizing the ARDL model (7) as follows[7]:

$$y_{it} = \theta_i' x_{it} + \alpha_i'(L)\Delta x_{i,t-l} + u_{it} \tag{10}$$

[7] For the proof, please see Chudik, Pesaran, Mohaddes and Raissi (2015).

where, $u_{it} = \varphi(L)^{-1}$, $u_{it} = \varphi(L) = 1 - \sum_{l=1}^{p_{yi}} \varphi_{il} L^l$, $\theta_i = \delta_i(1)$,

$\delta_i(L) = \varphi^{-1}(L)\beta_i(L) = \sum_{l=0}^{\infty} \delta_{il} L^l$, $\beta_i(L) = \sum_{l=0}^{p_{xi}} \beta_{il} L^l$, and $\alpha_i(L) = \sum_{l=0}^{\infty} \sum_{s=l+1}^{\infty} \delta_s L^l$

Note that Eq(10) does not include a lagged dependent variable, so it is a distributed lag (DL) representation. Chudik, Pesaran, Mohaddes and Raissi (2015) demonstrate that least squares can be used to obtain consistent estimates of the long-run coefficient θ directly by regressing y_{it} on x_{it} and $\{\Delta x_{it-l}\}_{l=0}^{p}$ in the absence of feedback effects from lagged values of y_{it} onto x_{it}. The truncation lag order p is chosen as an increasing function of the sample size (specifically, p is selected as the integer part of $T^{1/3}$, where T is the length of the time dimension). If there exist feedback effects from lagged values of y_{it} onto x_{it}, however, this approach becomes inconsistent, as in this case u_{it} will be correlated with x_{it}. On the other hand, strict exogeneity is not required for consistency in this approach. For more details please refer to Chudik, Pesaran, Mohaddes and Raissi (2015).

3.3.2. The Models

In this framework, the hypothesized long-run relation is examined basically by the Autoregressive Distributed Lag (ARDL) method of Pesaran and Shin (1998) and the Distributed Lag (DL) method of Chudik, Pesaran, Mohaddes and Raissi (2015) on a panel data setting. To estimate the ARDL specification, Mean Group (MG) Estimator of Pesaran and Smith (1995) and Pooled Mean Group (PMG) estimator of Pesaran, Shin and Smith (1999) are used that accommodate cross-country slope heterogeneity. The Dynamic Fixed Effect (DFE) estimator is also used for comparison purposes. To deal with cross-sectional error dependence, the Cross-Sectionally Augmented ARDL (CS-ARDL) approach of Chudik and Pesaran (2015) and Cross-Sectionally Augmented Distributed Lag (CS-DL) approach developed by Chudik, Pesaran, Mohaddes and Raissi (2013) and Chudik, Pesaran, Mohaddes and Raissi (2015) are used. The CS-DL method also deals with some of the shortcomings of the ARDL specification, while it has also its own drawbacks. The relative merits of these ARDL and DL methods are discussed below.

The basic ARDL specification is as follows:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it} \tag{11}$$

where,

$$\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il} \tag{12}$$

and

$$\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il} \tag{13}$$

and y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, x_{it} =(lnP_{it}, lnF_{it}, lnE_{it})', lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the recent global financial crisis as December 2007, *Trend* is a linear time trend and p_x and p_y are respective lag orders. Note that the left hand side of the equation is a return expression as the first difference of the natural log of the MSCI country stock market index gives the continuously compounded monthly return for the relevant stock market index. The maximum lag order is taken as six, which is supposed to be long enough for a stock market to react changes in country risk ratings.

Even though the alternative commonly used cointegration approach developed by Johansen (1988, 1991) and Johansen and Juselius (1990) is more efficient in multivariate systems, the ARDL approach has three basic advantages over these two approaches: First, ARDL is valid irrespective of whether the series are *I(0)* or *I(1)* and whether the regressors are exogenous or endogenous (Chudik, Pesaran, Mohaddes and Raissi, 2013). The former characteristic is attractive because the data used in this study represent a mix of *I(0)* and *I(1)* series[8]. This feature of ARDL also avoids the pre-testing problems involved in standard cointegration methods. The previously adopted methods in Johansen (1988, 1991) and Johansen and Juselius (1990) and Engle and Granger (1987) are valid in cases where the underlying variables are integrated of the same order (Pesaran, Shin and Smith, 2001). The latter advantage is also appealing, because reverse causality can be important in the relation where disaggregated country risk ratings are the independent variables and stock market return is the dependent variable. As the literature surveyed in Chapter-2 shows, while political, financial and economic risk ratings could have an impact on stock market returns, the opposite can also hold, namely, stock market returns can influence risk ratings. Since this study is primarily interested in the impact of risk ratings on stock market returns, accounting for possible feedback effects is valuable.

Second, more efficient cointegration relationships can be determined with small samples using the ARDL approach (Ghatak and Siddiki, 2001; Narayan, 2005). Third, ARDL overcomes the problems resulting from non-stationary time series data (Laurenceson and Chai, 2003). Stock and Watson (2003) report that if a regressor has a unit root, then the OLS estimator of its coefficient and the corresponding t-statistic from OLS estimation can have non-normal distributions. This problem may lead to spurious regression and autoregressive coefficients that are biased towards zero.

The ARDL approach allows for autoregressive dynamic relations as well. This is important in two aspects: first, the effect of risk ratings on stock market returns may occur over time rather than all at once. Second, stock markets can be influenced from their past performance due to the well-known momentum effect of Jegadeesh and Titman (1993).

The ARDL approach has also its limitations. Due to the inclusion of lagged dependent variables in the regressions, if the time dimension is not sufficiently long

[8] The unit root tests of the series are not reported, but available from the author upon request.

and the speed of convergence towards long-run equilibrium is slow, the ARDL can be subject to large sampling uncertainty (Chudik, Mohaddes, Pesaran and Raissi, 2015). This can be seen by examining Eq(8); if $\sum_{l=1}^{p_y} \hat{\varphi}_{il}$ gets close to unity, meaning that the lagged dependent variable is persistent and thus the speed of adjustment is slow, the denominator in Eq(8) goes to zero and θ becomes very large. Because of these reasons, lag order selection is critical in ARDL applications as underestimating the correct lag order may result in inconsistent estimates while overestimating may lead to inefficiency and low power (Chudik, Pesaran, Mohaddes and Raissi, 2015). In relation to our case, neither of these limitations seem to be crucial because, first, the time dimension is quite large (T_{max}=358) and second, the empirical results show that the speed of adjustment of the system is rather high.

Another drawback of the classical ARDL approach, which is applicable to and important for our case is that it assumes cross-sectional independence of errors. This assumption is problematic because numerous unobserved global factors may simultaneously affect all cross-sectional units and can lead to biased estimates if these unobserved common factors are correlated with the regressors (Chudik, Pesaran, Mohaddes and Raissi, 2013). Indeed the Cross-Sectional Dependence Test of Pesaran (2004, 2013) shows in our case that there is considerable dependence of errors across countries. This needs to be carefully taken into account.

To deal with cross-sectional error dependence, two methods will be used. The first is the Cross-Sectionally Augmented ARDL (CS-ARDL) approach of Chudik and Pesaran (2015) and the second is the Cross-Sectionally Augmented Distributed Lag (CS-DL) approach of Chudik, Pesaran, Mohaddes and Raissi (2013) and Chudik, Pesaran, Mohaddes and Raissi (2015).

The Cross-Sectionally Augmented ARDL (CS-ARDL) approach of Chudik and Pesaran (2015) augments the ARDL regression given in Eq(7) with cross-sectional averages of the dependent variable, regressors and a sufficient number of their lags as follows:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it} \quad (14)$$

where

$$\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il} \tag{15}$$

and

$$\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il} \tag{16}$$

and y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, x_{it} =(lnP_{it}, lnF_{it}, lnE_{it})', $\bar{z}_t$ =($\bar{y}_t, \bar{x}'_t$)', $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the recent global financial crisis as December 2007, *Trend* is a linear time trend term and p_x=p_y=1,2; p_z=3. [9]

The CS-ARDL approach has the advantages of the classical ARDL approach and additionally it allows for cross-sectional dependence of errors. However, it is applicable only to stationary panels[10] and still subject to the small *T* bias of the classical ARDL approach (Chudik, Pesaran, Mohaddes and Raissi, 2015).

Finally, Cross-Sectionally Augmented Distributed Lag (CS-DL) approach of Chudik, Pesaran, Mohaddes and Raissi (2013) and Chudik, Pesaran, Mohaddes and Raissi (2015) augments the DL regression given in Eq(10) with cross-sectional averages of the dependent variable, regressors a sufficient number of their lags as follows:

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[9] For greater lag values the computer software was unable to solve the system.

[10] Various panel unit roots were conducted to see whether the panels are stationary or not. Im, Pesaran, Shin, Fisher Type Dickey-Fuller and Fisher Type Phillips-Pherron panel unit root tests all reject the null that "all panels contain unit roots", concluding that "some panels are stationary".

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it} \tag{17}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, x_{it} =(lnP_{it}, lnF_{it}, lnE_{it})', $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), Dummy is a dummy variable as defined before and *Trend* is a linear time trend term, and p=1,2,3,…7; p_y=0, p_x=7.[11] The time trend is included in all specifications to account for any possible trending behavior that could result in spurious regressions.

The main advantage of the CS-DL method over the panel ARDL approach is that it is robust to important specification issues and its small sample performance is better as compared to the ARDL approach when T is not large (Chudik, Pesaran, Mohaddes and Raissi, 2015). Its advantages stem from:

(a) its robustness to the possible inclusion of nonstationary regressors and/or factors,
(b) its applicability to both heterogeneous and homogenous coefficient cases across panel units,
(c) its robustness to an arbitrary degree of serial correlation in the error terms ε_{it} and f_t,
(d) the fact that, under certain conditions, there is no need to know the number of unobserved common factors,
(e) its allowance for weak cross-sectional dependence in the idiosyncratic errors ε_{it},
(f) its independence from the lag order selection p_{yi} and p_{xi}; only a truncation lag order selection is selected,

[11] The truncation lag order p is selected as the integer part of $T^{1/3}$, where T is the time dimension of the series.

(g) its robustness to possible breaks in the idiosyncratic errors ε_{it}.

The CS-DL approach has also an important disadvantage: In the presence of feedback effects (reverse causality) from lagged values of the dependent variable onto the regressors, the CS-DL estimation of the long-run coefficients will be inconsistent; since when there is feedback effects, u_{it} will be correlated with the regressors, which creates a bias even when N and T are sufficiently large.

Comparing the relative advantages and disadvantages of the CS-ARDL and CS-DL approach, it should be emphasized that they are not substitutes; they are rather complementary methods, because they have their own merits and drawbacks, which cannot be fully compensated by the other.

3.3.3. Estimation Methods

When N is large and T is long enough to run separate time series regressions for each group, four procedures are traditionally used to estimate the average effect of some exogenous variable on a dependent variable (Pesaran and Smith, 1995):

1. Estimating separate regressions for each group and averaging the coefficients over groups (the mean group estimator-MG).
2. Combining the data by imposing common slopes, allowing for fixed or random intercepts, and estimating pooled regressions (classical fixed and random-effect estimators).
3. Averaging the data over groups and estimating average time-series regressions.
4. Averaging the data over time and estimating cross-section regressions on group means.

In the static case, where the regressors are strictly exogenous and the coefficients differ randomly and are distributed independently of the regressors across groups, all four procedures provide consistent (and unbiased) estimates of the coefficient means (Pesaran and Smith, 1995, *p80*). For dynamic heterogeneous models, however, Pesaran and Smith (1995) show that this is not the case.

They demonstrate that the pooled and aggregate estimators (the second and third options given above) are not consistent in dynamic heterogeneous models, even for large *N* and *T*, and the biases can be "very substantial". They argue that unless the slope coefficients are in fact identical, traditional pooled estimation methods can produce misleading parameter estimates in dynamic panels. Because, incorrectly ignoring coefficient heterogeneity induces serial correlation in the disturbance when the regressors are serially correlated, and this generates inconsistent estimates (even as $T \to \infty$) in dynamic models. To demonstrate, consider the following simple heterogeneous dynamic model (Pesaran and Smith, 1995):

$$y_{it} = \lambda_i y_{i,t-1} + \beta_i x_{it} + \varepsilon_{it} \quad i = 1,2,\dots\dots,N \quad t = 1,2,\dots\dots\dots,T$$

with its coefficients λ_i and β_i vary across groups according to the following random coefficient model:

$$\lambda_i = \lambda + \eta_{1i}, \qquad \beta_i = \beta + \eta_{2i}$$

where η_{1i} and η_{2i} are assumed to have zero means and constant covariances.

Given that in most panels of this sort, tests indicate that parameters of interest differ significantly across groups and if this dynamic heterogeneous relation is modelled by a homogenous pooled regression (with different group-specific or random effects) as below;

$$y_{it} = \alpha_i + \lambda y_{i,t-1} + \beta' x_{it} + \nu_{it}$$
$$i = 1,2,\dots\dots,N$$
$$t = 1,2,\dots\dots\dots,T$$

$$\nu_{it} = \varepsilon_{it} + \eta_{1i} y_{i,t-1} + \eta'_{2i} x_{it}$$

Then, under certain assumptions, since $y_{i,t-1}$ and x_{it} are correlated with ν_{it}, pooled estimators will be inconsistent.

Pesaran and Smith (1995) demonstrate that because of the complexity of the process generating ν_{it}, standard corrections for serial correlation are unlikely to work. Use of instrumental variables (IV) would not be successful either, because given the structure of the composite disturbances ν_{it}, all variables that are correlated with $y_{i,t-1}$or x_{it}will also be correlated with ν_{it}. Only those variables that are uncorrelated with lagged values of ε_{it} and x_{it} have a zero correlation with ν_{it}. But such variables, assuming they exist, will also be uncorrelated with the regressors rendering their use as instrumental variables invalid.

A similar approach can be advanced for the aggregate time-series estimator case (i.e., averaging the data over groups and estimating average time-series regressions). For details see Pesaran and Smith, (1995).

According to Pesaran and Smith (1995), averaging the data over time and estimating cross-section regressions on group means (the fourth alternative in the list above), produce consistent estimates of the average long-run coefficients. However, they also warn that running cross-section regressions based on a single or a few years of observations is not likely to yield unbiased or consistent estimates.

For estimation of dynamic random coefficient models, Pesaran and Smith (1995) proposed the Mean Group Estimator (MG), which can obtain consistent estimates of coefficients in large dynamic heterogeneous panels. The MG Estimator is based on estimating separate regressions for each group and averaging the coefficients over groups. Pesaran, Smith and Im (1996) use Monte Carlo experiments to investigate the small sample properties of various dynamic heterogeneous panel data model estimators and find that even for quite small panels (N=T=20) the MG Estimator performs well in estimating the long run effects. Their Monte Carlo experiments also clearly show that the traditional pooled estimators can be quite misleading for dynamic heterogeneous panels and can regularly lead to incorrect inferences.

As an alternative to the traditional pooled fixed and random effect approaches in dynamic heterogeneous panels, Pesaran, Shin and Smith (1999) propose an intermediate model, in which intercepts, short-run coefficients and error variances are allowed to differ freely across groups, while long-run coefficients are restricted to be the same across groups. They call this the Pooled Mean Group Estimator (PMG). They argue that budget or solvency constraints, arbitrage conditions, or common technologies influencing all groups in a similar way make it quite reasonable to expect the long-run equilibrium relationships between variables to be similar across groups, but it is not the case for short-run dynamics and error variances, which could be different due to group specific factors.

In the classical panel ARDL case, in addition to the PMG and MG estimators, dynamic fixed effect (DFE) estimator is also used for comparison purposes. As mentioned earlier, the DFE estimator is inconsistent unless slope parameters are homogenous across cross sections. The PMG estimator is consistent and efficient under parameter homogeneity, but inconsistent if the true model is heterogeneous. The MG estimator is consistent in either case as long as the errors are cross-sectionally independent.

In the CS-ARDL case, PMG and MG estimators, in the CS-DL case only MG estimator is used.

CHAPTER 4

EMPIRICAL APPLICATION AND RESULTS

4.1. Introduction

Considering that the hypothesized relations may vary depending on the degree of market integration, the methodology described above is applied to 4 different samples; developed countries, emerging countries, frontier countries and the full sample.

The empirical application starts with panel unit root tests, since the CS-ARDL approach is applicable only to stationary panels. In addition the estimation methods discussed in the previous section (PMG, MD and DFE) assume that a long-run relation exists between the included variables. Therefore, panel cointegration tests were conducted for each sample. Panel cointegration tests serve also to one of the main purposes of this study: to test whether there is a long-run relation between disaggregated country risk ratings and stock market index returns.

4.2. Panel Unit Root Tests

Three different unit root tests are applied to the series for each sample: i) Im, Pesaran, Shin panel unit root test, ii) Fisher Type Dickey-Fuller panel unit root test and iii) Fisher Type Phillips-Pherron panel unit root test. The null hypothesis of the Im, Pesaran, Shin panel unit root test is that “all panels contain unit roots” against the alternative “some panels are stationary”. The remaining two tests are based on the same null hypothesis against “at least one panel is stationary”. Levin-Lin-Chiu, Harris-Tzavalis and Breitung tests could not be applied because all of them require strongly balanced data.

Panel unit root tests applied to developed, emerging countries and full sample all strongly reject the null hypothesis that all panels contain unit roots. In the frontier countries sample there is evidence of unit root in the political risk rating and some tests (not all) fail to reject the null in composite and financial risk ratings. All tests strongly reject the null in MSCI index and economic risk rating series for the frontier countries sample. From the panel unit root tests, we can only conclude that at least one or some of the panels are stationary. This is consistent with the unit root tests applied to individual series, which yielded *I(0)-I(1)* mixed results. The results of the panel unit root tests are given in Appendix-A.

4.3. Panel Cointegration Tests

Pedroni's (1999) panel cointegration tests are used to test whether the series in the panels have long-run equilibrium relationships (cointegrated). The advantage of the Pedroni’s cointegration test is that it is applicable to heterogoneous panels with medium to large N and large T, and with one or more nonstationary regressors. It provides seven statistics under a null of no cointegration: panel-*v*, *rho*, group-*rho*, panel-*t* (non-parametric), group-*t* (non-parametric), panel-*adf* (parametric *t*), and group-*adf* (parametric *t*).

Panel cointegration tests all strongly reject the null of no-cointegration for all the sub-samples (developed, emerging and frontier) and for the full sample when both disaggregated and composite risk ratings are used as independent variables. This provides strong evidence in favor of the main hypothesis in this study that there should be a long run relation between disaggregated (and composite) risk ratings and stock market index returns. The cointegration test results are given in Appendix-B.

4.4. Cross-Sectional Dependence Tests

For each of the methods (DFE, PMG, MG) to estimate the ARDL, CS-ARDL and CS-DL regressions, cross-sectional dependence test statistics are calculated to check whether there is significant dependence of errors across cross-sectional units. As discussed before, unobserved global factors may simultaneously affect all cross-sectional units, creating a cross-sectional dependence of errors, which can lead to biased estimates if these unobserved common factors are correlated with the regressors (Chudik, Pesaran, Mohaddes and Raissi, 2013). The results of the cross-sectional dependence tests for different samples, estimation methods and lags are discussed and interpreted in the Empirical Results section.

4.5. Hausman Tests

As discussed earlier, the DFE estimation method assumes homogeneity in cross-sectional coefficients for both short- and long-run relations; PMG assumes heterogeneity in short-run coefficients while assuming homogeneity in the long-run coefficients. The MG estimator allows heterogeneity in both short- and long-run coefficients. If the long-run coefficients are actually heterogeneous across cross-sectional units, then the DFE method may produce biased results, while the MG method is consistent in any case. However, the PMG estimator is efficient (and consistent) if parameter homogeneity holds. To test parameter homogeneity, Hausman test is used in this study. The Hausman test compares an estimator θ_1 (known to be consistent under both the null and alternative hypothesis) with θ_2 (known to be efficient and consistent under the null, but inconsistent otherwise). The null hypothesis is that θ_2 is efficient and consistent, in which case there should be no systematic difference between θ_1 and θ_2. If the null is rejected, which is an indication of systematic difference between θ_1 and θ_2, there is evidence that the assumptions on which the efficient estimator is based are doubtful. Therefore, the consistent estimator (θ_1) is selected in this case. If the test fails to reject the null hypothesis, the efficient (and consistent) estimator (θ_2) is selected. In our case, the MG estimator is the consistent estimator under both the null and the alternative hypothesis, while the PMG and DFE estimators are efficient (and consistent) under the null, but inconsistent otherwise. The results of the Hausman tests for different samples, estimation methods and lags are discussed and interpreted in the Empirical Results section.

4.6. Empirical Results

The results of the empirical tests are presented in 4 different samples (developed countries, emerging countries, frontier countries, the full sample). For each sample, two different sets of independent variables are considered: disaggregated risk ratings and composite risk ratings. Furthermore, for each sample and different set of independents, three different specifications are used to estimate the long-run coefficients: classical ARDL, Cross-Sectionally Augmented ARDL (CS-ARDL) and Cross-Sectionally Augmented DL (CS-DL). For the classical ARDL, three different estimation methods (Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG)) are used. For the CS-ARDL specification, only PMG and MG estimators, and finally, for the CS-DL specification only MG estimator is employed.

The empirical model proposed in this study is based on the CS-DL results due to the reasons to be explained in the following section. Therefore, only the results tables of the CS-DL approach are provided in the next section, while the results of the other approaches (Classical ARDL and CS-ARDL) are also discussed with their respective strengths and weaknesses, which lead to the selection of the CS-DL method as the basis for the proposed empirical model. The classical ARDL and CS-ARDL results tables are given in Appendix-C for completeness.

In the classical ARDL specification, the coefficient of the dummy variable that marks the beginning of the 2008 global crisis is always statistically significant for all lag orders and estimation alternatives, indicating that the 2008 crisis indeed affected countries globally. Thus, to investigate whether there is any structural break due to the 2008 global crisis (i.e. whether there is a change in the long-run coefficients after the crisis), the sample was also divided into two time periods (before the 2008 crisis and afterwards) and the same procedure was applied to each time period. The results of this analysis are discussed in Section-4.6.3 and corresponding Tables are given in Appendix-D.

4.6.1. Composite Risk Ratings and Stock Market Index Returns

4.6.1.1. Developed Countries

4.6.1.1.1. Classical Panel ARDL Approach

The results of the classical panel ARDL approach provide strong evidence of a long-run relation between composite risk rating and stock market index returns in the developed country sample (Table-C1). The coefficient of the composite risk rating is negative as expected and highly significant in all estimation alternatives (DFE, PMG, MG) and lag specifications 1 to 6 (all at 1%). The PMG and MG estimators yield coefficient values very close to each other (around -0.2), while the DFE estimator gives a much lower value (around -0.09). This implies that a one percent permanent increase (decrease) in composite credit rating is associated with an average 20 basis points decrease (increase) in monthly index returns. Furthermore, the coefficients are robust to different lag orders from 1 to 6; they fall into a narrow range (-0.081; -0.099) for DFE, (-0.195; -0.223) for PMG, and (-0.193; -0.237) for MG. The speed of adjustment coefficients are also highly significant (all at 1%) in all estimation alternatives and lag specifications. They also fall into a narrow range (-0.900; -0.950) for DFE, (-0.919; -0.967) for PMG, and (-0.936; -0.975) for MG. The speed of adjustment values are quite high, implying that any disequilibrium is corrected quickly once the system is shocked. The coefficient of the dummy variable is also highly significant (all at 1%) for all estimation alternatives and lag specifications. The range of coefficients of the dummy variable for different lag specifications and estimation methods are even narrower; (-0.015; -0.017) for DFE, (-0.020; -0.022) for PMG and (-0.023; -0.025) for MG. This indicates that the 2008 global financial crisis has a significant effect on stock market index returns; specifically, on average the crisis resulted in a decrease in monthly equity returns.

For each lag specification, the Hausman test is used to select the appropriate model among the DFE, PMG and MG estimators. As discussed before, the Hausman test compares two estimators, one of which is known to be consistent under both the null and the alternative hypothesis, and the other is known to be efficient (and consistent) under the null, but inconsistent otherwise. In this sense, the MG estimator is known to be consistent under both parameter homogeneity and heterogeneity, while the PMG and DFE estimates are efficient (and consistent) under parameter homogeneity but inconsistent if parameters are heterogeneous across cross sectional units. Thus the Hausman test can be used to compare the MG estimator with the PMG and to compare MG with DFE.

In this framework, the Hausman test selects PMG between MG and PMG estimators, while it selects MG between MG and DFE estimators for all lag specifications 1 to 6. In other words, there seems to be a systematic difference between the MG and DFE estimations, while there is no systematic difference between the MG and PMG estimators. Therefore, the DFE estimation (which the Hausman test suggests to be inconsistent) is eliminated. Between the remaining two (the PMG and MG) the PMG is selected, which is efficient (and consistent) under the null.

The PMG being selected for all lag specifications, the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) are used to comment on selecting among different lag orders. In that sense, AIC and BIC suggest ARDL(1,1), both giving the smallest value of the information criterion. This model finds a long-run coefficient of -0.195, a speed of adjustment coefficient of -0.939 and a dummy variable coefficient of -0.021. The signs of these coefficients are all as expected and they are all highly significant (all at 1%). They suggest that a one percent permanent increase (decrease) in the composite risk rating is associated with 19.5 basis points decrease (increase) in the stock market index monthly returns (2.34 percentage points annually) in the long-run equilibrium. The high and negative speed of adjustment implies a rapid re-adjustment to equilibrium when the system is shocked. Finally, this model shows that, after the 2008 global crisis, there is a 2.1 basis points decrease, on average, in stock market index monthly returns.

However, for all estimation alternatives (DFE, PMG and MG) and lag specifications (from 1 to 6), there is strong evidence of cross-sectional error dependence between cross-sectional units. According to Chudik, Pesaran, Mohaddes and Raissi (2013), cross-sectional dependence of errors in panel time series may lead to biased estimates if unobserved global factors that simultaneously affect all cross-sectional units are also correlated with the regressors. The cross-sectional dependence (CD) test of Pesaran (2004, 2013) yields very large statistics for all estimation alternatives and lag specifications, which ranges from 165.05 (for 1-lag DFE) to 159.39 (for 6-lags MG). Considering that the distribution of the CD test statistic is standard normal, these results indicate strong cross-sectional error dependence; thus they might be misleading and should be interpreted with caution. To deal with the cross-sectional error dependence CS-ARDL and CS-DL methods are employed in the following sections.

4.6.1.1.2. CS-ARDL Approach

The first method used in this study to account for the cross-sectional error dependence that is apparent in the classical ARDL approach is the cross-sectionally augmented autoregressive distributed lag (CS-ARDL) approach. The CS-ARDL approach, which was developed by Chudik and Pesaran (2015), augments the classical ARDL specification with cross-sectional averages of the dependent variable, the regressors and a sufficient number of their lags. The specification is given in Eq-14.

The results of the CS-ARDL approach based on two different estimation alternatives (PMG and MG) are given in Table-C2. As mentioned before, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders when the cross-sectional averages of the dependent variable, the regressors and a sufficient number of their lags are also included in the specification. Indeed, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 7[12]. To obtain estimates for lag order 3, however, a truncation lag order of 6 is also selected for information purposes.

The results in Table-C2 show that long-run coefficient estimates of the PMG and MG approaches are close to each other for lag orders 1 and 2. The PMG estimates of the long-run coefficient fall into a narrow range (-0.063; -0.064) both being highly significant (at 1%); while the MG estimates range between -0.062 and -

[12] Since the longest time dimension in the panel is 358, the truncation lag order [$T^{1/3}$] is 7.

0.076 (-0.062 at 10% significance; -0,076 at 5% significance). For both estimation methods, the long-run coefficient seems to be robust to different lag orders.

The Hausman test fails to reject the null that there is no systematic difference between the PMG and MG estimates for lag orders 1 and 2; therefore the efficient (and consistent) estimator PMG is selected. PMG being selected, the AIC and BIC criteria both suggest lag order of 2, which corresponds to a long-run coefficient of -0.064. This implies that, on average, a 1% permanent increase (decrease) in the composite risk rating is associated with 6.4 basis points decrease (increase) in country stock market monthly index returns (which makes 0.768 percentage points annually). The sign of the coefficient is negative as expected, meaning that higher rating (lower risk) is associated with lower return and vice versa.

The coefficient of the dummy variable, which was highly significant in the classical ARDL specification, loses its significance; probably because the effect of the 2008 global crisis is embedded in the cross-sectional averages of the dependent variable, independent variable and a sufficient number of their lags that account for unobserved common factors and spillover effects.

There is substantial decrease, as compared to the classical ARDL, in the cross-sectional dependence test statistics from around 165 to -11.81. However, this statistics is still statistically significant, indicating that there is still dependence of errors in the cross-sectional units. Therefore, the results should be interpreted with caution.

Another word of caution is that, the speed of adjustment coefficients are smaller than -1 for all lag orders and estimation alternatives, which casts doubt into the error correction approach. The speed of adjustment coefficient should be between 0 and -1 in order for the ECM approach to be appropriate.

4.6.1.1.3. CS-DL Approach

The second method used in this study to account for the cross-sectional error dependence that is apparent in the classical ARDL approach is the cross-sectionally augmented distributed lag (CS-DL) approach. As opposed to the CS-ARDL approach, the CS-DL approach estimates the long-run coefficients directly without estimating short-run coefficients first. In this respect, the CS-DL approach is immune to the concern that the speed of adjustment coefficient should be between -1 and 0 in order for the error-correction approach to be appropriate in the ARDL and CS-ARDL approaches. The CS-DL specification is given in Eq-17.

Table-1 shows the long-run coefficient estimates of the CS-DL approach. Since the maximum length of the time dimension is 358 for the developed country sample, p_x is set equal to 7, which is the integer part of $T^{1/3}$. Coefficient estimates for different lag orders (1 to 7) are also obtained and shown in Table-1.

Table-1 indicates strong evidence of a long-run relation between composite risk ratings and stock market index returns. The coefficients of the composite risk rating are statistically significant for all lag orders 1 to 7. The coefficients are significant at 1% level for all lags, except for the lag 1, for which the significance level is 10%. The sign of the coefficients are all negative as expected; indicating a negative long-run relation between composite risk rating and stock market index returns (lower returns for higher ratings (lower risk) and higher returns for lower ratings (higher risk)). The magnitude of the coefficients for lag orders 1 to 7 falls into the range (-0.061, -0.104). The robustness of the coefficients to lag orders becomes apparent for higher lag orders (3 to 7). In other words, starting from the third lag order, the range that the long-run coefficients fall into becomes narrower and they tend to converge to a value around -0.095. This is an indication that the long-run equilibrium is reached in around 3 months once the system is shocked, which is consistent with the speed of adjustment coefficient of -0.939 suggested by the classical ARDL approach (Table-C1-This coefficient suggests that 93.9% of remaining deviation from equilibrium is corrected each period, implying that equilibrium is reached in around 3 months, after which 99.98% of any deviation is corrected).

Thus, the long-run coefficient is taken as the average of estimated coefficients for lags 3 to 7, which makes -0.096. This implies that a permanent increase in the composite risk rating is associated with 9.6 basis points decrease in monthly stock market index returns, which makes 1.15 percentage points annually. Therefore, since increased composite risk rating means lower risk, a one percent permanent increase in country (composite) risk is associated with an average 1.15 percentage points increase in annual return. The sign of the coefficient is negative as expected, meaning that higher rating (lower risk) is associated with lower return and vice versa.

This result is consistent with the main hypothesis of the study that country risk may have bearings on stock market returns and that higher risk should be associated with higher returns. However, the cross-sectional dependence test statistics show that, although there is substantial decrease in the test statistics as compared to the classical ARDL approach (from around 160 to around 12), there still remains statistically significant degree of cross-sectional dependence. Therefore, the results should be interpreted with this consideration.

One last comment is that the coefficient of the dummy variable loses its significance for all lag specifications, which is somewhat expected because of the inclusion of cross-sectional averages of the regressors, dependent variable and a sufficient number of their lags in the specification, which already accounts for spillover effects and common global factors, possibly including the 2008 global crisis.

Table 1: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Composite Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	CS-DL (p=1, p_x=7)	CS-DL (p=2, p_x=7)	CS-DL (p=3, p_x=7)	CS-DL (p=4, p_x=7)	CS-DL (p=5, p_x=7)	CS-DL (p=6, p_x=7)	CS-DL (p=7, p_x=7)
θ	**-0.061*** **(0.054)**	**-0.074***** **(0.006)**	**-0.095***** **(0.000)**	**-0.094***** **(0.001)**	**-0.104***** **(0.000)**	**-0.096***** **(0.001)**	**-0.091***** **(0.004)**
γ	-0.000 (0.863)	-0.000 (0.845)	-0.000 (0.872)	-0.000 (0.920)	-0.000 (0.888)	-0.001 (0.851)	-0.001 (0.847)
η	**0.000**** **(0.031)**	**0.000**** **(0.029)**	**0.000**** **(0.025)**	**0.000**** **(0.035)**	**0.000**** **(0.035)**	**0.000**** **(0.038)**	**0.000**** **(0.049)**
CD test statistics	**-12.22***** **(0.000)**	**-12.15***** **(0.000)**	**-12.13***** **(0.000)**	**-12.03***** **(0.000)**	**-12.03***** **(0.000)**	**-11.94***** **(0.000)**	**-11.88***** **(0.000)**
Observations	8033	8033	8033	8033	8033	8033	8033

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i ' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = lnC_{it}$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnC_{it} is the natural logarithm of Composite Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\ldots 7$, $p_y=0$, $p_x=7$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.1.2. Emerging Countries

4.6.1.2.1. Classical Panel ARDL Approach

The strong evidence found by the classical panel ARDL approach in the Developed Country Sample is also present in the Emerging Country Sample (Table-C3). Coefficient of the composite risk rating is always negative and highly significant for all lag specifications 1 to 6, and for all estimation alternatives DFE, PMG and MG. Within DFE and PMG estimators, the coefficients are robust to different lag orders and fall into a narrow range for different lag specifications; (-0.058; -0.072) for DFE and (-0.101; -0.113) for PMG. This range is somewhat wider for the MG estimator: (-0.096; -0.155).

The speed of adjustment coefficients are all negative and statistically highly significant (all at 1%) for all lag specifications and estimation alternatives. However, for lag 6, the PMG and MG estimators yield speed of adjustment coefficients smaller than -1, therefore lag-6 coefficients are discarded. Thus, the range of coefficients (for lag 1 to 5) is (-0.930; -0.952) for DFE, (-0.926; -0.961) for PMG and (-0.930; -0.977) for MG.

Within each estimation alternative, the coefficient for the 2008 dummy variable almost does not change across different lag orders; it is between (-0.025; -0.027) for DFE, between (-0.029; -0.032) for PMG; and between (-0.034; -0.036) for MG. The trend coefficient is also highly significant for all alternatives; however, its magnitude is approximately zero; therefore economically insignificant.

Between MG and PMG, the Hausman test selects PMG for all lag specifications. Between MG and DFE, the Hausman test selects DFE for lags 1, 2, 4, and 5; however selects MG for lag-3. Therefore for lag 3, PMG is selected overall. For the remaining lag orders (1, 2, 4, 5, 6), a choice between PMG and DFE is needed. For these lags, the Hausman test statistics comparing MG and DFE is closer to rejection of the null hypothesis than that of comparing MG and PMG, which is considered as an indication of closeness to parameter heterogeneity. Therefore, to be on the safe side, the PMG estimation is selected against DFE.

The PMG being selected among the estimation alternatives, both AIC and BIC criteria suggest ARDL(4,4), as it gives the lowest value for both of the information criteria. This model suggests a long-run coefficient of -0.113, a speed of adjustment coefficient of -0.954 and a dummy coefficient of -0.030. Thus, this model suggests that a one percent increase (decrease) in the composite risk ratings is associated with 11.3 basis points decrease (increase) in monthly stock market index returns. The speed of adjustment is quite high; 95.4% of any remaining deviation from the equilibrium is corrected in a single period. The coefficient of the dummy variable shows that on average there is 3 basis points decrease in monthly stock returns after the 2008 financial crisis, ceterus paribus.

Similar to the Developed Country Sample, the Pesaran's CD test shows considerable cross-sectional dependence of errors; the CD test statistics are in the order of 90's for all lag specifications and estimation alternatives, including ARDL(4,4)-PMG estimation (91.95). Although the CD test statistics are comparatively smaller than those of the Developed Country Sample, they are still very large and statistically highly significant, suggesting that the results should be interpreted with caution.

4.6.1.2.2. CS-ARDL Approach

To deal with the cross-sectional error dependence problem, CS-ARDL method is employed first. The CS-ARDL results are shown in Table-C4. Due to the relatively long time dimension requirement of the ARDL approach (which becomes even longer when cross-sectional averages are added in CS-ARDL) we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 3. Therefore, Table-C4 includes results based on lag orders from 1 to 3 with the truncation lag order set equal to 6[13].

For each lag order, the PMG and MG estimation methods both give very close results, which are highly significant and also robust to different lag orders. The PMG estimates yield coefficients ranging between (-0.088; -0.097), while the MG estimates are between (-0.081; -0.090). The coefficients of the dummy and trend

[13] Since the longest time dimension in the panel is 310, the truncation lag order is $[T^{1/3}]=6$.

variables are statistically and economically insignificant, which is somewhat expected, given that the cross-sectional averages included in the specification already account for a considerable part of unobserved common factors and spillover effects.

For all lag orders 1 to 3, the Hausman test fails to reject the null that differences between coefficient estimates are not systematic. Therefore, the efficient (and consistent) estimator (PMG) is selected for all lag orders. Given PMG as the selected estimation method, the AIC and BIC criteria both suggest lag order 3, as it gives the smallest value of the information criterion. This model suggests a long-run coefficient of -0.088, meaning that a one percent increase in the composite risk rating is associated with 8.8 basis points decrease in monthly stock market index returns, which makes 1.056 percentage points annually.

There are three issues with the CS-ARDL results shown in Table-C4: First, for all lag orders and estimation alternatives, the speed of adjustment coefficients are smaller than -1. If the error-correction approach is appropriate, then the speed of adjustment coefficient should be between -1 and 0. Second, coefficient estimates for lag orders larger than 3 could not be calculated due to the restrictions mentioned above. Third, Pesaran’s CD test show that, although a substantial decrease as compared to the classical ARDL approach, there is still considerable error dependence across cross-sectional units. All in all, the results shown in Table-C4 should be interpreted with caution.

4.6.1.2.3. CS-DL Approach

The CS-DL approach, which is the second method used to eliminate cross-sectional error dependence, yields similar results to those of the classical ARDL and CS-ARDL. Table-2 shows the long-run coefficient estimates of the CS-DL approach. Since the maximum length of the time dimension is 310 for the emerging country sample, p_x is set equal to 6, which is the integer part of the time dimension ($T^{1/3}$). Coefficient estimates for different lag orders (1 to 6) are also obtained and shown in Table-2. For all lag orders, the coefficients are statistically significant (at 5% for lags 1 to 5 and at 1% for lag 6). The sign of the coefficients are all negative as expected; indicating a negative long-run relation between composite risk rating and stock market index returns (lower returns for higher ratings (lower risk) and higher returns for lower ratings (higher risk)). From lag 1 to lag 6, long-run coefficient estimates fall into a range (-0.076; -0.123). This range gets narrower starting from lag 4, and the long-run coefficient seems to converge to a value around -0.110. This is an indication that the long-run equilibrium is reached in around 4 months once the system is shocked. If this is compared with the speed of adjustment coefficient (-0.954) suggested by the classical ARDL, it seems consistent, because 95.4% adjustment rate means that in 4 months 100% of any remaining deviation from equilibrium is corrected.

Thus, the long-run coefficient is taken as the average of estimated coefficients for lags 4 to 6, which makes -0.113. This implies that a permanent increase in the composite risk rating is associated with 11.3 basis points decrease in monthly stock market index returns, which makes 1.35 percentage points annually. Therefore, since increased composite risk rating means lower risk, a one percent permanent increase in country (composite) risk is associated with an average 1.35 percentage points increase in annual return. The sign of the coefficient is negative as expected, meaning that higher rating (lower risk) is associated with lower return and vice versa.

This result is consistent with the main hypothesis of the study that country risk may have bearings on stock market returns and that higher risk should be associated with higher returns. However, the cross-sectional dependence test statistics show that although there is substantial decrease in the test statistics as compared to the classical ARDL approach (from around 90 to around 11) there still remains statistically significant degree of cross-sectional dependence. While the results should be interpreted with this consideration, this is the best result we can obtain.

Finally, it is observed that the coefficient of the dummy variable loses its significance for all lag specifications, which is somewhat expected because of the inclusion of cross-sectional averages in the regressions.

The CS-DL approach offer solutions to two of the three issues mentioned in the previous section. First, since the CS-DL approach calculates long-run coefficients directly (it does not use the error-correction approach), it is immune to the consideration that speed of adjustment coefficient should be between -1 and 0.

Second, since it does not require a long time dimension as the ARDL approach does, coefficient estimates can be obtained for longer lags. However, the CD test statistics are still statistically significant; suggesting that the CS-DL approach is not able to fully eliminate cross-sectional error dependence.

Table 2: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Composite Risk Ratings, Emerging Countries Sample, 1988m01-2013m10)

	CS-DL ($p=1, p_x=6$)	**CS-DL ($p=2, p_x=6$)**	**CS-DL ($p=3, p_x=6$)**	**CS-DL ($p=4, p_x=6$)**	**CS-DL ($p=5, p_x=6$)**	**CS-DL ($p=6, p_x=6$)**
θ	**-0.076**** **(0.044)**	**-0.090**** **(0.027)**	**-0.091**** **(0.023)**	**-0.105**** **(0.018)**	**-0.110**** **(0.023)**	**-0.123***** **(0.007)**
γ	0.003 (0.430)	0.003 (0.414)	0.003 (0.421)	0.004 (0.359)	0.003 (0.436)	0.004 (0.362)
η	-0.000 (0.162)	-0.000 (0.137)	-0.000 (0.128)	**-0.000*** **(0.094)**	-0.000 (0.102)	**-0.000*** **(0.089)**
CD test statistics	**-11.44***** **(0.000)**	**-11.39***** **(0.000)**	**-11.32***** **(0.000)**	**-11.23***** **(0.000)**	**-11.20***** **(0.000)**	**-11.10***** **(0.000)**
Observations	5688	5688	5688	5688	5688	5688

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i ' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = lnC_{it}$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnC_{it} is the natural logarithm of Composite Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear time trend, and $p=1,2,3,\ldots 6$, $p_y=0$, $p_x=6$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.1.3. Frontier Countries

4.6.1.3.1. Classical Panel ARDL Approach

Table-C5 shows the results of the classical panel ARDL approach for the frontier countries sample. The strong evidence found by the classical ARDL approach in the Developed and Emerging Country Samples weakens in the Frontier Country Sample. For lag1, PMG and MG estimators yield statistically insignificant coefficient estimates, while DFE estimator gives a statistically significant (at 5%) estimate of -0.074. For lags 5 and 6, coefficient estimates by MG are insignificant. For all other lags and estimation alternatives, coefficient estimates are always negative and significant at different significance levels. DFE estimator yields statistically significant coefficient estimates for all lag orders. These estimates range from -0.074 to -0.097, all being significant at the 1% level except that of lag 1, which is significant at 5%. The significant coefficient estimates given by PMG estimator ranges from -0.051 to -0.076. MG estimator seems to yield considerably higher estimates, significant of which range from -0.184 to -0.203.

Speed of adjustment coefficients are all highly significantly (all at 1%) negative and between (-1, 0) range for all lag orders and estimation alternatives that give significant long-run coefficient estimates. They fall into the range (-0.836, -0.919) for DFE, (-0.850, -0.978) for PMG and (-0.897, -0.920) for MG[14].

Within each estimation alternative that give a significant long-run coefficient estimate, the coefficient for the 2008 dummy variable almost does not change across different lag orders; it is between (-0.032; -0.035) for DFE, between (-0.028; -0.031) for PMG; and between (-0.035; -0.037) for MG. The trend coefficient is also highly significant for all alternatives; however, its magnitude is approximately zero; therefore economically insignificant.

Between MG and PMG, the Hausman test suggests PMG for lags 1,4,5,6; but suggests MG for lags 2 and 3. Between MG and DFE, the Hausman test suggests DFE for all lag specifications. Therefore, for lags 2 and 3, PMG and MG estimation

[14] These ranges correspond to lag orders that give a significant long-run coefficient for a particular estimation alternative.

alternatives are eliminated and DFE is selected. For the remaining lag specifications, it remains to select between DFE and PMG estimation alternatives. For these specifications (lags 1, 4, 5 and 6), the Hausman test statistics comparing MG and PMG is closer to rejection of the null hypothesis than that of comparing MG and DFE, which is considered as an indication of closeness to parameter heterogeneity. Therefore, to be on the safe side, the DFE estimation is selected against PMG.

The DFE being selected among the estimation alternatives, it remains to select among different lag orders. Since likelihood information is not available for the DFE estimator, average of the coefficients for different lags is taken as the overall coefficient estimate. This number is -0.087. All estimates for different lag orders are significant at 1% level (except for the lag 1, which is significant at 5%). The average coefficient for the speed of adjustment is -0.870. For all lags, speed of adjustment coefficient estimates are highly significant (at 1%). The average coefficient for the dummy variable is -0.033 and it is highly significant for all lags (at 1%). These results suggest that a one percent increase (decrease) in the composite risk ratings is associated with 8.7 basis points decrease (increase) in monthly stock market index returns. The speed of adjustment coefficient of -0.87 suggests that 87% of any remaining deviation from the equilibrium is corrected in a single period. The coefficient of the dummy variable shows that on average there is 3.3 basis points decrease in monthly stock returns in the Frontier Country Sample after the 2008 financial crisis, ceterus paribus.

Similar to the Developed and Emerging Country Samples, the Pesaran's CD test shows considerable cross-sectional dependence of errors; the CD test statistics are in the order of 30-40's for all lag specifications and estimation alternatives, including the DFE estimation method, for which the CD test statistics is as high as 47.09. Although the CD test statistics are comparatively smaller than those of the Developed and Emerging Country Samples, they are still very large and statistically highly significant, suggesting that the results should be interpreted with caution.

4.6.1.3.2. CS-ARDL Approach

As before, CS-ARDL method is employed first to deal with the cross-sectional error dependence problem. The CS-ARDL results for the frontier countries sample are shown in Table-C6. Due to the relatively long time dimension requirement of the ARDL approach (which becomes even longer when cross-sectional averages are added in CS-ARDL) we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 3. Therefore, Table-C6 includes results based on lag orders from 1 to 3 with the truncation lag order set equal to 6[15].

For each lag order, the PMG and MG estimation methods give quite different results, which also change considerably across different lag orders. The PMG estimates yield statistically insignificant coefficients for all lag specifications, while the MG estimates are significant at 10% for lags 2 and 3. These coefficients are -0.257 for lag 2 and -0.327 for lag 3. As can be seen, these estimates are not robust to increasing lag orders. The coefficients of the dummy and trend variables are statistically and economically insignificant, which is somewhat expected, given that the cross-sectional averages included in the specification already account for unobserved common factors and spillover effects.

For all lag orders 1 and 3, the Hausman test fails to reject the null that differences between coefficient estimates are not systematic. Therefore, the efficient (and consistent) estimator (PMG) is selected for these lag orders. For lag 2, the Hausman test rejects the null that differences in coefficient estimates are not systematic; thus MG estimator is selected for this lag. For the PMG alternative, the AIC and BIC criteria both suggest lag order 3, for which the long-run coefficient estimate is statistically insignificant. For the MG alternative (lag 2), the coefficient estimate is -0.257, meaning that a one percent increase in the composite risk rating is associated with 25.7 basis points decrease in monthly stock market index returns, which makes 3.084 percentage points annually. This is quite a large number

[15] Since the longest time dimension in the panel is 310, the truncation lag order is $[T^{1/3}]=6$.

economically, casting doubt on the hypothesis that country risk ratings is related to stock markets in the frontier countries sample.

There are four issues with the CS-ARDL results shown in Table-C6: First, for all lag orders and estimation alternatives, the speed of adjustment coefficients are smaller than -1. If the error-correction approach is appropriate, then the speed of adjustment coefficient should be between -1 and 0. Second, coefficient estimates for lag orders larger than 3 could not be calculated due to the restrictions mentioned above. Third, Pesaran's CD test show that, although a substantial decrease as compared to the classical ARDL approach, there is still considerable error dependence across cross-sectional units[16]. Fourth, the coefficient estimates are not robust and vary considerably across increasing lag orders. All in all, they do not provide strong evidence of a long-run relation between country risk ratings and stock market returns in this sample of countries.

4.6.1.3.3. CS-DL Approach

The CS-DL approach, which is the second method used to eliminate cross-sectional error dependence, shows no evidence of long-run relation between composite risk ratings and stock market returns. Table-3 shows the long-run coefficient estimates of the CS-DL approach. Since the maximum length of the time dimension is 310 for the frontier countries sample, p_x is set equal to 6, which is the integer part of the time dimension ($T^{1/3}$). Coefficient estimates for different truncation lag orders (1 to 6) are also obtained and shown in Table-3. For all lag orders, the coefficients are statistically insignificant and in one of them (for lag 1) the long-run coefficient is positive, which is counterintuitive.

The coefficients of the dummy variable and trend term are insignificant for all lag specifications, which is somewhat expected because of the inclusion of cross-sectional averages in the regressions. Since the panel turns out to be highly unbalanced, the Pesaran's CD test statistics cannot be calculated.

[16] CD test statistics are calculated for a narrower time interval (2008m06, 2013m10) since in all other wider time intervals the panel becomes highly unbalanced, for which the Pesaran CD test statistics cannot be calculated. Nevertheless, they provide evidence of cross-sectional error dependence as in wider time intervals CD test statistics tend to increase.

These results are not consistent with the main hypothesis of the study that country risk may have bearings on stock market returns and that higher risk should be associated with higher returns. In other words, for the frontier countries sample, this study is not able to find any strong evidence of a long-run relation between composite country risk ratings and stock market returns.

Table 3: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Composite Risk Ratings, Frontier Countries Sample, 1984m01-2013m10)

	CS-DL (p=1, p_x=6)	**CS-DL (p=2, p_x=6)**	**CS-DL (p=3, p_x=6)**	**CS-DL (p=4, p_x=6)**	**CS-DL (p=5, p_x=6)**	**CS-DL (p=6, p_x=6)**
θ	0.004 (0.975)	-0.103 (0.409)	-0.075 (0.569)	-0.058 (0.708)	-0.075 (0.643)	-0.069 (0.722)
γ	-0.003 (0.573)	-0.002 (0.626)	-0.003 (0.568)	-0.003 (0.506)	-0.004 (0.415)	-0.004 (0.368)
η	0.000 (0.956)	0.000 (0.877)	0.000 (0.970)	0.000 (0.691)	0.000 (0.217)	**0.000**** **(0.027)**
CD test statistics	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Observations	3603	3603	3603	3603	3603	3603

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il}\, \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it}$ $=lnC_{it}$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnC_{it} is the natural logarithm of Composite Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\ldots 6$, $p_y=0$, p_x=6. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Since the panel is highly unbalanced, the Pesaran CD test statistics cannot be calculated. Numbers in parenthesis are p-values.

4.6.1.4. Full Sample

After looking at different sub-samples, this section investigates the hypothesized long-run relation for the full sample, which includes developed, emerging and frontier countries. However, as discussed before, some of the countries in the frontier countries sample are not included in the full sample, since in that case the panel becomes so unbalanced that Pesaran's CD test statistics cannot be calculated. Therefore, those countries that have highly unbalanced data in the Frontier Sample are excluded from the full sample just until the full panel becomes sufficiently balanced and CD test statistics can be calculated. This sample is called "Restricted Full Sample". It will shortly be called "Full Sample" in the coming sections.

We believe that this operation does not cause any significant loss of information, because we already know from the previous section that there is no strong evidence of long-run relation between composite risk ratings and stock market returns in the frontier countries. Therefore, being able to include all of them in the full sample would most probably weaken the evidence in the full sample, and in that case we would in any case have to exclude them and run the analysis with a panel that includes only developed and emerging countries.

4.6.1.4.1. Classical Panel ARDL Approach

For the Full Sample, the results of the classical panel ARDL approach provide strong evidence of a long-run relation between composite risk rating and stock market index returns (Table-C7). The coefficient of the composite risk rating is negative as expected and highly significant in all estimation alternatives (DFE, PMG, MG) and lag specifications 1 to 6 (all at 1%). A visual inspection gives the sense that there are differences between coefficient estimates of the three estimation alternatives (DFE, PMG and MG), although for a given estimation method, coefficients seem robust to increasing lag orders. In this sense, MG estimator yields coefficient values higher than the other two (in the range -0.143 and -0.186), DFE yielding the lowest estimates (in the range -0.048 and -0.057). The PMG estimates fall into the range -0.106 and -0.130.

The speed of adjustment coefficients are also highly significant (all at 1%) in all estimation alternatives and lag specifications. They also fall into a narrow range (-0.924; -0.962) for DFE, (-0.933; -0.975) for PMG and (-0.940; -0.998) for DFE. The speed of adjustment values are quite high, implying that any disequilibrium is corrected quickly once the system is shocked. The coefficient of the dummy variable is also highly significant (all at 1%) for all estimation alternatives and lag specifications. The range of coefficients of the dummy variable for different lag specifications and estimation methods are even narrower; (-0.018; -0.018) for DFE; (-0.024; -0.025) for PMG; and (-0.028; -0.029) for MG. This indicates that the 2008 global financial crisis has a significant effect on stock market index returns; specifically, the crisis resulted in a decrease in monthly equity returns. The trend term also yields highly significant coefficients, but they are all economically insignificant.

Consistent with the visual observation that long-run coefficient estimates seem to be quite different across DFE, PMG and MG estimation alternatives, the Hausman test suggests that there is statistically significant differences between DFE, PMG and MG estimations. For all lag specifications, the Hausman test suggests MG against DFE, and for lags 1, 2, 3 and 4, the Hausman tests suggests MG against PMG. For lags 5 and 6, the Hausman test suggests PMG, however in these cases, the Hausman test statistics is quite close to the rejection region, therefore to be on the safe side (to avoid parameter heterogeneity bias), the consistent estimator MG is selected for all lags.

The MG being selected for all lag specifications, the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) are used to comment on selecting among different lag orders. In that sense, AIC and BIC suggest ARDL(6,6), both giving the smallest value of the information criterion. This model finds a long-run coefficient of -0.153, a speed of adjustment coefficient of -0.998 and a dummy variable coefficient of -0.029. The signs of these coefficients are all as expected and they are all highly significant (all at 1%). They suggest that a one percent permanent increase (decrease) in the composite risk rating is associated with

15.3 basis points decrease (increase) in the stock market index monthly returns (1.84 percentage points annually) in the long-run equilibrium. The high and negative speed of adjustment implies a rapid re-adjustment to equilibrium when the system is shocked. Finally, this model shows that, after the 2008 global crisis, there is a 2.9 basis points decrease, on average, in stock market index monthly returns.

However, for all estimation alternatives (DFE, PMG and MG) and lag specifications (from 1 to 6), there is strong evidence of cross-sectional error dependence between cross-sectional units. According to Chudik, Pesaran, Mohaddes and Raissi (2013), cross-sectional dependence of errors in panel time series may lead to biased estimates if unobserved global factors that simultaneously affect all cross-sectional units are also correlated with the regressors. The cross-sectional dependence (CD) test of Pesaran (2004, 2013) yields very large statistics for all estimation alternatives and lag specifications, which ranges from 226.1 (for 6-lag PMG) to 233.5 (for 6-lags DFE). Considering that the distribution of the CD test statistic is standard normal, these results indicate strong cross-sectional error dependence; thus they might be misleading and should be interpreted with caution. To deal with the cross-sectional error dependence CS-ARDL and CS-DL methods are employed in the following sections.

4.6.1.4.2. CS-ARDL Approach

The results of the CS-ARDL approach based on two different estimation alternatives (PMG and MG) are given in Table-C8. As mentioned before, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders when the cross-sectional averages of the dependent variable, the regressors and a sufficient number of their lags are also included in the specification. Indeed, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 7[17]. To obtain estimates for lag order 3, however, a truncation lag order of 6 is also selected for information purposes.

[17] Since the longest time dimension in the panel is 358, the truncation lag order $[T^{1/3}]$ is 7.

The results in Table-C8 show that for all lag specifications and estimation alternatives, the long-run coefficients are negative as expected and highly significant (all at 1%). The PMG estimates fall into a narrow range (-0.062; -0.070) both being highly significant (at 1%); while the MG estimates range between -0.078 and -0.088 (both being highly significant at 1%).

The Hausman test rejects the null that there is no systematic difference between the PMG and MG estimates for lag orders 1 and 2; therefore the consistent estimator MG is selected. MG being selected, the AIC and BIC criteria both suggest lag order of 2, which corresponds to a long-run coefficient of -0.088. This implies that, on average, a 1% permanent increase (decrease) in the composite risk rating is associated with 8.8 basis points decrease (increase) in country stock market monthly index returns (which makes 1.056 percentage points annually). The sign of the coefficient is negative as expected, meaning that higher rating (lower risk) is associated with lower return and vice versa.

The coefficient of the dummy variable, which was highly significant in the classical ARDL specification, loses its significance; probably because the effect of the 2008 global crisis is embedded in the cross-sectional averages of the dependent variable, independent variable and a sufficient number of their lags that account for unobserved common factors and spillover effects.

There is substantial decrease, as compared to the classical ARDL, in the cross-sectional dependence test statistics from around 230 to -7.44. However, this statistics is still statistically significant, indicating that there is still dependence of errors in the cross-sectional units. Therefore, the results should be interpreted with caution.

Finally, the speed of adjustment coefficients are smaller than -1 for all lag orders and estimation alternatives, which casts doubt into the error correction approach. The speed of adjustment coefficient should be between 0 and -1 in order for the ECM approach to be appropriate.

4.6.1.4.3. CS-DL Approach

The long-run coefficient estimates of the CS-DL approach are given in Table-4. Since the maximum length of the time dimension is 358 for the full sample, p_x is set equal to 7, which is the integer part of the time dimension ($T^{1/3}$). Coefficient estimates for different lag orders (1 to 7) are also obtained and shown in Table-4.

Table-4 indicates strong evidence of a long-run relation between composite risk ratings and stock market index returns for the full sample. The coefficients of the composite risk rating are statistically highly significant for all truncation lag orders 1 to 7. The coefficients are significant at the 1% level for all lag specifications. The sign of the coefficients are all negative as expected; indicating a negative long-run relation between composite risk rating and stock market index returns (lower returns for higher ratings (lower risk) and higher returns for lower ratings (higher risk)). The magnitude of the coefficients for lag orders 1 to 7 falls into the range (-0.071, -0.106). The robustness of the coefficients to lag orders becomes apparent for higher lag orders (5 to 7). In other words, starting from the fifth lag order, the range that the long-run coefficients fall into becomes narrower and they tend to converge to a value around -0.107. This is an indication that the long-run equilibrium is reached in around 5 months once the system is shocked.

Thus, the long-run coefficient is taken as the average of estimated coefficients for lags 5 to 7, which makes -0.107. This implies that a permanent increase in the composite risk rating is associated with 10.7 basis points decrease in monthly stock market index returns, which makes 1.28 percentage points annually. Therefore, since increased composite risk rating means lower risk, a one percent permanent increase in country (composite) risk is associated with an average 1.28 percentage points increase in annual return. The sign of the coefficient is negative as expected, meaning that higher rating (lower risk) is associated with lower return and vice versa.

This result is consistent with the main hypothesis of the study that country risk may have bearings on stock market returns and that higher risk should be associated with higher returns. However, the cross-sectional dependence test statistics show that, although there is substantial decrease in the test statistics as compared to the classical ARDL approach (from around 230 to around 7.6), there still remains statistically significant degree of cross-sectional dependence. Therefore, the results should be interpreted with this consideration.

The coefficient of the dummy variable loses its significance for all lag specifications, which is somewhat expected because of the inclusion of cross-sectional averages of the regressors, dependent variable and a sufficient number of their lags in the specification, which already accounts for spillover effects and common global factors, possibly including the 2008 global crisis.

Table 4: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Composite Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	CS-DL ($p=1,p_x=7$)	**CS-DL ($p=2,p_x=7$)**	**CS-DL ($p=3,p_x=7$)**	**CS-DL ($p=4,p_x=7$)**	**CS-DL ($p=5,p_x=7$)**	**CS-DL ($p=6,p_x=7$)**	**CS-DL ($p=7,p_x=7$)**
θ	**-0.071*** (0.000)**	**-0.079*** (0.000)**	**-0.093*** (0.000)**	**-0.096*** (0.000)**	**-0.108*** (0.000)**	**-0.108*** (0.000)**	**-0.106*** (0.000)**
γ	-0.001 (0.603)	-0.001 (0.660)	-0.001 (0.639)	-0.001 (0.759)	-0.001 (0.657)	-0.000 (0.844)	-0.001 (0.651)
η	0.000 (0.105)	**0.000* (0.094)**	**0.000* (0.095)**	**0.000* (0.098)**	0.000 (0.110)	**0.000* (0.096)**	**0.000* (0.077)**
CD test statistics	**-7.94*** (0.000)**	**-7.87*** (0.000)**	**-7.75*** (0.000)**	**-7.70*** (0.001)**	**-7.69*** (0.000)**	**-7.68*** (0.000)**	**-7.62*** (0.000)**
Observations	15185	15185	15185	15185	15185	15185	15185

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i ' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \, \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = lnC_{it}$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis, T is a linear trend term and $p=1,2,3\ldots6$, $p_y=0$, $p_x=7$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.2. Disaggregated Risk Ratings and Stock Market Index Returns

The analysis in the preceding sections shows that there is statistically significant evidence of a long-run relation between composite country risk ratings and stock market index returns. The effect of composite risk ratings on stock market returns is dynamic and its effect occurs over time in as long as 5-6 months. This result is consistent with the findings of Erb, Harvey and Viscanta (1996), who found that Institutional Investor's semiannual composite risk ratings are related to next period's (6 months ahead) country stock market returns.

However, composite ratings are made up of sub-components and it would be interesting and useful to discern the relative effects of these sub-components (political, economic and financial) to stock market returns. This section is devoted to investigate this possibility. As in the composite rating case, each country group (Developed, Emerging and Frontier) is analyzed in turn, followed by the full sample analysis.

4.6.2.1. Developed Countries

4.6.2.1.1. Classical Panel ARDL Approach

Table-C9 shows the results of the classical panel ARDL approach. DFE estimator yields insignificant long-run coefficient estimates for political and financial risk ratings for all lag orders, but find statistically highly significant (all at 1%) coefficient estimates for economic risk rating in all lag specifications. The economic risk ratings coefficients are all negative as expected and fall into a narrow range (-0.057; -0.066) across increasing lag orders 1 to 6. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.906; -0.954). The coefficient of the dummy variable is even more robust to lag; it is almost constant across increasing lag orders (ranges between -0.020 and -0.021). The trend term is also significant across different lags, except lag 6, but it is economically insignificant (0.000) for all lags.

PMG estimator yields statistically significant long-run coefficient estimates of political risk ratings for lag orders 1, 2, 3 and 4 (all at 5%), but they become statistically insignificant for lags 5 and 6. The significant coefficient estimates of political risk rating fall into a narrow range (-0.037; -0.046). Financial risk rating coefficient is significant for all lag orders except lag 1, at significance levels 5% for lags 2, 3, 5, 6, and at 10% for lag 4. The range of significant coefficients for financial risk rating is (-0.026; -0.032). Economic risk rating coefficient is statistically highly significant for all lag orders, all at 1% and it ranges between -0.112 and -0.145. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.944; -0.975). The coefficient of the dummy variable is even more robust to lag; it is almost constant across increasing lag orders (ranges between -0.028 and -0.029). The trend term is also highly significant across different lags, but it is economically insignificant (0.000 for all lags).

Finally, MG estimator yields statistically significant long-run coefficient estimates for all sub-components and lag specifications. Coefficient estimates of political risk rating component range from -0.059 to -0.084, at 1% significance for lags 1, 3, 4 and at 5% significance for lags 2, 5, 6. Coefficient estimates of financial risk rating component range from -0.050 to -0.078; at 1% significance for lags 2, 3, 4, 5, 6 and at 5% significance for lag 1. Coefficient estimates of economic risk rating component are statistically highly significant for all lag specifications (all at 1%) and fall into a range (-0.104; -0.143). The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.956; -1.013). The coefficient of the dummy variable is even more robust to increasing lag and ranges between -0.035 and -0.038. The trend term is not significant across different lags in this case, but it is still economically insignificant (0.000 for all lags).

For all estimation alternatives and lag specifications, the Pesaran's CD test indicates strong cross-sectional dependence of errors. The CD-test statistics ranges from 151.07 to 163.55, all being very large given that the CD-test statistics is standard normally distributed.

To select from among the three estimation alternatives, the Hausman test is used as before. Between MG and PMG the Hausman test suggests PMG for all lag specifications except lag 1, for which the test statistics is quite close to the rejection region. Therefore MG is selected against PMG to be on the safe side (in relation to the parameter heterogeneity bias). Between MG and DFE, the Hausman test rejects for all lags the null that differences in parameter estimates are not systematic; therefore MG is selected against DFE. Thus the MG estimator is selected overall.

The MG estimator being selected, AIC and BIC criteria are used to select the best model across different lag orders. In this respect, both AIC and BIC suggest ARDL(6,6,6,6), for which the value of the information criterion is smallest. However, this model yields a speed of adjustment coefficient of -1.013, which is smaller than -1[18]; therefore the very next model suggested by the information criterion and that has a speed of adjustment coefficient between 0 and -1 is selected. This model is ARDL (3,3,3,3). For this model, coefficient estimates of political, financial and economic risk ratings are all negative and statistically highly significant (all at 1%). The estimates for political, financial and economic risk ratings are -0.084, -0.077 and -0.120, respectively, implying that a one percent increase (all other being constant) in political, financial and economic ratings are associated with 1.008, 0.924 and 1.44 percentage points decrease, respectively, in annual stock returns.

The selected model ARDL(3,3,3,3) gives a statistically highly significant (at 1%) speed of adjustment coefficient of -0.989. This coefficient implies that any deviation from equilibrium is corrected in at most 3 months[19], which is consistent with the selected model ARDL(3,3,3,3).

The coefficient of the dummy variable given by the selected model is -0.037 and it is statistically highly significant at 1%. This implies that, all other factor assumed to be constant, the 2008 global crisis has a significant and negative effect on monthly stock returns; after the 2008 crises, monthly stock market returns decreases on average by 3.7 basis points, which makes 0.44 percentage points annually.

The problem with the results of this model (ARDL(3,3,3,3,)) is that there is strong evidence of cross-sectional error dependence across cross sectional units. Pesaran's CD test yields a large statistics of 156.09, which is statistically highly

[18] In order for the error-correction approach to be appropriate, speed of adjustment coefficient should be between -1 and 0.

[19] With this speed of adjustment rate, 98.9% of any remaining disequilibrium is corrected each month. Therefore, cumulative correction rates will be 98.9% in the first month, 99.9% in the second month and 100% in the third month.

significant (at 1%). The results of the model, therefore, should be interpreted with this consideration.

4.6.2.1.2. CS-ARDL Approach

To solve the cross-sectional error dependence problem, the CS-ARDL approach is used first. Table-C10 shows the results. As discussed earlier, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders in the case of CS-ARDL when the cross-sectional averages are also included in the specification. Indeed, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 3[20].

The results in Table-C10 show that coefficient estimates are not robust to different estimation methods and increasing lag specifications. PMG finds that political and economic risk rating coefficients are statistically significant for lag 1, but for lag 2, financial and economic risk ratings coefficients become significant. Similarly, MG estimator yields significant estimates of political and economic risk ratings for lag 1, but for lag 2, none of the three rating components have significant coefficients. Speed of adjustment coefficients are statistically significant for all lag orders and estimation alternatives. However, they are smaller than -1 for both PMG and MG in the case of 2 lags. Therefore this lag specification is eliminated. It remains only the models for 1 lag, among which PMG is suggested by the Hausman test. This model gives statistically significant coefficients for political and economic risk ratings (-0.032 at 5% significance and -0.096 at 1% significance respectively). Financial risk coefficient is insignificant in this model. The speed of adjustment coefficient is -0.737, which is highly significant (at 1%) and has expected sign.The coefficient for the dummy variable is also statistically significant at 1%; its magnitude is -0.018. The coefficient of the trend term is significant as well but it is economically insignificant (its value is 0.000).

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[20] Since the longest time dimension in the panel is 358, the maximum truncation lag order [$T^{1/3}$] should be 7. However, the system could not be solved for 7 lags; thus lower lag values were tried in turn. 3 lags was the maximum, for which the sistem could be solved.

The CD-test statistics show that there is still significant cross-sectional dependence of errors although the magnitude of this statistics decreased substantially (to -11.91) as compared to the classical ARDL results (where the CD-test statistics were in the order of 160).The presence of cross-sectional error dependence calls for caution in interpreting these results.

4.6.2.1.3. CS-DL Approach

To eliminate the cross-sectional dependence of errors, CS-DL approach is used as a second alternative. Table-5 shows the results. Since the maximum length of the time dimension is 358 for the developed countries sample, p_x is set equal to 7, which is the integer part of $T^{1/3}$. Coefficient estimates for different lag orders *p* (1 to 7) are also obtained and shown in Table-5.

Coefficient estimates of financial risk rating seem to lose their statistical significance: This coefficient is significant for only lag 3. The significance is not robust to different lag orders; coefficient estimates for lags 1, 2, 4, 5, 6 and 7 are insignificant.

Political risk rating coefficients are significant for lags 1, 2 and 7 (all at 10%), but they are not significant for lags 3, 4, 5 and 6. However, the insignificance is at around 11-12%. The sign of this coefficient is negative as expected for all lags and its magnitude falls into the range (-0.040; -0.064) across lags 1 to 7. However, this range gets narrower starting from lag 5, at which it seems to converge to a value around -0.060. Therefore, the long-run coefficient of political risk rating is taken as the average of values corresponding to lags 5 to 7, which turns out to be -0.061.

Table-5 provides evidence of a long-run relation between economic risk rating and stock market returns for this sample: Long-run coefficient estimates of economic risk rating are all negative as expected and statistically significant for lags 3 to 7 (at 1%, 5% and 10%). They fall into the range (-0.038; -0.091); however, this range becomes considerably narrower starting from lag 4.Therefore, the long-run coefficient estimate for the economic risk rating is taken as the average of estimates for lags 4 to 7, which is -0.078.

The coefficient of the dummy variable is insignificant for all lag orders, which is somewhat expected because the model includes cross sectional averages and their lags, which are supposed to account for unobserved common factors and spillover effects. The trend term turns out to be significant for lags 1, 3, 4, 5, 6, but they are all economically insignificant (0.000).

The problem with the results in Table-5 is that there is still significant evidence of cross-sectional error dependence for all lag specifications. Although there is substantial decrease as compared to the classical ARDL results (CD test statistics were around 160), the CD-statistics are still significant (the lowest value is –11.26). Therefore, as usual, the results should be interpreted with this consideration.

Table 5: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	CS-DL (p=1, p_x=7)	CS-DL (p=2, p_x=7)	CS-DL (p=3, p_x=7)	CS-DL (p=4, p_x=7)	CS-DL (p=5, p_x=7)	CS-DL (p=6, p_x=7)	CS-DL (p=7, p_x=7)
θ_{lnP}	**-0.048*** **(0.061)**	**-0.040*** **(0.098)**	-0.042 (0.110)	-0.049 (0.119)	-0.061 (0.109)	-0.057 (0.107)	**-0.064*** **(0.069)**
θ_{lnF}	-0.021 (0.348)	-0.032 (0.134)	**-0.041*** **(0.075)**	-0.040 (0.146)	-0.043 (0.125)	-0.034 (0.279)	-0.016 (0.714)
θ_{lnE}	-0.026 (0.155)	-0.024 (0.283)	**-0.038*** **(0.075)**	**-0.067***** **(0.008)**	**-0.074**** **(0.019)**	**-0.080**** **(0.027)**	**-0.091*** **(0.076)**
γ	-0.000 (0.915)	-0.000 (0.870)	-0.001 (0.868)	0.000 (0.956)	-0.000 (0.982)	-0.000 (0.928)	-0.000 (0.978)
η	**0.000*** **(0.061)**	0.000 (0.121)	**0.000*** **(0.054)**	**0.000**** **(0.042)**	**0.000*** **(0.083)**	**0.000*** **(0.069)**	0.000 (0.102)
CD test statistics	**-11.94***** **(0.000)**	**-11.89***** **(0.000)**	**-11.82***** **(0.000)**	**-11.66***** **(0.000)**	**-11.63***** **(0.000)**	**-11.48***** **(0.000)**	**-11.26***** **(0.000)**
Observations	8033	8033	8033	8033	8033	8033	8033

Notes: The cross-sectionally augmented Panel DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il}\Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il}\Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il}\, \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\dots 7$, $p_y=0$, $p_x=7$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.2.2. Emerging Countries

4.6.2.2.1. Classical Panel ARDL Approach

Table-C11 shows the results of the classical panel ARDL approach. DFE estimator yields statistically significant negative long-run coefficient estimates of political and economic risk rating for all lag orders. Coefficient estimates of political risk rating are significant at 1% for all lags and they fall into a narrow range (-0.061; -0.072), while coefficient estimates of economic risk rating range between -0.028 and -0.038. Economic risk rating estimations are significant at 10% for lags 1, 2 and 3; and at 5% for lags 4, 5 and 6. It is interesting that coefficient estimates of financial risk rating are all positive and statistically significant for lags 1, 2, and 3 (all at 10%), but it becomes statistically insignificant for lags 4, 5 and 6. Nevertheless, a positive coefficient is counterintuitive. The range of significant coefficients for financial risk rating is (0.028; 0.030). The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.938; -1.004). The coefficient of the dummy variable is robust to lag changes and ranges between -0.029 and -0.032. The trend term is also highly significant across different lags, but it is economically insignificant (0.000 for all lags).

PMG estimator yields statistically significant long-run coefficient estimates for all sub-components and lag specifications. However, similar to DFE estimator, coefficient estimates of financial risk rating are counterintuitively positive. Coefficient of political risk rating component ranges from -0.053 to -0.075; at 1% significance for lags 1, 2, 3, 4, 5 and at 5% significance for lag 6. Coefficient of financial risk rating component ranges between 0.038 and 0.050; at 1% significance for lag 6 and at 5% significance for lags 1, 2, 5; and at 10% significance for lags 3 and 4. Coefficient of economic risk rating component is statistically highly significant for all lag specifications (all at 1%) and fall into a range (-0.069; -0.090). The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.934; -1.052). The coefficient of the dummy variable is quite robust to increasing lags and ranges between -0.034 and -

0.040. The trend term is significant across all lags, but it is economically insignificant (0.000 for all lags).

Finally, MG estimator yields insignificant long-run coefficient estimates for political and financial risk ratings for all lag orders, but find statistically significant (at 5% significance level for lags 1, 2, 3, 4; at 1% for lags 5 and 6) coefficient estimates for economic risk rating in all lag specification. Economic risk ratings coefficients are all negative as expected and fall into a narrow range (-0.073; -0.092) across increasing lag orders 1 to 6. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.947; -1.131). The coefficient of the dummy variable ranges between -0.045 and -0.057, is quite robust to lag and greater in absolute value than other samples. The trend term is also significant across different lags, but it is economically insignificant (0.000) for all lags.

For all estimation alternatives and lag specifications, the Pesaran's CD test indicates strong cross-sectional dependence of errors. The CD-test statistics ranges from 83.83 to 92.67, all being very large given that the CD-test statistics is standard normally distributed.

To select from among the three estimation alternatives, the Hausman test is used as before. Between MG and PMG the Hausman test suggests PMG for all lag specifications. Therefore PMG is selected against MG. Between MG and DFE, the Hausman test fails to reject for lags 1, 2, 3, 4 the null that differences in parameter estimates are not systematic; therefore DFE is selected against MG for these lag specifications. However, test statistics comparing MG and DFE are closer to the rejection region than those statistics comparing MG and PMG. Indeed, for lags 5 and 6, the Hausman test rejects the null and suggests the consistent estimator MG.

The PMG estimator being selected, AIC and BIC criteria are used to select the best model across different lag orders. In this respect, both AIC and BIC suggest ARDL(6,6,6,6), for which the value of the information criterion is smallest. However, this model yields a speed of adjustment coefficient of -1.052, which is smaller than -1[21]; therefore the very next model suggested by the information criterion and that has a speed of adjustment coefficient between 0 and -1 is selected. This model is ARDL (4, 4, 4, 4). For this model, coefficient estimates of political and economic risk ratings are all negative and statistically highly significant (all at 1%). The estimates for political and economic risk ratings are -0.060 and -0.081 respectively, implying that a one percent increase (all other being constant) in political and economic ratings are associated with 0.72 and 0.972 percentage points decrease, respectively, in annual stock returns.

The selected model ARDL(4, 4, 4, 4) gives a statistically highly significant (at 1%) speed of adjustment coefficient of -0.977. This coefficient implies that any deviation from equilibrium is corrected in at most 3 months[22].

The coefficient of the dummy variable given by the selected model is -0.035 and it is statistically highly significant at 1%. This implies that, all other factor assumed to be constant, the 2008 global crisis has a significant and negative effect on monthly stock returns; after the 2008 crises, monthly stock market returns decreases on average by 3.5 basis points, which makes 0.42 percentage points annually.

The problem with the results of this model (ARDL(4, 4, 4, 4,)) is that there is strong evidence of cross-sectional error dependence across cross sectional units. Pesaran's CD test yields a large statistics of 86.52, which is statistically highly significant (at 1%). The results of the model, therefore, should be interpreted with this consideration.

4.6.2.2.2. CS-ARDL Approach

To solve the cross-sectional error dependence problem, the CS-ARDL approach is used first. Table-C12 shows the results. As discussed earlier, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders in the case of CS-ARDL when the cross-sectional

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[21] In order for the error-correction approach to be appropriate, speed of adjustment coefficient should be between -1 and 0.

[22] With this speed of adjustment rate, 97.7% of any remaining disequilibrium is corrected each month. Therefore, cumulative correction rates will be 97.7% in the first month, 99.95% in the second month and 100% in the third month.

averages are also included in the specification. Indeed, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 3[23].

The results in Table-C12 show that coefficient estimates are not robust to different estimation methods and increasing lag specifications. PMG finds that political and economic risk rating coefficients are negative and statistically significant for lag 1 (-0.043 and -0.045 respectively, and both at 5%), but for lag 2, only political risk rating coefficient (-0.070) is significant (at 1%). PMG estimator yields a positive and significant estimate of financial risk rating coefficient for lag one, but this counterintuitive result disappears for lag two, in which the coefficient is negative but insignificant. Similarly, MG estimator yields insignificant estimates of political and economic risk ratings for lag 1, but finds a positive and significant coefficient for financial risk rating, which is counterintuitive. For lag 2, only political risk rating coefficient estimate is significant (-0.105 at 1%). Speed of adjustment coefficients are statistically significant for all lag orders and estimation alternatives. However, they are smaller than -1 for both PMG and MG in the case of 2 lags. Therefore this lag specification is eliminated. It remains only the models for 1 lag, among which PMG is suggested by the Hausman test. This model gives statistically significant coefficients for political and economic risk ratings (-0.043 at 5% significance and -0.045 at 5% significance respectively). Financial risk coefficient is highly significant and positive (0.048 at 1% significance) in this model. The speed of adjustment coefficient is -0.870, which is highly significant (at 1%) and has expected sign. The coefficient for the dummy variable is also statistically significant at 1%; its magnitude is -0.021. The coefficient of the trend term is significant as well but it is economically insignificant (its value is 0.000).

The CD-test statistics show that there is still significant cross-sectional dependence of errors although the magnitude of this statistics decreased substantially (-11.06) as compared to the classical ARDL results (where the CD-test statistics were

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[23] Since the longest time dimension in the panel is 310, the maximum truncation lag order [$T^{1/3}$] should be 6.However, the system could not be solved for 6 lags; thus lower lag values were tried in turn. 3 lags was the maximum, for which the sistem could be solved.

in the order of 90s).The presence of cross-sectional error dependence calls for caution in interpreting these results.

4.6.2.2.3. CS-DL Approach

To eliminate the cross-sectional dependence of errors, CS-DL approach is used as a second alternative. Table-6 shows the results. Since the maximum length of the time dimension is 310 for the emerging countries sample, p_x is set equal to 6, which is the integer part of $T^{1/3}$. Coefficient estimates for different lag orders *p* (1 to 6) are also obtained and shown in Table-6.

Table-6 shows that there is strong evidence that political risk rating is associated with stock market returns in the long-run. For all lag specifications 1 to 6, political risk rating coefficient estimates are statistically significant (at 1% or lags 2, 3 and 6; at 5% for lags 1, 4 and 5). The sign of this coefficient is negative as expected for all lags and its magnitude falls into the range (-0.062; -0.099) across lags 1 to 6. However, this range gets narrower starting from lag 2. Therefore, the long-run coefficient of political risk rating is taken as the average of values corresponding to lags 2 to 5, which turns out to be -0.087.

Coefficient estimates of financial risk rating are insignificant for all lag orders. Economic risk rating has a negative and significant coefficient estimates for lags 1 and 2 (-0.044 and -0.047, respectively, both at 10% significance). However, for lags greater than 2, the coefficient of economic risk rating loses its significance.

The coefficient of the dummy variable is insignificant for all lag orders, which is somewhat expected because the model includes cross sectional averages and their lags, which are supposed to account for unobserved common factors and spillover effects.

The trend term turns out to be insignificant for all lags; also they are all economically insignificant (0.000).

The problem with the results in Table-6 is that there is still significant evidence of cross-sectional error dependence for all lag specifications. Although there is substantial decrease as compared to the classical ARDL results (CD test statistics were around 80), the CD-statistics are still significant (the lowest value in absolute terms is 10.11). Therefore, as usual, the results should be interpreted with this consideration.

Table 6: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2013m10)

	CS-DL (p=1, p_x=6)	CS-DL (p=2, p_x=6)	CS-DL (p=3, p_x=6)	CS-DL (p=4, p_x=6)	CS-DL (p=5, p_x=6)	CS-DL (p=6, p_x=6)
θ_{lnP}	**-0.062** (0.040)**	**-0.083*** (0.006)**	**-0.083*** (0.004)**	**-0.080** (0.017)**	**-0.089** (0.012)**	**-0.099*** (0.004)**
θ_{lnF}	-0.001 (0.972)	-0.004 (0.912)	0.006 (0.840)	-0.019 (0.602)	-0.009 (0.821)	-0.020 (0.662)
θ_{lnE}	**-0.044* (0.073)**	**-0.047* (0.088)**	-0.041 (0.117)	-0.034 (0.187)	-0.035 (0.199)	-0.038 (0.292)
γ	-0.001 (0.892)	-0.001 (0.795)	-0.002 (0.771)	-0.002 (0.770)	-0.001 (0.786)	-0.002 (0.729)
η	-0.000 (0.595)	-0.000 (0.704)	-0.000 (0.842)	0.000 (0.842)	0.000 (0.785)	0.000 (0.945)
CD test statistics	**-11.12*** (0.000)**	**-11.03*** (0.000)**	**-10.86*** (0.000)**	**-10.55*** (0.000)**	**-10.33*** (0.000)**	**-10.11*** (0.000)**
Observations	5688	5688	5688	5688	5688	5688

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\ldots 6$, $p_y=0$, $p_x=6$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.2.3. Frontier Countries

4.6.2.3.1. Classical Panel ARDL Approach

Table-C13 shows the results of the classical panel ARDL approach. DFE estimator yields statistically significant negative long-run coefficient estimates of political and economic risk rating for all lag orders. Coefficient estimates of political risk rating are significant at 5% for lags 1, 2, 5, 6, and at 10% for the remaining lags. They fall into a narrow range (-0.045; -0.054), while coefficient estimates of economic risk rating range between -0.068 and -0.077. Economic risk rating estimations are highly significant (at 1%) for all lag orders. Coefficient estimates of financial risk rating is positive for lag 1 (0.038, at 10%), but loses significance for the remaining lags. Nevertheless, a positive coefficient is counterintuitive. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.856; -0.937). The coefficient of the dummy variable is robust to lag changes and ranges between -0.036 and -0.039. The trend term is also significant across different lags, but it is economically insignificant (0.000 for all lags).

PMG estimator yields statistically highly significant long-run coefficient estimates for economic risk rating in all lag specifications. However, lag 1 and lag 2 yield positive coefficient estimates for financial risk rating, which is counterintuitive. Nevertheless, this significance disappears in the remaining lag orders. Coefficients of political risk rating component are all insignificant for all lag specifications. The range of economic risk rating coefficient estimates is (-0.080; -0.108), all being significant at 1%. The two positive and significant coefficient estimates for financial risk rating are 0.055 (at 5%) and 0.046 (at 10%) for lags 1 and 2, respectively. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into a relatively wide range (-0.768; -0.910). The coefficient of the dummy variable is quite robust to increasing lags and ranges between -0.033 and -0.037. The trend term is significant across all lags, but it is economically insignificant (0.000 for all lags).

Finally, MG estimator yields insignificant long-run coefficient estimates for political risk ratings for all lag orders, but find statistically significant (at 1% significance level for lags 1, 2, 4; at 5% for lags 3, 5 and 6) coefficient estimates for economic risk rating in all lag specifications. Financial risk rating coefficients are also insignificant for all lags except lag 1 and lag 6, for which estimates are counterintuitively positive and large in magnitude (0.191 for lag 1 and 0.256 for lag 6, both being significant at 5%). Economic risk ratings coefficients are all negative as expected and fall into a relatively wide range (-0.095; -0.237) across increasing lag orders 1 to 6. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.918; -1.149). The coefficient of the dummy variable ranges between -0.037 and -0.044, and is quite robust to lag. The trend term is also significant across different lags, but it is economically insignificant (0.000) for all lags.

For all estimation alternatives and lag specifications, the Pesaran's CD test indicates strong cross-sectional dependence of errors. The CD-test statistics ranges from 23.25 to 44.86, all being very large given that the CD-test statistics is standard normally distributed.

To select from among the three estimation alternatives, the Hausman test is used as before. Between MG and PMG the Hausman test suggests PMG for lags 2, 3, 4 and 5. For lags 1 and 6, the Hausman test suggests MG against PMG. Similarly, between MG and DFE the Hausman test suggests DFE for lags 2, 3, 4, 5; and suggests MG for lags 1 and 6. Therefore for lags 1 and 6, MG is selected against DFE and PMG. However, for lag 6, the speed of adjustment coefficient of the MG estimate is smaller than -1, therefore this lag is discarded. For lags 2, 3, 4 and 5, it remains to choose between PMG and DFE. For lags 2, 3 and 4, Hausman test statistics between MG and DFE are closer to the rejection region as compared to the Hausman test between MG and PMG. In other words, parameter estimates of the DFE estimator seem to be "more" different than what the consistent estimator estimates (MG) as compared to the PMG estimator. Therefore, to be on the safe side, PMG is selected for lags 2, 3 and 4. For lag 5, it is the opposite according to the Hausman test: parameter estimates of the PMG estimator seem to be "more" different than what the consistent estimator estimates (MG) as compared to the DFE estimator. Therefore, for lag 5, DFE estimator is selected.

In summary, for lag 1 MG is selected, for lags 2, 3 and 4, PMG is selected and for lag 5 DFE is selected. To select among these, AIC and BIC criteria are used. However, DFE estimator for lag 5 (ARDL(5,5,5,5) does not have AIC or BIC criteria values. To proxy for its information criterion, however, AIC and BIC values of PMG and MG estimates for this lag is used. And these values turn out to be the minimum among the information criteria values of the MG estimator for lag 1, and of the PMG estimator for lags 2, 3, and 4. Therefore, DFE estimator ARDL(5,5,5,5) is selected overall.

The selected model ARDL(5,5,5,5) with DFE yields significant coefficent estimates for political (-0.041 at 5%) and economic risk ratings (-0.071 at 1%) and they are both negative as expected. However, coefficient of financial risk rating is insignificant. These results imply that a one percent increase in political risk rating is associated with 4.1 basis points decrease in monthly stock returns in the long-run (0.492 percentage points annually). In a similar vein, a one percent increase in economic risk rating is associated with 7.1 basis points decrease in monthly stock returns in frontier countries, which makes 0.852 percentage points annually.

The model gives a speed of adjustment coefficient of -0.871, which is highly significant at 1%. This coefficient implies that any deviation from equilibrium is corrected in about 5 months[24], which is consistent with the lag of the selected model, ARDL(5,5,5,5).

The coefficient estimate of the dummy variable,-0.036, is negative and also highly significant at 1%. This implies that in frontier countries, the 2008 global crisis has a 3.6 basis negative effect on monthly stock returns, all other factors held constant.

Finally, the coefficient estimate of the trend term is significant, but it is at the same time economically insignifcant (its magnitude is 0.000).

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[24] With this speed of adjustment rate, 87.1% of any remaining disequilibrium is corrected each month. Therefore, cumulative correction rates will be 87.1% in the first month, 98.34% in the second month, 99.79% in the third month, 99.97% in the forth month and 100% in the fifth month.

The problem with the results of this model (DFE estimation of ARDL(5, 5, 5, 5,)) is that there is strong evidence of cross-sectional error dependence across cross sectional units. Pesaran's CD test yields a large statistics of 40.81, which is statistically highly significant (at 1%). The results of the model, therefore, should be interpreted with this consideration.

4.6.2.3.2. CS-ARDL Approach

To solve the cross-sectional error dependence problem, the CS-ARDL approach is used first. Table-C14 shows the results. As discussed earlier, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders in the case of CS-ARDL when the cross-sectional averages are also included in the specification. Indeed, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 3 [25].

The results in Table-C14 show that PMG gives statistically significant political and financial risk ratings coefficient estimates for lags 1 and 2, while for both of the lags economic risk rating coefficient estimates are insignificant. The sign of the political risk coefficient is negative as expected for both lags (-0.048 and -0,085 for lags 1 and 2, respectively) and significant at 10% for lag 1 and at 5% for lag 2. However, the sign of the financial risk coefficient is unexpectedly positive for lags 1 and 2 (0.068 and 0.042, respectively) and significant for both lags (at 1% for lag 1, at 10% for lag 2). This implies that increasing financial risk rating (meaning a decrease in country risk) is associated with increasing stock market index expected returns in the long-run, which is counterintuitive.

MG estimates of the long-run coefficients shown in Table-C14 present a different character than the PMG estimates. In the MG case, financial and economic risk rating coefficients (0.299 and -0.111, respectively) are significant for lag 1 (at 1% and 10% significance, respectively) but they are both insignificant for lag-2.

[25] Since the longest time dimension in the panel is 310, the maximum truncation lag order [$T^{1/3}$] should be 6. However, the system could not be solved for 6 lags; thus lower lag values were tried in turn. 3 lags was the maximum, for which the sistem could be solved.

Financial risk rating coefficient is still positive for lag 1 as in the case of PMG estimates. Political risk rating coefficients are insignificant for both lags.

For lag 2, the speed of adjustment coefficients of PMG and MG estimates are both smaller than -1, therefore they are discarded and only lag 1 is considered for selection between PMG and MG estimates. In this sense, the Hausman test fails to reject the null that differences in parameter estimates are not systematic, therefore it suggests the efficient (and consistent) estimator PMG against MG.

The selected model (Lag 1 PMG) yields significant coefficients for political (-0.048 at 10%) and financial risk ratings (0.068 t 1%); but an insignificant estimate for economic risk rating. While the coefficient estimate of political risk rating is negative as expected, that of financial risk is counter-intuitively positive. The speed of adjustment coefficient (-0.851) is highly significant and between 0 and -1 as expected. This rate implies that any deviation from equilibrium is corrected in 6 months[26]. The coefficient of the dummy variable is still significant (at 1%) and negative (-0.022), implying that the 2008 global crisis affected frontier countries and monthly stock returns decreased 2.2 basis points on average after the crisis. The trend term is statistically and economically insignificant.

The CD-test statistic for this model (lag 1 PMG) shows that there is still significant cross-sectional dependence of errors although the magnitude of this statistics decreased substantially (to -4.98) as compared to the classical ARDL results (where the CD-test statistics were in the order of 40s).

4.6.2.3.3. CS-DL Approach

To eliminate the cross-sectional dependence of errors, CS-DL approach is used as a second alternative. Table-7 shows the results. Since the maximum length of the time dimension is 310 for the frontier countries sample, p_x is set equal to 6, which is the integer part of the time dimension ($T^{1/3}$). Coefficient estimates for different lag orders p (1 to 6) are also obtained and shown in Table-7.

[26] With this speed of adjustment rate, 85.1% of any remaining disequilibrium is corrected each month. Therefore, following a one unit shock to equilibrium, cumulative correction rates will be 85.1% in the first month, 97.78% in the second month, 99.67% in the third month, 99.95% in the forth month, 99.99% in the fifth month and 100% in the sixth month.

Table-7 shows that there is no evidence that political risk rating is related to stock market return in the long run. For all lags 1 to 6, coefficient estimates of political risk rating are insignificant. Financial risk rating coefficient turns out to be significant for only lag 1 (at 10%), but insignificant for all the remaining lags 2, 3, 4, 5, 6. Furthermore its coefficient for lag 1 is positive and relatively large (0.322). Coefficient estimates of economic risk rating are all negative and significant for lags 1, 2 and 5, 6. They are insignificant for lags 3 and 4. The significant coefficient estimates (at 5% significance level for lags 2, 5, 6 and at 1% for lag 1) for economic risk rating fall into a wide range (-0.164; -0.271). The coefficient estimates of the dummy variable and trend term are all statistically insignificant for all lag specifications. Overall, Table-7 shows that economic risk rating is negatively associated with monthly stock market return, but the magnitude of this relation is not clear for this sample.

Cross-sectional error dependence test cannot be performed for this sample, because the panel is highly unbalanced. Therefore Pesaran's CD test statistics are not reported in Table-7.

Table 7: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2013m10)

	CS-DL (p=1; p_x=6)	**CS-DL (p=2; p_x=6)**	**CS-DL (p=3; p_x=6)**	**CS-DL (p=4; p_x=6)**	**CS-DL (p=5; p_x=6)**	**CS-DL (p=6; p_x=6)**
θ_{lnP}	-0.202 (0.352)	-0.178 (0.562)	0.182 (0.659)	0.096 (0.832)	0.330 (0.516)	0.225 (0.767)
θ_{lnF}	**0.322*** **(0.057)**	0.207 (0.302)	0.200 (0.498)	-0.346 (0.328)	0.021 (0.935)	0.077 (0.763)
θ_{lnE}	**-0.164***** **(0.008)**	**-0.178**** **(0.023)**	-0.114 (0.379)	0.130 (0.734)	**-0.240**** **(0.029)**	**-0.271**** **(0.045)**
γ	-0.005 (0.450)	-0.003 (0.602)	-0.006 (0.448)	-0.002 (0.850)	-0.002 (0.841)	-0.002 (0.811)
η	0.001 (0.035)	0.001 (0.396)	0.001 (0.368)	0.001 (0.437)	0.001 (0.398)	0.002 (0.282)
CD test statistics	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Observations	3630	3559	2325	3231	3208	3185

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\ldots 6$; $p_y=0$; $p_x=6$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.2.4. Full Sample

4.6.2.4.1. Classical ARDL Approach

Table-C15 shows the results of the classical panel ARDL approach. DFE estimator yields statistically highly significant (all at 1%) long-run coefficient estimates for political, financial and economic risk ratings for all lag orders. The coefficients of political and economic risk ratings are negative as expected for all lag orders; however, the coefficient estimates of financial risk rating are all positive, which is counterintuitive. The range of coefficient estimates for political risk rating is (-0.032; -0.042), for financial risk is (0.022; 0.025) and for economic risk is (-0.042; -0.048). The speed of adjustment coefficients are also highly significant (all at 1%) for all lag orders and they fall into the range (-0.934; -0.975). The coefficient estimates for the dummy variable is the same for all lag orders (-0.023), they are all significant at 1%. The trend term is also highly significant (all at 1%) across different lags but it is economically insignificant (0.000) for all lags.

PMG estimator yields statistically significant long-run coefficient estimates of political risk rating for lag orders 1, 2, 3, 4 and 5 (at 1% for lags 1, 2, 3 and at 5% for lags 4 and 5), but it becomes statistically insignificant for lag 6. The significant coefficient estimates of political risk rating fall into a narrow range (-0.025; -0.037). Financial risk rating coefficient is insignificant for all lag orders except lag 1, for which the magnitude is 0.017 at 10% significance. The significance of financial risk rating component disappears after lag 1 through lags 2 to 6. Economic risk rating coefficient estimates are statistically highly significant for all lag orders, all at 1% and it ranges between -0.084 and -0.106. The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.940; -0.993). The coefficient of the dummy variable is robust to lag; it is almost constant across increasing lag orders (ranges between -0.029 and -0.031). The trend term is also highly significant across different lags, but it is economically insignificant (0.000 for all lags).

Finally, MG estimator yields statistically significant long-run coefficient estimates for political risk rating for lag orders 1, 2, 3, 4 and 5 (at 1% for lags 1, 2, 3, 4 and at 10% for lag 5), but it becomes statistically insignificant for lag 6. The significant coefficient estimates of political risk rating component range from -0.042 to -0.074. Coefficient estimates of financial risk rating component are statistically insignificant for all lag orders. Coefficient of economic risk rating component is statistically highly significant for all lag specifications (all at 1%) and fall into a range (-0.090; -0.120). The speed of adjustment coefficients are all statistically highly significant (all at 1%) for all lag orders and fall into the range (-0.954; -1.067). The coefficient of the dummy variable is statistically highly significant for all lag orders and ranges between -0.038 and -0.045. The trend term is significant across different lag orders, but it is once again economically insignificant (0.000 for all lags).

For all estimation alternatives and lag specifications, the Pesaran's CD test indicates strong cross-sectional dependence of errors. The CD-test statistics ranges from 209.36 to 229.82, all being very large given that the CD-test statistics is standard normally distributed.

To select from among the three estimation alternatives, the Hausman test is used as before. Between MG and PMG the Hausman test suggests PMG for lags 1, 5 and 6; and suggests MG for lags 2, 3 and 4. For lags 1, 5 and 6, the Hausman test statistics are quite close to the rejection region. Therefore MG is selected against PMG to be on the safe side (in relation to the parameter heterogeneity bias). Between MG and DFE, the Hausman test rejects for all lags the null that differences in parameter estimates are not systematic; therefore MG is selected against DFE. Thus the MG estimator is selected overall.

The MG estimator being selected, AIC and BIC criteria are used to select the best model across different lag orders. In this respect, both AIC and BIC suggest ARDL (6, 6, 6, 6), for which the value of the information criterion is smallest. However, this model yields a speed of adjustment coefficient of -1.067, which is smaller than -1[27]; therefore the very next model suggested by the information criterion and that has a speed of adjustment coefficient between 0 and -1 is selected. This model is ARDL (3, 3, 3, 3). For this model, coefficient estimates of political and

[27] In order for the error-correction approach to be appropriate, speed of adjustment coefficient should be between -1 and 0.

economic risk ratings are all negative and statistically highly significant (all at 1%). The estimates for political and economic risk ratings are -0.074 and -0.100, respectively, implying that a one percent increase (all other being constant) in political and economic ratings are associated with 0.888 and 1.20 percentage points decrease, respectively, in annual stock returns.

The selected model ARDL (3, 3, 3, 3) gives a statistically highly significant (at 1%) speed of adjustment coefficient of -0.984. This coefficient implies that any deviation from equilibrium is corrected in at most 3 months[28], which is consistent with the selected model ARDL (3, 3, 3, 3).

The coefficient of the dummy variable given by the selected model is -0.040 and it is statistically highly significant at 1%. This implies that, all other factor assumed to be constant, the 2008 global crisis has a significant and negative effect on monthly stock returns; after the 2008 crises, monthly stock market returns decrease on average by 4 basis points, which makes 0.48 percentage points annually.

The problem with the results of this model (ARDL (3, 3, 3, 3)) is that there is strong evidence of cross-sectional error dependence across cross sectional units. Pesaran's CD test yields a large statistics of 217.37, which is statistically highly significant (at 1%). The results of the model, therefore, should be interpreted with this consideration.

4.6.2.4.2. CS-ARDL Approach

To solve the cross-sectional error dependence problem, the CS-ARDL approach is used first. Table-C16 shows the results. As discussed earlier, the ARDL approach has a relatively long time dimension requirement, which becomes even longer for higher lag orders in the case of CS-ARDL when the cross-sectional averages are also included in the specification. Indeed, we were unable to obtain

[28] With this speed of adjustment rate, 98.4% of any remaining disequilibrium is corrected each month. Therefore, cumulative correction rates will be 98.4% in the first month, 99.97% in the second month and 100% in the third month.

coefficient estimates from the CS-ARDL specification for lag orders larger than 2 along with the truncation lag order of 3[29].

The results in Table-C16 show that coefficient estimates are not robust to different estimation methods and increasing lag specifications. PMG finds that political, financial and economic risk rating coefficients (-0.021, 0.017 and -0.063, respectively) are statistically significant (at 10%, 5% and 1%, respectively) for lag 1. For lag 2, political and economic risk rating coefficient estimates (-0.055 and -0.022, respectively) are still significant (at 1% and 5%, respectively) but financial risk rating coefficient estimate becomes insignificant.

Similarly, MG estimator yields significant estimates of political and economic risk ratings for lag 1 (-0.039 at 10% and -0.069 at 1%, respectively), but for lag 2, only political risk rating component has a significant coefficient (-0.097 at 1%). Speed of adjustment coefficients are statistically significant for all lag orders and estimation alternatives. However, they are smaller than -1 for both PMG and MG in the case of 2 lags. Therefore this lag specification is eliminated. It remains only the models for 1 lag, among which PMG is suggested by the Hausman test. This model gives statistically significant coefficients for political and economic risk ratings (-0.039 at 10% significance and -0.069 at 1% significance, respectively). Financial risk coefficient is insignificant in this model. The speed of adjustment coefficient for the model is -0.864, which is highly significant (at 1%) and has the expected sign. The coefficient for the dummy variable is also statistically significant at 1%; its magnitude is -0.025. The coefficient of the trend term is significant as well but it is economically insignificant (its value is 0.000).

The CD-test statistics show that there is still significant cross-sectional dependence of errors although the magnitude of this statistics decreased substantially (to -8.23) as compared to the classical ARDL results (where the CD-test statistics were in the order of 220).The presence of cross-sectional error dependence calls for caution in interpreting these results.

[29] Since the longest time dimension in the panel is 358, the maximum truncation lag order [$T^{1/3}$] should be 7. However, the system could not be solved for 7 lags; thus lower lag values were tried in turn. 3 lags was the maximum, for which the sistem could be solved.

4.6.2.4.3. CS-DL Approach

To eliminate the cross-sectional dependence of errors, CS-DL approach is used as a second alternative. Table-8 shows the results. Since the maximum length of the time dimension is 358 for the developed countries sample, p_x is set equal to 7, which is the integer part of $T^{1/3}$. Coefficient estimates for different lag orders (1 to 7) are also obtained and shown in Table-8.

Table-8 presents clear evidence that political and economic risk rating components are significantly related in the long-run with stock market returns. For all lag specifications 1 to 7, political risk rating coefficient estimates are highly significant (all at 1%). The sign of this coefficient is negative as expected for all lags and its magnitude falls into the range (-0.070; -0.103) across lags 1 to 7. However, this range gets narrower starting from lag 3 and the coefficient estimates seem to converge to a value approximately between -0.095 and -0.100. This is consistent with the findings of the classical ARDL approach, in which the speed of adjustment coefficient found by the selected model ARDL (3, 3, 3, 3) implied that the systems gets back to equilibrium in three months, once shocked. Therefore, the long-run coefficient of political risk rating is taken as the average of values corresponding to lags 3 to 7, which turns out to be -0.096. This implies that a one percent increase in political risk rating is associated with 9.6 basis points decrease in monthly stock returns, which makes 1.152 percentage points annually.

Table-8 also provides evidence of a long-run relation between economic risk rating and stock market returns for this sample: Long-run coefficient estimates of economic risk rating are all negative as expected and statistically significant for all lag specifications (at 5% for lags 1, 2, 4, 5, 6; at 1% for lag 3; and at 10% for lag 7). They fall into the range (-0.031; -0.053); however, this range becomes considerably narrower starting from lag 3, and estimates seem to converge to a value approximately around -0.050. Therefore, the long-run coefficient estimate for the economic risk rating is taken as the average of estimates for lags 3 to 7, which turns out to be -0.047. This implies that a one percent increase in economic risk rating is associated with 4.7 basis points decrease in monthly stock returns, which makes 0.564 percentage points annually.

Coefficient estimates of financial risk rating are insignificant for all lag specifications. They are positive for lags 1, 2 and 3; but they are close to zero and they become negative after lag 4, get larger (in absolute value) for longer lags.

I also test for joint equality of the coefficients of the political, economic and financial risk ratings. Parameter equality tests for all lag orders reject the null hypothesis that they are all equal to each other.

The coefficient of the dummy variable is insignificant for all lag orders, which is somewhat expected because the model includes cross sectional averages and their lags, which are supposed to account for at least a considerable part of unobserved common factors and spillover effects.

The trend term estimates are significant for all lags (at 5% for lags 1, 2, 3, 4, 6; at 10% for lags 5 and 7); but they are all economically insignificant (0.000).

Similar to the results in the other samples, the problem with the results in Table-8 is that there is still significant evidence of cross-sectional error dependence for all lag specifications. Although there is substantial decrease as compared to the classical ARDL results (CD test statistics were around 220 in the classical ARDL), the CD-statistics are still significant (the lowest value in absolute terms is 6.93). Therefore, as usual, the results should be interpreted with this consideration.

This model is the best we can offer. Given that it covers the full sample (albeit restricted to a certain extent to be able to calculate CD test statistics) and immune to many of the specification issues that other alternatives are subject to, the results of this approach is taken as the basis for the empirical model that this study fundamentally aims to propose. The shortcoming of this model is that there still remains some cross-sectional dependence of errors, solution of which could be the subject of further research.

Table 8: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	CS-DL (p=1, p_x=7)	CS-DL (p=2, p_x=7)	CS-DL (p=3, p_x=7)	CS-DL (p=4, p_x=7)	CS-DL (p=5, p_x=7)	CS-DL (p=6, p_x=7)	CS-DL (p=7, p_x=7)
θ_{lnP}	**-0.070*** (0.000)**	**-0.084*** (0.000)**	**-0.093*** (0.000)**	**-0.094*** (0.000)**	**-0.093*** (0.000)**	**-0.098*** (0.000)**	**-0.103*** (0.000)**
θ_{lnF}	0.009 (0.705)	0.008 (0.735)	0.006 (0.820)	-0.007 (0.804)	-0.018 (0.511)	-0.022 (0.485)	-0.026 (0.412)
θ_{lnE}	**-0.031** (0.047)**	**-0.039** (0.013)**	**-0.044*** (0.005)**	**-0.046** (0.012)**	**-0.048** (0.014)**	**-0.053** (0.031)**	**-0.045* (0.082)**
γ	-0.004 (0.233)	-0.004 (0.222)	-0.004 (0.235)	-0.003 (0.340)	-0.004 (0.243)	-0.004 (0.256)	-0.004 (0.216)
η	**0.000** (0.039)**	**0.000** (0.032)**	**0.000** (0.037)**	**0.000** (0.043)**	**0.000* (0.059)**	**0.000** (0.046)**	**0.000* (0.075)**
CD test statistics	**-7.93*** (0.000)**	**-7.96*** (0.000)**	**-7.84*** (0.000)**	**-7.65*** (0.000)**	**-7.48*** (0.000)**	**-7.07*** (0.000)**	**-6.93*** (0.000)**
Parameter Equality Test	**6.20** (0.045)**	**8.38** (0.015)**	**8.31** (0.016)**	**6.43** (0.040)**	**4.81* (0.091)**	**4.67* (0.097)**	**5.93* (0.052)**
Observations	15185	15185	15185	15185	15185	15185	15185

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where y_{it} is the natural logarithm of Morgan Stanley Capital International's (MSCI) country stock market US Dollar price index, $\boldsymbol{x}_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} is the natural logarithm of Political Risk Rating, lnF_{it} is the natural logarithm of Financial Risk Rating, lnE_{it} is the natural logarithm of Economic Risk Rating provided by International Country Risk Guide(ICRG), *Dummy* is a dummy variable marking the beginning of the 2008 global financial crisis on December 2007, T is a linear trend term and $p=1,2,3,\ldots 7$; $p_y=0$; $p_x=7$. Symbols ***, ** and * denote significance at 1%, 5% and 10% respectively. Numbers in parenthesis are p-values.

4.6.3. Comparison of the Relation Before and After the 2008 Crisis[30]

The analysis in Section 4.6.1 and 4.6.2 show that the 2008 global crisis has a significant impact on stock market returns. The coefficient estimates of the dummy variable that marks the beginning of the 2008 crisis were always statistically highly significant in the classical ARDL approach for all samples and lag specifications. For the composite risk rating-stock returns relation, the 2008 financial crisis has a negative effect of 2.9 basis points on monthly stock returns (0.35 percentage points annually). For the developed, emerging and frontier country sub-samples, this rate is 2.1 basis points, 3 basis points and 3.3 basis points, respectively. For the disaggregated risk rating-stock returns relation, the 2008 financial crisis has a negative effect of 4 basis points on monthly stock returns (0.48 percentage points annually). For the developed, emerging and frontier country sub-samples, this rate is 3.7 basis points, 3.5 basis points and 3.6 basis points, respectively. In general, the coefficient of the dummy variable becomes insignificant in CS-ARDL and CS-DL approaches, since they already account for unobserved common factors and spillover effects by augmenting the classical ARDL approach with the cross-sectional averages of regressors, dependent variable and their lags.

Given the evidence provided by the classical ARDL approach about the effect of 2008 crisis on stock market returns, it is an empirical issue to see whether this impact leads to a structural change in the risk rating-stock returns relation. To investigate this possibility, the analysis done in Section 4.6.2 (the disaggregated risk rating-stock return relation) is repeated for the before- and after-the-crisis periods. For each sub-sample (developed countries, emerging countries, frontier countries and full samples), classical ARDL, CS-ARDL and CS-DL approaches are repeated for both before- and after-crisis periods and the results are compared in the next sections. The result tables of this analysis are provided in Appendix-D.

[30] I am grateful to Assoc.Prof. Dr. Erk Hacihasanoğlu for raising this important issue.

4.6.3.1. Developed Countries

Tables D1 through D6 present the results of classical ARDL, CS-ARDL and CS-DL approaches for the period before and after the 2008 global crisis for the developed countries sample (Tables D1 to D3 refer to the before-crisis period; Tables D4 to D6 are for the after-crisis period). CS-ARDL results shown in Table-D1 and Table-D4 clearly indicate that political risk rating has a negative significant relation with stock market returns before the crisis (especially in PMG and MG estimates for lags 1,2,3,4), but the relation disappears after the crisis; it even becomes significantly positive and large in magnitude (in the range 0.200-0.272) in PMG estimates for lags 4,5,6. This can be interpreted as follows: if the crisis caused higher drops of stock markets in politically risky countries as compared to relatively less risky countries among developed nations, this might be reflected by a positive coefficient estimate of political risk rating after the crisis.

On the other hand, while the coefficient estimates of financial risk rating before the crisis are statistically insignificant for all estimation alternatives and lag specifications, it becomes significant after the crisis in all estimation methods for lags 2 to 6 (except lag 5 MG estimation). Thus, financial risk becomes significant in stock returns after the crisis. In addition, coefficient estimates of economic risk rating become highly significant after the crisis for all estimation alternatives and lag specifications. Before the crisis, it is significant only in the PMG estimation for lags 3, 4, 5, 6 and insignificant for all other alternatives and lags. After the crisis it becomes highly significant. In summary, stock markets in developed countries become sensitive to financial and economic risks after the crisis. Before the crisis, developed stock markets show sensitivity mainly to political risk, according to the classical ARDL results.

As far as the CS-ARDL approach estimates are concerned, the picture is less clear. Comparative CS-ARDL results are shown in Table-D2 and Table-D5. As discussed before, the relatively long time dimension requirement of the ARDL approach becomes even longer for higher lag orders in the case of CS-ARDL when the cross-sectional averages are also included in the specification. Therefore, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2. This makes it relatively difficult to draw conclusions about the robustness of coefficients to lag orders, as compared to classical ARDL and CS-DL approaches. With the information at hand, however, the following can be commented: For both before and after-crisis analysis, PMG and MG estimates of the CS-ARDL approach yield speed of adjustment coefficients smaller than -1 for lag 2, therefore only lag 1 results are considered.

Taking the lag as 1, the Hausman test suggests PMG estimator for both before and after-crisis analysis. In this framework, before the crisis, PMG estimator yields significant coefficients for political and economic risk ratings. After the crisis, however, political risk rating coefficient estimate becomes insignificant, which is consistent with the results of the classical ARDL approach. However, financial risk is insignificant and economic risk is significant for both before and after-crisis periods, which is different than what classical ARDL suggested. These results implies that, after the 2008 crisis political risk rating lost its significance in relation to stock market returns; but financial and economic risk ratings preserve their importance before and after the crisis.

Finally, we compare before and after-crisis relation in developed countries based on CS-DL approach (Table-D3 and Table-D6). Before the crisis, there is evidence that financial and economic risk ratings have bearings (negative relation as expected) on stock market returns, but this relation disappears after the crisis. The CS-DL results for the after-crisis period show that none of the disaggregated risk rating components have statistically significant coefficient for any lag order.

4.6.3.2. Emerging Countries

Tables D7 through D12 present the results of classical ARDL, CS-ARDL and CS-DL approaches for the period before and after the 2008 global crisis for the emerging countries sample (Tables D7 to D9 refer to the before-crisis period; Tables D10 to D12 are for the after-crisis period). CS-ARDL results shown in Table-D7 and Table-D10 clearly indicate that, similar to the developed countries sample, political risk rating has a negative significant relation with stock market returns before the crisis (in PMG and MG estimates for all lag specifications), but this relation changes sign and becomes a significantly positive relation after the crisis in lag 1,2,3,4,5 DFE estimations (with a range 0.142-0.156), in lag 1,2,3 PMG estimations (with a range 0.231-0.269) and in lag 1 MG estimation (0.259). This can be interpreted with a justification similar to the developed countries sample: if the crisis caused higher drops of stock markets in politically risky countries as compared to relatively less risky countries among emerging countries, this might be reflected by a positive coefficient estimate of political risk rating after the crisis.

On the other hand, the coefficient estimates of financial risk rating before the crisis are statistically significant for lags 2,3,5,6 PMG (with a range 0.038-0.047 at 5% and 10% significance) and lags 2,3 DFE (0.028 and 0.031 at 10% significance). After the crisis, lag 1 and lag 6 PMG yield positive and significant estimates that are larger in magnitude (0.125 and 0.109, respectively, at 5% and 10% significance). Lag 3 DFE yields a negative and significant estimate (-0.108 at 5%), but all other estimates are insignificant. Overall, these results indicate that there is some (but not strong) evidence of positive relation between financial risk rating and stock market returns, and the magnitude of this relation gets larger after the crisis. As discussed in the previous section, a similar argument can be developed: if the crisis caused higher drops of stock markets in financially risky countries as compared to relatively less risky countries among emerging countries, this might be reflected by a positive coefficient estimate of financial risk rating after the crisis.

As for the economic risk rating, there is a clear picture: before the crisis there is almost no evidence of a relation between economic risk rating and stock returns, but after the crisis there is clear negative evidence. Except for lag 3, 4, 5 MG estimates, all estimation alternatives and lag specifications yield statistically highly significant negative coefficients for economic risk rating. The range of coefficients for DFE is (-0.148, -0.213), for PMG is (-0.219, -0.256) and for MG is (-0.132, -0.221). This implies that economic risk becomes important after the crisis in the developing countries sample.

As far as the CS-ARDL approach estimates are concerned, the picture is once again less clear. Comparative CS-ARDL results are shown in Table-D8 and Table-D11. As discussed before, we were unable to obtain coefficient estimates from the CS-ARDL specification for lag orders larger than 2. This makes it relatively difficult to draw conclusions about the robustness of coefficients to lag orders, as compared to classical ARDL and CS-DL approaches. With the information at hand, however, the following can be commented: For both before and after-crisis analysis, PMG and MG estimates of the CS-ARDL approach yield speed of adjustment coefficients smaller than -1 for lag 2, therefore only lag 1 results are considered.

Taking the lag as 1, the Hausman test suggests PMG estimator for both before and after-crisis analysis. In this framework, before the crisis, PMG estimator yields a significant negative coefficient for political risk rating. Coefficients of financial and economic risk ratings are insignificant. After the crisis, however, political risk rating coefficient estimate becomes insignificant, but financial and economic risk rating coefficients become significant (0.214 at 1% and -0.069 at 5% significance, respectively), albeit the former being positive. The usual interpretation is in order: if the crisis may cause higher drops of stock markets in financially risky countries as compared to relatively less risky countries among emerging countries, this might be reflected by a positive coefficient estimate of financial risk rating after the crisis.

Finally, we compare before and after-crisis relation in emerging countries based on CS-DL approach (Table-D9 and Table-D12). Before the crisis, there is clear evidence that political risk rating has bearings (negative relation as expected) on stock market returns. For all lag specifications, political risk rating coefficients are statistically significant. However, this relation disappears after the crisis. The CS-DL results for the after-crisis period show that none of the disaggregated risk rating components have statistically significant coefficient for any lag order.

4.6.3.3. Frontier Countries

Tables D13 through D18 present the results of classical ARDL, CS-ARDL and CS-DL approaches for the period before and after the 2008 global crisis for the frontier countries sample (Tables D13 to D15 refer to the before-crisis period; Tables D16 to D18 refer to the after-crisis period). As can be seen from the Tables, some of the estimation results cannot be obtained because of the fact that the frontier countries sample is highly unbalanced. For the classical ARDL approach, PMG and MG estimations for lags greater than 2 could not be obtained for the before-crisis period. For the after-crisis period (which is even shorter than the before-crisis period) none of the PMG and MG estimations could be obtained. Therefore, classical ARDL results will be interpreted based on only DFE estimates.

In this framework, Table-D13 and Table-D16 show that political and economic risk ratings have significant bearings on stock market returns (they both have a negative relation with returns) before the crisis, but after the crisis political risk loses its significance and only economic risk remains as a significant factor. Moreover its magnitude gets larger in absolute value (before the crisis the average of significant coefficients is -0.070, and after the crisis it is -0.109). Thus the sensitivity of stock market returns to economic risk increases in frontier countries sample after the 2008 crisis. Financial risk coefficient is significant for only lags 1 (at 1%) and 6 (at 10%), but it is counterintuitively positive before the crisis. It is insignificant for all lag specifications after the crisis.

CS-ARDL estimations could not be obtained for the before and after-crisis periods as the frontier countries sample is highly balanced. Thus we continue with comparing the before and after-crisis relation in frontier countries based on CS-DL approach (Table-D15 and Table-D18). Before and after the crisis, there is no clear and robust evidence that any of the disaggregated risk rating components have a long-run relation with stock market returns.

4.6.3.4. Full Sample

Tables D19 through D24 present the results of classical ARDL, CS-ARDL and CS-DL approaches for the periods before and after the 2008 global crisis for the full sample (Tables D19 to D21 refer to the before-crisis period; Tables D22 to D25 refer to the after-crisis period). In Table-D22, only DFE estimation results are presented[31] and comparisons will be made based on this estimation method for the after-crisis period. CS-ARDL results shown in Table-D19 and Table-D22 indicate that political risk rating has a negative significant relation with stock market returns before the crisis for all estimation alternatives and lag specifications (except for lag 5

[31] PMG and MG estimations could not be computed by STATA due to “infeasible initial values”.

and 6 MG estimates), but the relation changes sign after the crisis; it becomes significantly positive (for lags 2, 3, 5, 6; magnitudes in the range 0.091-0.097). The usual interpretation follows: if the crisis caused higher drops of stock markets in politically risky countries as compared to relatively less risky countries, this might be reflected by a positive coefficient estimate of political risk rating after the crisis.

On the other hand, the DFE coefficient estimates of financial risk rating before the crisis are statistically significant and positive for all estimation alternatives and lag specifications. DFE's positive estimation of coefficients is counterintutitive; however, the estimation method suggested by the Hausman test (PMG)[32] yields insignificant coefficient estimates for financial risk rating. PMG shows clear evidence that political and economic risk rating components are significant in the long-run relation with stock market returns before the crisis. After the crisis, in addition to the political risk rating mentioned above, economic risk rating continues to be a significant factor but its magnitude increases and financial risk rating components becomes significant. In summary, before the crisis, political and economic risk rating components have negative significant relation between stock market returns; after the crisis, the political risk-return relation becomes positive, financial risk rating-return relation becomes significant and economic risk rating-return relation continues to be negative but its magnitude increases. It seems that after the crisis, financial and economic risk become relatively important and dramatic stock market drops in politically more risky countries generates a positive relation between risk and return. These results are interesting, but should be interpreted with caution; because the cross-sectional error dependence tests statistics inTable-D19 indicate strong cross-sectional dependence of errors, which might lead to misleding results.

As for the CS-ARDL approach for the before-crisis period[33], the Hausman test suggests PMG against MG for all lag specifcations (Table-D20). This method

[32] The Hausman test between MG and PMG suggests PMG for all lag specifications. The Hausman test between MG and DFE suggests MG for lags 2 and 3, and suggests DFE for lags 1,4,5,6. However, for lags 1,4,5 and 6, the test statistics is closer to the rejection region as compared to the test statistics between MG and PMG, therefore PMG is selected as the overall reference estimation method.

[33] CS-ARDL results (Table-D23) for the after-crisis period could not be computed by STATA due to "infeasible initial values".

suggests that political and financial risk rating components have significant bearings on stock market returns. Financial risk rating component, on the other hand, turns out to be insignificant.

Finally, we compare before and after-crisis relation in the full sample based on CS-DL approach (Table-D21 and Table-D24). Before the crisis, there is clear evidence that political and economic risk ratings have bearings (negative relation as expected) on stock market returns, but this relation disappears after the crisis. Financial risk rating becomes significant after the crisis, but its coefficient is positive and large in magnitude (0.242, 0.230 and 0.299 for lags 1, 2, and 3, respectively) meaning that higher financial risk is associated with lower return. This could be due the possibility that dramatic stock market drops after the crisis in financially more risky countries may have generated a positive coefficient.

The CD test of Pesaran in Tables D21 and D24 show that there is still some significant degree of cross-sectional error dependence. Although the statistics have dropped dramatically as compared to the classical ARDL approach, they are still statistically significant, therefore the results shown in Tables-D21 and D24 should be interpreted with this consideration. However, this is the best we have been able to reach, given the extant empirical methods.

CHAPTER 5

THE PROPOSED MODEL

The empirical model of the international cost of equity proposed in this study is based on the cross-sectionally augmented distributed lag (CS-DL) approach applied to the full sample. The reason for selecting this approach is that it is robust to many of the problems that other approaches (classical ARDL and CS-ARDL) have. The advantages of this approach are explained in more detail in Section 3.3.2. While the CS-ARDL and CS-DL methods are complementary rather than alternatives to each other, the CS-DL approach fits better to the conditions of the data and variables used in this study. The long time dimension requirement of the ARDL approach becomes even longer in the CS-ARDL method, when the cross sectional averages are added to the specification. When cross-sectional averages and lags of the three independent variables (political, financial and economic risk ratings) and of the dependent variable are added to the specification, obtaining coefficient estimates becomes even more difficult. Indeed, CS-ARDL approach was not able to obtain coefficient estimates for lags greater than two and this limited our ability to examine the robustness of coefficients to higher lag orders. The CS-DL approach, on the other hand, computes the long-run coefficients directly without calculating the short-run coefficients first; therefore it can accommodate longer lag orders and was able to calculate long-run coefficient estimates for lag orders as long as 7 months. This enabled us to examine the robustness of the estimates to increasing lag orders, observe the pattern that coefficient estimates follow when higher lag orders are imposed and judge whether estimates converge.

The CS-DL-MG approach being selected as the basis for the proposed model, we found in Section 4.6.2.4.3 that a one percent permanent increase in political risk rating is associated with 9.6 basis points decrease in monthly stock returns across countries, which makes 1.152 percentage points annually. In addition, a one percent permanent increase in economic risk rating is associated with 4.7 basis points decrease in monthly stock returns across countries, which makes 0.564 percentage points annually. Therefore, the long-run[34] relation between stock market returns and disaggregated risk ratings can be expressed as follows:

$$R_{it}=a_t-1.152\ln P_{it}-0.564\ln E_{it}+\mu_i+\varepsilon_{it}$$

Taking expectations of both sides;

$$E(R_{it})=E[a_t-1.152\ln P_{it}-0.564\ln E_{it}+\mu_i+\varepsilon_{it}]$$

Since a_t is a constant $E(a_t)=a_t$

And by construction $E(\mu_i)=E(\varepsilon_{it})=0$, then

$$E(R_{it})=a_t-1.152\ln \overline{P_{it}}-0.564\ln \overline{E_{it}}$$

where $E(R_{it})$ is the expected return, $\overline{P_{it}}$ is the average political risk rating of country i, $\overline{E_{it}}$ is the average economic risk rating of country i. This expression can be used to develop an empirical model that calculates the international cost of equity (and expected returns) relative to a certain benchmark.

To do this, consider two countries with different political and economic risk ratings. Assume that in one of these countries we are able to (in some way) calculate the cost of equity for an average risk investment, and we are interested in calculating the cost of equity in the other country. Assume also that the ratings of these countries did not change for the last 3 months[35]. Then, in the long-run;

$$E(R_{it})=a_t-1.152\ln \overline{P_{it}}-0.564\ln \overline{E_{it}}$$

[34] The "long-run" is 3 months in this model. This comes from the fact that the CS-DL approach (as well as the ARDL approach) on which the empirical model is based indicated that the long-run equilibrium is reached in about 3 months.

[35] This assumption is critical, because the coefficient estimates reflect the "long-run" equilibrium relation between risk ratings and stock market returns. Thus, in order for this model to work, one should assume that the system is in the long-run equilibrium.

Since we assume that the system is in long-run equilibrium (risk ratings do not change for at least three months) $\overline{P_{it}} = P_{it}$ and $\overline{E_{it}} = E_{it}$, then,

$$E(R_{it})=a_t-1.152ln\ P_{it}\ -0.564ln\ E_{it}$$

where, $E(R_{it})$ is the expected annual equity return in country i, P_{it} is the political risk rating of country i at time t and E_{it} is the economic risk rating of country i at time t. For country j,

$$E(R_{jt})=a_t-1.152ln\ P_{jt}\ -0.564ln\ E_{jt}$$

where, $E(R_{jt})$ is the expected annual equity return in country j, P_{jt} is the political risk rating of country j at time t and E_{jt} is the economic risk rating of country j at time t. Assume also that R_j is unknown. Taking the difference between $E(R_j)$ and $E(R_i)$;

$$E(R_{jt})\ -\ E(R_{it}) = a_t-1.152ln\ P_{jt}\ -0.564ln\ E_{jt} -(\ a_t-1.152ln\ P_{it}\ -0.564ln\ E_{it}\ )$$

Then,

$$E(R_{jt})\ -\ E(R_{it})=1.152ln(\frac{P_{it}}{P_{jt}})+\ 0.564ln\ (\frac{E_{it}}{E_{jt}})$$

If we call country i as the benchmark country for which $E(R_i)$ is known or can be calculated, then;

$$E(R_{jt})\ -E(R_{Bt})=1.152ln(\frac{P_{Bt}}{P_{jt}})+\ 0.564ln\ (\frac{E_{Bt}}{E_{jt}})$$

and

$$E(R_{jt}) = E(R_{Bt}) + 1.152 ln(\frac{P_{Bt}}{P_{jt}}) + 0.564 ln(\frac{E_{Bt}}{E_{jt}}) \quad (18)$$

If the benchmark country is taken as the US, where the CAPM is known to work relatively better; then $E(R_{Bt})$ can be estimated using CAPM. Then,

$$E(R_{jt}) = E(R_{USt}) + 1.152 ln(\frac{P_{USt}}{P_{jt}}) + 0.564 ln(\frac{E_{USt}}{E_{jt}}) \quad (19)$$

and,

$$E(R_{USt}) = r_{fUSt} + \beta(R_{MUSt} - r_{fUSt}) \quad (20)$$

where, $E(R_{jt})$ is the expected annual equity return in country j, $E(R_{USt})$is the expected annual equity return in the US, P_{USt} is the political risk rating of the US at time t, E_{jt} is the economic risk rating of country j at time t, r_{fUSt} is the risk free rate in the US at time t, R_{MUSt} is the market return in the US at time t and β is the beta of the project in question.

To give an example, consider the US and Turkey. As discussed before, in order for the model to work, one should find a particular month up to which the political and economic risk ratings in both of the compared countries stayed constant for at east three months (the system should be in the "long-run" equilibrium in both countries). One such month is October 2012. For this month, political and economic risk ratings of the US were 83.5 and 36.5, respectively. Those of Turkey were 56.5 and 33, respectively. Usign the proposed model given above;

$$E(R_{TRt}) = E(R_{USt}) + 1.152 ln(\frac{P_{USt}}{P_{TRt}}) + 0.564 ln(\frac{E_{USt}}{E_{TRt}})$$

$$E(R_{TR}) = E(R_{US}) + 1.152 ln(\frac{83.5}{56.5}) + 0.564 ln(\frac{36.5}{33})$$

$E(R_{TR}) = E(R_{US})+50.7\%$

Thus, according to this model, the cost of equity is 50.7% higher in Turkey than in the US annually for an average risk long-term direct capital investment. As suggested before, $E(R_{US})$ can be calculated using CAPM to obtain an absolute, rather than a relative value of the cost of equity in Turkey. This model can be used to calculate the cost of equity in any country of known political and economic risk ratings[36].

Similar empirical models can also be formulated for the developed and emerging country samples by using the coefficient estimates obtained for the respective country sub-samples[37]. In that case, however, one should be careful, as the empirical model for a specific sub-sample should be used to calculate the international cost of equity relative to a country that is in the same group.

Thus, following a similar derivation method as for the full sample, the model for the developed countries sample would be;

$$E(R_{jt}) = E(R_{USt})+0.732ln(\frac{P_{USt}}{P_{jt}})+0.936ln\,(\frac{E_{USt}}{E_{jt}}) \qquad (21)$$

and,

$$E(R_{USt})=r_{fUSt} + \beta(R_{MUSt}-r_{fUSt}) \qquad (22)$$

where, $E(R_{jt})$ is the expected annual equity return in country j, $E(R_{USt})$is the expected annual equity return in the US, P_{USt} is the political risk rating of the US at time t, E_{jt} is the economic risk rating of country j at time t, r_{fUSt} is the risk free rate in the US at time t, R_{MUSt} is the market return in the US at time t and β is the beta of the project in question.

For the emerging country sample the model would be;

[36] One should be careful when using this model for a frontier country, bacause while the full sample includes 6 frontier countries, the long-run coefficient estimates are not statistically significant for the frontier countries sample per se.

[37] This is not valid for the frontier countries sample. See footnote 35.

$$E(R_{jt}) = E(R_{Bt})+1.042ln(\frac{P_{Bt}}{P_{jt}}) \tag{23}$$

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt}) \tag{24}$$

where, $E(R_{jt})$ is the expected annual equity return in country j, $E(R_{Bt})$is the expected annual equity return in the benchmark country, P_{Bt} is the political risk rating of the benchmark country at time t, E_{jt} is the economic risk rating of country j at time t, r_{fBt} is the risk free rate in the benchmark country at time t, R_{MBt} is the market return in the benchmark country at time t and β is the beta of the project in question.

If the model is constructed using composite risk ratings;

For the full sample,

$$E(R_{jt}) = E(R_{Bt})+1.284ln(\frac{C_{Bt}}{C_{jt}}) \tag{25}$$

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt}) \tag{26}$$

For the developed country sample,

$$E(R_{jt}) = E(R_{Bt})+1.152ln(\frac{C_{Bt}}{C_{jt}}) \tag{27}$$

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt}) \tag{28}$$

For the emerging markets sample,

$$E(R_{jt}) = E(R_{Bt})+1.356ln(\frac{C_{Bt}}{C_{jt}}) \tag{29}$$

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt}) \tag{30}$$

where, $E(R_{jt})$ is the expected annual equity return in country j, $E(R_{Bt})$is the expected annual equity return in the benchmark country, C_{Bt} is the composite risk rating of the benchmark country at time t, C_{jt} is the composite risk rating of country j at time t, r_{fBt} is the risk free rate in the benchmark country at time t, R_{MBt} is the market return in the benchmark country at time t and β is the beta of the project in question.

It should be noted that the models for the emerging markets has a limitation, which stems from the difficulty of obtaining $E(R_{Bt})$ by using the CAPM. In emerging countries, many of the fundamental assumptions of standard asset pricing models tend to be violated and this increases the probability that they will fail when applied to emerging markets (Harvey, 2001). Therefore, using CAPM to find $E(R_{Bt})$ is questionable. The model, however, can provide a measure of the cost of equity difference between two emerging markets.

Another word of caution is about the composite rating models: The composite risk rating of the ICRG includes three sub-components, political, financial and economic. The composite rating-stock returns relation provides a "lump-sum" value of the long-run coefficient, which can be considered as the overall collective effect of the changes in sub-components to stock returns. However, the disaggregated analysis shows that only political and economic risk ratings are significantly related to stock market returns in the long-run and financial risk rating is not significantly related. Moreover, since the variation of political risk ratings across countries is much greater than the variation of the composite risk rating, the disaggregated model suggests much higher cost of equity differences than the composite rating model. To show this, consider the estimations of the cost of equity for Turkey by the full sample models of disaggregated and composite risk rating cases.

The composite rating model is;

$$E(R_{jt}) = E(R_{Bt}) + 1.284 \ln\left(\frac{C_{Bt}}{C_{jt}}\right)$$

The disaggregated rating model is;

$$E(R_{jt}) = E(R_{bt}) + 1.152 \ln\left(\frac{P_{bt}}{P_{jt}}\right) + 0.564 \ln\left(\frac{E_{bt}}{E_{jt}}\right)$$

If the benchmark country is taken as the US and composite risk ratings are taken as the October 2013 values[38], the composite model estimates would be;

$$E(R_{TRt}) = E(R_{USt})+1.284ln(\frac{75.50}{62.25})$$

$$E(R_{TRt}) = E(R_{USt})+24.8\%$$

On the other hand, the diaggregated model would suggest;

$$E(R_{TRt}) = E(R_{USt})+1.152ln(\frac{80}{54})+ 0.564ln (\frac{38.5}{35})$$

$$E(R_{TRt}) = E(R_{USt})+50.7\%$$

As can be seen, the disaggregated model estimate is much higher than the composite model estimate and, in addition, the composite rating model estimate is relatively closer to Erb, Harvey and Viskanta's (1996) credit rating model (in which Institutional Investor's semi-annual composite risk ratings were used) as compared to the disaggregated model estimates.[39] As discussed before, this could be due to the differences in variations of composite risk and political risk ratings across countries. Since the composite rating is a linear weighted combination of political, financial and economic risk ratings, it might be disguising the variation in its sub-components. The disaggregated model captures the effect of this variation.

[38] I assume that October 2013 values reflect long-run equilibrium.

[39] Comparison of the model results with available alternative models for a sample of countries is given in Appendix-H. Note that cost of equity comparisons are given relative to the cost of equity in the US.

CHAPTER 6

CONCLUSION

6.1. Country Risk Ratings and Stock Market Returns

Given the available theoretical and in particular empirical evidence, this study argues that country risk ratings and country stock market returns should co-move from a long-run perspective and that this relation can provide useful insights in respect of expected equity returns and the cost of equity in international markets. Testing this hypothesis by utilizing relatively rigorous time series techniques and cointegration analyses based on a sample of 51 countries, the study finds statistically significant evidence of a long-run relation between country risk ratings and stock market returns, for both composite and disaggregated risk ratings. The relations are dynamic; the effect of a change in risk ratings lasts for several months after which the long-run equilibrium is reached. In that respect, the term "long-run" in this study refers to 2-5 months, depending on whether composite or disaggregated ratings are used as the independent variables and conditional on the country sample considered.

The study finds that a one percent permanent increase (decrease) in composite risk rating is associated with 9.6, 11.3 and 10.7 basis points decreases (increases) in monthly stock returns in developed, emerging and full sample countries, respectively. There is no significant relation between composite risk ratings and stock market returns in the frontier countries sample. The permanent effect occurs in 3, 4 and 5 months for developed, emerging and full countries samples, respectively.

If the sub-components of composite risk ratings are considered, political and economic risk ratings are significantly and negatively (-6.1 and -7.8 basis points, respectively) related to monthly stock market returns in developed countries. In emerging countries, only political risk is significant and negative in influencing stock market returns (-8.7 basis points). There is no significant relation in frontier countries sample. For the full sample, political and economic risk ratings are significant, negatively affecting monthly stock market returns by -9.6 and -4.7 basis points, respectively. As the relations are dynamic, the permanent effect occurs in 5, 2 and 3 months for developed, emerging and full counties samples, respectively.

Therefore, in the case of the composite rating-stock returns relation, the "long-run" is around 3 months in developed countries, around 4 months in emerging countries and around 5 months for the full sample that includes frontier countries as well. In the case of the disaggregated ratings-stock returns relation, the "long-run" is around 5 months in developed countries, around 2 months in developing countries, and around 3 months for the full sample. Thus, when the long-run equilibrium is shocked in some way, the system reverts back to equilibrium in around 3 months for the composite risk case and in around 5 months for the disaggregated risk ratings case.

There is strong evidence that the 2008 global crisis had significant effects on stock markets for all the samples considered. The crisis caused considerable drops in country stock market index returns in developed, emerging and frontier countries. To investigate whether the 2008 crisis caused a structural change in the risk ratings-stock market return relation, samples are divided into two periods: before and after the crisis.

Before- and after-crisis analysis shows that the relation between risk ratings and stock market returns disappears (for both composite and disaggregated cases) after the 2008 crisis. Before the crisis, the relation is similar to what has been found for the full period. The disappearance of the relation after the crisis, however, could be due to the lack of data, because the length of the after-crisis period is considerably shorter than that of the before-crisis period. This could have impeded detection of a long-run relation. Thus, repeating the after-crisis analysis when long-enough data accumulates could be the subject of further research.

6.2. The Proposed Model of The International Cost of Equity

The statistically significant relation found in this study between country risk ratings and stock market returns can be used to derive an empirical model of the international cost of equity. The long-run coefficients found in the empirical analysis provide the basis for the model. The mean group (MG) estimation of the cross-sectionally augmented distributed lag model (CS-DL) that includes disaggregated risk rating components (political, financial, economic risk ratings) as independent variables and country stock market returns as the dependent variable, yields significant long-run coefficient estimates for political and economic risk rating components. These estimates are used to derive the following empirical model that estimates expected returns for a country of known political and economic risk ratings relative to a benchmark country.

$$E(R_{jt}) = E(R_{Bt})+1.152ln(\frac{P_{Bt}}{P_{jt}})+ 0.564ln\,(\frac{E_{Bt}}{E_{jt}})$$

and,

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt})$$

where, $E(R_{jt})$ is the expected annual equity return in country j, $E(R_{Bt})$is the expected annual equity return in the benchmark country, P_{Bt} is the political risk rating of the the benchmark country at time t, P_{jt} is the political risk rating of country j at time t, E_{USt} is the economic risk rating of the the benchmark country at time t, E_{jt} is the economic risk rating of country j at time t, r_{fBt} is the risk free rate in the the benchmark country at time t, R_{MBt} is the market return in the the benchmark country at time t and β is the beta of the project in question. The benchmark country can be a country where the CAPM is known to work properly. An obvious candidate for this is the US. Thus, the model can calculate the cost of equity in a country of known political and economic risk ratings by adding a "political and economic country risk premium" to the US cost of equity. In the CAPM terminology, the coefficient of the political risk component (1.152, which is also the slope) is the price of "relative political risk" and the coefficient of the economic risk component (0.564, which is also the slope) is the price of "relative economic risk". Then, the terms $ln(P_{Bt}/P_{jt})$ and $ln(E_{Bt}/E_{jt})$ are the quantity of relative political risk and relative economic risk, respectively.

Since country risk ratings provided by the ICRG cover a larger number of countries, the model has broad international applicability. As long as political and economic risk ratings are available[40], the model can provide and estimate of the cost of equity in the country. One should be cautious, however, in using the model to calculate the cost of equity in a frontier country, because the empirical analysis does not provide a statistically significant evidence of a long-run relation between country risk ratings and stock market returns in frontier countries.

[40] As discussed before, in order for the model to work one should assume that political and economic risk rating values used in the model stay constant for at least three months in both of the countries; i.e., the systems are in the long-run equilibrium state.

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APPENDICES

APPENDIX-A: Panel Unit Root Tests

Table A 1: Panel Unit Root Tests-Developed Countries

	Im, Pesaran, Shin*			***Fisher Type Dickey-Fuller****				***Fisher Type Phillips-Pherron****			
	t-bar	***t-tilde-bar***	***Z-t-tilde-bar***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***
dlnMSCIC	-17.062	-12.499	-64.502 (0.000)	1730.095 (0.000)	-39.807 (0.000)	-97.750 (0.000)	171.678 (0.000)	1730.095 (0.000)	-39.809 (0.000)	-97.750 (0.000)	171.678 (0.000)
lnC	-2.161	-2.145	-3.686 (0.000)	84.059 (0.001)	-3.741 (0.000)	-3.666 (0.000)	3.680 (0.000)	84.059 (0.001)	-3.741 (0.000)	-3.666 (0.000)	3.680 (0.000)
lnP	-2.143	-2.127	-3.581 (0.000)	84.536 (0.001)	-3.608 (0.000)	-3.621 (0.000)	3.729 (0.000)	84.536 (0.001)	-3.608 (0.000)	-3.621 (0.000)	3.729 (0.000)
lnF	-1.946	-1.933	-2.441 (0.007)	69.748 (0.022)	-2.377 (0.009)	-2.496 (0.007)	2.220 (0.013)	69.748 (0.022)	-2.377 (0.009)	-2.496 (0.007)	2.220 (0.013)
lnE	-2.768	-2.733	-7.142 (0.000)	151.280 (0.000)	-7.367 (0.000)	-8.037 (0.000)	10.541 (0.000)	151.280 (0.000)	-7.367 (0.000)	-8.0371 (0.000)	10.541 (0.000)

*Ho: All panels contain unit roots; Ha: Some panels are stationary
**Ho: All panels contain unit roots; Ha: At least one panel is stationary
Notes: dlnMSCIC is the first difference of the natural logarithm (namely, return) of country MSCI index, lnC is the natural logarithm of composite risk rating, lnP is the natural logarithm of political risk rating, lnF is the natural logarithm of financial risk rating, lnE is the natural logarithm of economic risk rating, Numbers in paranthesis are p-values

Table A2: Panel Unit Root Tests-Emerging Countries

	Im, Pesaran, Shin*			***Fisher Type Dickey-Fuller****				***Fisher Type Phillips-Pherron****			
	t-bar	***t-tilde-bar***	***Z-t-tilde-bar***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***
dlnMSCIC	-14.997	-11.089	-52.740 (0.000)	1513.833 (0.000)	-37.238 (0.000)	-91.489 (0.000)	160.590 (0.000)	1513.833 (0.000)	-37.238 (0.000)	-91.489 (0.000)	160.590 (0.000)
lnC	-2.504	-2.466	-5.247 (0.000)	115.376 (0.000)	-5.476 (0.000)	-5.977 (0.000)	8.006 (0.000)	115.376 (0.000)	-5.476 (0.000)	-5.977 (0.000)	8.006 (0.000)
lnP	-2.360	-2.330	-4.496 (0.000)	100.628 (0.000)	-4.758 (0.000)	-4.887 (0.000)	6.397 (0.000)	100.628 (0.000)	-4.758 (0.000)	-4.887 (0.000)	6.397 (0.000)
lnF	-2.855	-2.807	-7.125 (0.000)	140.477 (0.000)	-7.391 (0.000)	-8.104 (0.000)	10.745 (0.000)	140.477 (0.000)	-7.391 (0.000)	-8.104 (0.000)	10.745 (0.000)
lnE	-2.919	-2.870	-7.471 (0.000)	147.887 (0.000)	-7.752 (0.000)	-8.519 (0.000)	11.553 (0.000)	147.887 (0.000)	-7.752 (0.000)	-8.519 (0.000)	11.553 (0.000)

*Ho: All panels contain unit roots; Ha: Some panels are stationary

**Ho: All panels contain unit roots; Ha: At least one panel is stationary

Notes: dlnMSCIC is the first difference of the natural logarithm (namely, return) of country MSCI index, lnC is the natural logarithm of composite risk rating, lnP is the natural logarithm of political risk rating, lnF is the natural logarithm of financial risk rating, lnE is the natural logarithm of economic risk rating, Numbers in paranthesis are p-values

Table A3: Panel Unit Root Tests- Frontier Countries

	Im, Pesaran, Shin*			***Fisher Type Dickey-Fuller*****				***Fisher Type Phillips-Pherron*****			
	t-bar	***t-tilde-bar***	***Z-t-tilde-bar***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***
dlnMSCIC	-9.286	-6.964	-36.362 (0.000)	1649.938 (0.000)	-37.808 (0.000)	-83.313 (0.000)	145.141 (0.000)	1649.938 (0.000)	-37.808 (0.000)	-83.312 (0.000)	145.141 (0.000)
lnC	-1.728	-1.702	-1.352 (0.088)	74.839 (0.094)	-1.228 (0.110)	-1.421 (0.079)	1.355 (0.088)	74.839 (0.094)	-1.228 (0.110)	-1.421 (0.079)	1.355 (0.088)
lnP	-1.431	-1.402	0.648 (0.741)	69.744 (0.183)	0.514 (0.696)	0.354 (0.638)	0.890 (0.187)	69.744 (0.183)	0.514 (0.696)	0.354 (0.638)	0.890 (0.187)
lnF	-1.778	-1.751	-1.675 (0.047)	73.164 (0.118)	-1.594 (0.055)	-1.556 (0.061)	1.202 (0.115)	73.164 (0.118)	-1.594 (0.055)	-1.556 (0.061)	1.202 (0.115)
lnE	-2.173	-2.123	-4.149 (0.000)	115.714 (0.000)	-4.174 (0.000)	-4.595 (0.000)	5.086 (0.000)	115.714 (0.000)	-4.174 (0.000)	-4.595 (0.000)	5.086 (0.000)

*Ho: All panels contain unit roots; Ha: Some panels are stationary

**Ho: All panels contain unit roots; Ha: At least one panel is stationary

Notes: dlnMSCIC is the first difference of the natural logarithm (namely, return) of country MSCI index, lnC is the natural logarithm of composite risk rating, lnP is the natural logarithm of political risk rating, lnF is the natural logarithm of financial risk rating, lnE is the natural logarithm of economic risk rating, Numbers in paranthesis are p-values

Table A4: Panel Unit Root Tests-Full Sample

	Im, Pesaran, Shin*			Fisher Type Dickey-Fuller**				Fisher Type Phillips-Pherron**			
	t-bar	***t-tilde-bar***	***Z-t-tilde-bar***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***	***Inverse chi-squared***	***Inverse normal***	***Inverse logit t***	***Modified inv. chi-squared***
dlnMSCIC	-15.941	-11.711	-87.418 (0.000)	3676.453 (0.000)	-58.031 (0.000)	-142.190 (0.000)	250.262 (0.000)	3676.453 (0.000)	-58.031 (0.000)	-142.190 (0.000)	250.262 (0.000)
lnC	-2.361	-2.332	-7.003 (0.000)	235.712 (0.000)	-7.221 (0.000)	-7.633 (0.000)	9.362 (0.000)	235.712 (0.000)	-7.221 (0.000)	-7.633 (0.000)	9.362 (0.000)
lnP	-2.249	-2.224	-6.078 (0.000)	214.459 (0.000)	-6.271 (0.000)	-6.517 (0.000)	7.874 (0.000)	214.459 (0.000)	-6.271 (0.000)	-6.517 (0.000)	7.874 (0.000)
lnF	-2.361	-2.333	-7.007 (0.000)	233.667 (0.000)	-7.152 (0.000)	-7.664 (0.000)	9.219 (0.000)	233.667 (0.000)	-7.152 (0.000)	-7.664 (0.000)	9.219 (0.000)
lnE	-2.890	-2.843	-11.383 (0.000)	355.699 (0.000)	-11.789 (0.000)	-13.108 (0.000)	17.763 (0.000)	355.699 (0.000)	-11.789 (0.000)	-13.108 (0.000)	17.763 (0.000)

*Ho: All panels contain unit roots; Ha: Some panels are stationary

**Ho: All panels contain unit roots; Ha: At least one panel is stationary

Notes: dlnMSCIC is the first difference of the natural logarithm (namely, return) of country MSCI index, lnC is the natural logarithm of composite risk rating, lnP is the natural logarithm of political risk rating, lnF is the natural logarithm of financial risk rating, lnE is the natural logarithm of economic risk rating, Numbers in paranthesis are p-values

APPENDIX-B: Panel Cointegration Tests

Table B1: Panel Cointegration Tests-Full Period

	Composite Risk Rating-Return Relation								Disaggregated Risk Ratings-Return Relation							
	Developed		Emerging		Frontier		Full Sample		Developed		Emerging		Frontier		Full Sample	
	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group
v	46.26	-	36.13	-	12.18	-	59.83	-	31.8	-	25.22		7.85	-	41.51	-
rho	-246.8	-212.8	-178.1	-152.8	-132.5	-76.02	-320.9	-271.4	-165.2	-163.4	-118.7	-116.6	-88.26	-56.17	-214.8	-207.7
t	-90.25	-96.47	-72.54	-77.49	-55.3	-51.64	-122	-130	-85.1	-93.79	-68.29	-75.29	-51.99	-49.94	-115.2	-126.4
adf	-78.61	-80.09	-58.5	-56.78	-43.59	-40.05	-103.1	-102.7	-74.09	-77.75	-53.7	-53.99	-43.21	-39.77	-97.25	-99.9

Note: All test statistics are distributed N(0,1), under a null of no cointegration and diverge to negative infinity (save for panel v).

Table B2: Panel Cointegration Tests-Comparison of the Relation Before and After the 2008 Crisis

	Disaggregated Risk Ratings-Return Relation															
	Before the Crisis								After the Crisis							
	Developed		Emerging		Frontier		Full Sample		Developed		Emerging		Frontier*		Full Sample**	
	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group	Panel	Group
v	22.67	-	17.23		1.664		29.29		4.746	-	5.29		N/A	N/A	N/A	N/A
rho	-130.2	-128.2	-85.51	-81.21	-74.18	-30.01	-166.4	-155.9	-25.72	-24.16	-25.57	-24.07	N/A	N/A	N/A	N/A
t	-78.78	-86.86	-58.44	-63.82	-41.72	-32.53	-103.9	-112.7	-28.7	-30.81	-28.96	-31.28	N/A	N/A	N/A	N/A
adf	-63.16	-63.16	-40.4	-39.36	-37.47	-26.62	-81.32	-79.1	-27.26	-28.47	-22	-21.84	N/A	N/A	N/A	N/A

Note: All test statistics are distributed N(0,1), under a null of no cointegration and diverge to negative infinity (save for panel v).
*Test statistics could not be calculated due to inadequate observations.
**Test statistics could not be calculated due to inadequate observations as a result of the inclusion of frontier countries sample in the full sample

APPENDIX-C: Classical ARDL and CS-ARDL Results

Table C1: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	ARDL(1,1)			ARDL(2,2)			ARDL(3,3)		
	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**
θ	**-0.083*** (0.000)**	**-0.195*** (0.000)**	**-0.193*** (0.000)**	**-0.091*** (0.000)**	**-0.203** (0.029)**	**-0.214*** (0.000)**	**-0.099*** (0.000)**	**-0.223*** (0.000)**	**-0.237*** (0.000)**
λ	**-0.929*** (0.000)**	**-0.939*** (0.000)**	**-0.944*** (0.000)**	**-0.950*** (0.000)**	**-0.967*** (0.000)**	**-0.975*** (0.000)**	**-0.917*** (0.000)**	**-0.942*** (0.000)**	**-0.953*** (0.000)**
γ	**-0.016*** (0.000)**	**-0.021*** (0.000)**	**-0.025*** (0.000)**	**-0.017*** (0.000)**	**-0.022*** (0.000)**	**-0.025*** (0.000)**	**-0.016*** (0.000)**	**-0.022*** (0.000)**	**-0.025*** (0.000)**
η	0.000 (0.490)	0.000 (0.463)	0.000 (0.145)	0.000 (0.582)	0.000 (0.485)	0.000 (0.149)	0.000 (0.465)	0.000 (0.436)	0.000 (0.143)
CD test statistics	**165.05*** (0.000)**	**164.32*** (0.000)**	**164.32*** (0.000)**	**164.78*** (0.000)**	**163.06*** (0.000)**	**163.06*** (0.000)**	**164.55*** (0.000)**	**162.00*** (0.000)**	**162.00*** (0.000)**
Hausman test statistics	0.00 (0.956) (MG vs PMG)			0.23 (0.635) (MG vs PMG)			0.60 (0.438) (MG vs PMG)		
	11.36* (0.001)** (MG vs DFE)			**14.83*** (0.000)** (MG vs DFE)			**20.68*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-20728.08	-20764.87	-	-20725.34	-20762.51	-	-20726.16	-20758.36
BIC Criterion	-	-20686.04	-20722.83	-	-20669.32	-20706.49	-	-20656.16	-20688.36
Observations	8153	8153	8153	8129	8129	8129	8105	8105	8105

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C1 (Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	ARDL(4,4)			ARDL(5,5)			ARDL(6,6)		
	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**
θ_{lnC}	**-0.094*** (0.000)**	**-0.212*** (0.000)**	**-0.228*** (0.000)**	**-0.081*** (0.000)**	**-0.190** (0.029)**	**-0.200*** (0.000)**	**-0.087*** (0.000)**	**-0.208*** (0.000)**	**-0.211*** (0.000)**
λ	**-0.900*** (0.000)**	**-0.923*** (0.000)**	**-0.936*** (0.000)**	**-0.902*** (0.000)**	**-0.919*** (0.000)**	**-0.936*** (0.000)**	**-0.907*** (0.000)**	**-0.933*** (0.000)**	**-0.954*** (0.000)**
γ	**-0.016*** (0.000)**	**-0.021*** (0.000)**	**-0.024*** (0.000)**	**-0.015*** (0.000)**	**-0.020*** (0.000)**	**-0.023*** (0.000)**	**-0.015*** (0.000)**	**-0.021*** (0.000)**	**-0.024*** (0.000)**
η	0.000 (0.566)	0.000 (0.468)	0.000 (0.145)	0.000 (0.936)	0.000 (0.480)	0.000 (0.198)	0.000 (0.880)	0.000 (0.518)	0.000 (0.217)
CD test statistics	**164.20*** (0.000)**	**160.96*** (0.000)**	**160.96*** (0.000)**	**164.01*** (0.000)**	**160.19*** (0.000)**	**160.19*** (0.000)**	**163.71*** (0.000)**	**159.39*** (0.000)**	**159.39*** (0.000)**
Hausman test statistics	1.26 (0.262) (MG vs PMG)			0.28 (0.600) (MG vs PMG)			0.02 (0.877) (MG vs PMG)		
	20.27* (0.000)** (MG vs DFE)			**13.76*** (0.000)** (MG vs DFE)			**16.30*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-20705.04	-20734.21	-	-20657.23	-20688.51	-	-20674	-20707.46
BIC Criterion	-	-20621.07	-20650.24	-	-20559.31	-20590.59	-	-20562.14	-20595.6
Observations	8081	8081	8081	8057	8057	8057	8033	8033	8033

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C2: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Composite Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=7)		CS-ARDL(p_x=p_y=2; p_z=7)		CS-ARDL(p_x=p_y=3; p_z=6)	
	PMG	MG	**PMG**	MG	**PMG**	MG
θ	**-0.063*** (0.002)**	**-0.062* (0.082)**	**-0.064*** (0.001)**	**-0.076** (0.013)**	**-0.080*** (0.000)**	**-0.096*** (0.000)**
λ	**-1.018*** (0.000)**	**-1.023*** (0.000)**	**-1.043*** (0.000)**	**-1.052*** (0.000)**	**-1.050*** (0.000)**	**-1.064*** (0.000)**
γ	0.000 (0.919)	-0.000 (0.911)	0.000 (0.869)	-0.000 (0.922)	0.001 (0.819)	-0.000 (0.997)
η	0.000 (0.317)	**0.000** (0.029)**	0.000 (0.311)	**0.000** (0.027)**	0.000 (0.254)	**0.000** (0.019)**
CD test statistics	**-12.00*** (0.000)**		**-11.81*** (0.000)**		**-11.79*** (0.000)**	
Hausman test statistics	0.00 (0.962) (MG vs PMG)		0.25 (0.614) (MG vs PMG)		0.71 (0.400) (MG vs PMG)	
AIC Criterion	-28422.29	-28462.15	-28473.94	-28512.71	-28529.06	-28567.21
BIC Criterion	-28268.53	-28308.4	-28306.21	-28351.97	-28361.26	-28406.4
Observations	8013	8013	8013	8013	8037	8037

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C3: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Emerging Countries Sample, 1984m01-2013m10)

	ARDL(1,1)			ARDL(2,2)			ARDL(3,3)		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	DFE	**PMG**	**MG**
θ	**-0.063*** (0.000)**	**-0.102*** (0.000)**	**-0.135*** (0.008)**	**-0.066*** (0.000)**	**-0.106*** (0.000)**	**-0.143*** (0.005)**	**-0.066*** (0.000)**	**-0.104*** (0.000)**	**-0.155*** (0.005)**
λ	**-0.933*** (0.000)**	**-0.926*** (0.000)**	**-0.930*** (0.000)**	**-0.952*** (0.000)**	**-0.941*** (0.000)**	**-0.948*** (0.000)**	**-0.930*** (0.000)**	**-0.929*** (0.000)**	**-0.939*** (0.000)**
γ	**-0.025*** (0.000)**	**-0.030*** (0.000)**	**-0.034*** (0.000)**	**-0.026*** (0.000)**	**-0.030*** (0.000)**	**-0.035*** (0.000)**	**-0.025*** (0.000)**	**-0.029*** (0.000)**	**-0.034*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**92.90*** (0.000)**	**92.75*** (0.000)**	**92.75*** (0.000)**	**93.23*** (0.000)**	**92.46*** (0.000)**	**92.46*** (0.000)**	**93.14*** (0.000)**	**92.26*** (0.000)**	**92.26*** (0.000)**
Hausman test statistics	0.55 (0.458) (MG vs PMG)			0.72 (0.396) (MG vs PMG)			1.08 (0.299) (MG vs PMG)		
	2.15 (0.142) (MG vs DFE)			2.47 (0.116) (MG vs DFE)			**2.80* (0.094)** (MG vs DFE)		
AIC Criterion	-	-9935.97	-9959.94		-9973.42	-9997.08		-9999.76	-10025.42
BIC Criterion	-	-9896.01	-9919.98		-9920.16	-9943.83		-9933.23	-9958.88
Observations	5772	5772	5772	5751	5751	5751	5730	5730	5730

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C3 (Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Emerging Countries Sample, 1984m01-2013m10)

	ARDL(4,4)			ARDL(5,5)			ARDL(6,6)		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	**DFE**	**PMG**	MG
θ	**-0.072*** (0.000)**	**-0.113*** (0.000)**	**-0.130*** (0.005)**	**-0.058*** (0.001)**	**-0.102*** (0.000)**	**-0.096** (0.028)**	**-0.062*** (0.000)**	**-0.101** (0.000)**	**-0.110** (0.012)**
λ	**-0.932*** (0.000)**	**-0.954*** (0.000)**	**-0.968*** (0.000)**	**-0.937*** (0.000)**	**-0.961*** (0.000)**	**-0.977*** (0.000)**	**-0.991*** (0.000)**	**-1.026*** (0.000)**	**-1.045*** (0.000)**
γ	**-0.026** (0.035)**	**-0.030*** (0.000)**	**-0.034*** (0.000)**	**-0.027** (0.013)**	**-0.032*** (0.000)**	**-0.036*** (0.000)**	**-0.027** (0.000)**	**-0.033*** (0.000)**	**-0.037*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**93.70*** (0.000)**	**91.95*** (0.000)**	**91.95*** (0.000)**	**94.15*** (0.000)**	**91.98*** (0.000)**	**91.98*** (0.000)**	**93.95*** (0.000)**	**91.25*** (0.000)**	**91.25*** (0.000)**
Hausman test statistics	0.19 (0.661) (MG vs PMG)			0.03 (0.860) (MG vs PMG)			0.06 (0.806) (MG vs PMG)		
	1.76 (0.184) (MG vs DFE)			0.87 (0.352) (MG vs DFE)			1.39 (0.239) (MG vs DFE)		
AIC Criterion	-	-10057.46	-10080.32	-	-9985.31	-10013.63	-	-10113.59	-10139.97
BIC Criterion	-	-9977.66	-10000.53	-	-9892.26	-9920.58	-	-10007.31	-10033.69
Observations	5709	5709	5709	5688	5688	5688		5667	5667

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C4: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Composite Risk Ratings, Emerging Country Sample, 1988m01-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=6)		CS-ARDL(p_x=p_y=2; p_z=6)		CS-ARDL(p_x=p_y=3; pz=6)	
	PMG	MG	**PMG**	MG	**PMG**	MG
θ	**-0.089*** (0.000)**	**-0.081** (0.035)**	**-0.097*** (0.000)**	**-0.090** (0.022)**	**-0.088*** (0.000)**	**-0.088** (0.034)**
λ	**-1.040*** (0.000)**	**-1.044*** (0.000)**	**-1.067*** (0.000)**	**-1.075*** (0.000)**	**-1.114*** (0.000)**	**-1.128*** (0.000)**
γ	0.003 (0.530)	0.003 (0.411)	0.003 (0.503)	0.004 (0.340)	0.004 (0.483)	0.003 (0.403)
η	-0.000 (0.360)	-0.000 (0.167)	-0.000 (0.400)	-0.000 (0.132)	-0.000 (0.435)	-0.000 (0.134)
CD test statistics	**-11.19*** (0.000)**		**-11.07*** (0.000)**		**-10.88*** (0.000)**	
Hausman test statistics	0.07 (0.788) (MG vs PMG)		0.05 (0.818) (MG vs PMG)		0.00 (0.995) (MG vs PMG)	
AIC Criterion	-13482.35	-13509.38	-13541.42	-13568.75	-13593.83	-13626.17
BIC Criterion	-13349.46	-13376.5	-13401.89	-13435.86	-13454.3	-13493.29
Observations	5677	5677	5677	5677	5677	5677

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C5: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Frontier Countries Sample, 1984m01-2013m10)

	ARDL(1,1)			ARDL(2,2)			ARDL(3,3)		
	DFE	**PMG**	MG	**DFE**	PMG	**MG**	**DFE**	PMG	**MG**
θ	**-0.074** (0.012)**	-0.033 (0.210)	-0.075 (0.425)	**-0.088*** (0.007)**	**-0.051* (0.076)**	**-0.184** (0.018)**	**-0.094*** (0.003)**	**-0.057** (0.049)**	**-0.203** (0.025)**
λ	**-0.894*** (0.000)**	**-0.870*** (0.000)**	**-0.882*** (0.000)**	**-0.870*** (0.000)**	**-0.875*** (0.000)**	**-0.897*** (0.000)**	**-0.858*** (0.000)**	**-0.883*** (0.000)**	**-0.920*** (0.000)**
γ	**-0.034*** (0.000)**	**-0.031*** (0.000)**	**-0.038*** (0.000)**	**-0.034*** (0.000)**	**-0.029*** (0.000)**	**-0.037*** (0.000)**	**-0.032*** (0.000)**	**-0.028*** (0.000)**	**-0.035*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000** (0.022)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000** (0.047)**
CD test statistics	**47.09*** (0.000)**	**43.78*** (0.000)**	**43.78*** (0.000)**	**46.30*** (0.000)**	**41.00*** (0.000)**	**41.00*** (0.000)**	**45.82*** (0.000)**	**38.96*** (0.000)**	**38.96*** (0.000)**
Hausman test statistics	0.21 (0.645) (MG vs PMG)			**3.42*** (0.065) (MG vs PMG)			**2.88*** (0.090) (MG vs PMG)		
	0.00 (0.995) (MG vs DFE)			1.86 (0.173) (MG vs DFE)			1.64 (0.201) (MG vs DFE)		
AIC Criterion	-	-7673.32	-7708.15	-	-7746.11	-7777.39	-	-7765.98	-7801.909
BIC Criterion	-	-7635.98	-7670.82	-	-7696.39	-7727.68	-	-7703.92	-7739.849
Observations	3723	3723	3723	3693	3693	3693	3663	3663	3663

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C5 (Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Frontier Countries Sample, 1984m01-2013m10)

	ARDL(4,4)			**ARDL(5,5)**			**ARDL(6,6)**		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	**DFE**	**PMG**	MG
θ	**-0.097*** (0.002)**	**-0.069** (0.023)**	**-0.198* (0.054)**	**-0.084*** (0.003)**	**-0.058** (0.043)**	-0.143 (0.165)	**-0.087*** (0.002)**	**-0.076*** (0.009)**	-0.155 (0.129)
λ	**-0.836*** (0.000)**	**-0.852*** (0.000)**	**-0.903*** (0.000)**	**-0.840*** (0.000)**	**-0.892*** (0.000)**	**-0.940*** (0.000)**	**-0.919*** (0.000)**	**-0.978*** (0.000)**	**-1.059*** (0.000)**
γ	**-0.032** (0.035)**	**-0.029*** (0.000)**	**-0.036*** (0.000)**	**-0.032** (0.013)**	**-0.030*** (0.000)**	**-0.037*** (0.000)**	**-0.035** (0.000)**	**-0.031*** (0.000)**	**-0.036*** (0.000)**
η	**0.000*** (0.000)**	**0.000** (0.022)**	0.000 (0.256)	**0.000*** (0.000)**	**0.000** (0.020)**	**0.000*** (0.029)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**45.95*** (0.000)**	**37.68*** (0.000)**	**37.68*** (0.000)**	**44.19*** (0.000)**	**34.60*** (0.000)**	**34.60*** (0.000)**	**44.60*** (0.000)**	**32.81*** (0.000)**	**32.81*** (0.000)**
Hausman test statistics	1.72 (0.190) (MG vs PMG)			0.75 (0.388) (MG vs PMG)			0.65 (0.420) (MG vs PMG)		
	1.06 (0.303) (MG vs DFE)			0.35 (0.553) (MG vs DFE)			0.49(0.485) (MG vs DFE)		
AIC Criterion	-	-7759.50	-7796.25	-	-7759.85	-7799.66	-	-7847.15	-7889.40
BIC Criterion	-	-7685.13	-7721.88	-	-7673.19	-7713.01	-	-7748.25	-7790.50
Observations	3633	3633	3633	3603	3603	3603		3573	3573

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C6: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Composite Risk Ratings, Frontier Country Sample, 1984m01-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=6)		**CS-ARDL(p_x=p_y=2; p_z=6)**		**CS-ARDL(p_x=p_y=3; p_z=6)**	
	PMG	**MG**	PMG	**MG**	**PMG**	**MG**
θ	0.005 (0.889)	-0.052 (0.589)	-0.016 (0.652)	**-0.257*** **(0.082)**	-0.018 (0.599)	**-0.327*** **(0.098)**
λ	**-1.038***** **(0.000)**	**-1.046***** **(0.000)**	**-1.122***** **(0.000)**	**-1.133***** **(0.000)**	**-1.212***** **(0.000)**	**-1.227***** **(0.000)**
γ	-0.000 (0.933)	-0.003 (0.540)	-0.001 (0.739)	-0.004 (0.396)	-0.004 (0.379)	-0.008 (0.142)
η	-0.001 (0.321)	-0.001 (0.383)	-0.000 (0.386)	-0.001 (0.390)	-0.001 (0.372)	-0.001 (0.365)
CD test statistics	**-4.55***** **(0.000)**		**-4.19 ***** **(0.000)**		**-4.09***** **(0.000)**	
Hausman test statistics	0.41 (0.522) (MG vs PMG)		**2.82* (0.093)** (MG vs PMG)		2.51 (0.113) (MG vs PMG)	
AIC Criterion	-9549.698	-9576.757	-9662.951	-9698.817	-9770.897	-9803.735
BIC Criterion	-9425.918	-9452.978	-9526.794	-9562.66	-9622.362	-9655.2
Observations	3601	3601	3601	3601	3601	3601

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C7: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	ARDL(1,1)			ARDL(2,2)			ARDL(3,3)		
	DFE	PMG	**MG**	DFE	PMG	**MG**	DFE	PMG	**MG**
θ	**-0.048*** (0.000)**	**-0.106*** (0.000)**	**-0.154*** (0.000)**	**-0.052*** (0.000)**	**-0.119*** (0.000)**	**-0.168*** (0.000)**	**-0.055*** (0.003)**	**-0.126*** (0.000)**	**-0.186*** (0.000)**
λ	**-0.937*** (0.000)**	**-0.934*** (0.000)**	**-0.940*** (0.000)**	**-0.950*** (0.000)**	**-0.950*** (0.000)**	**-0.959*** (0.000)**	**-0.930*** (0.000)**	**-0.933*** (0.000)**	**-0.946*** (0.000)**
γ	**-0.018*** (0.000)**	**-0.024*** (0.000)**	**-0.028*** (0.000)**	**-0.018*** (0.000)**	**-0.024*** (0.000)**	**-0.028*** (0.000)**	**-0.018*** (0.000)**	**-0.024*** (0.000)**	**-0.028*** (0.000)**
η	**0.000*** (0.001)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000** (0.000)**
CD test statistics	**232.26*** (0.000)**	**231.54*** (0.000)**	**231.54*** (0.000)**	**232.87*** (0.000)**	**229.86*** (0.000)**	**229.86*** (0.000)**	**232.77*** (0.000)**	**229.09*** (0.000)**	**229.09*** (0.000)**
Hausman test statistics	**4.34** (0.037)** (MG vs PMG)			**4.63** (0.031)** (MG vs PMG)			**6.40*** (0.011)** (MG vs PMG)		
	17.66*(0.000)** (MG vs DFE)			**21.62*** (0.000)** (MG vs DFE)			**25.88*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-33698.86	-33782.48		-33735.79	-33817.48		-33766.6	-33846.85
BIC Criterion	-	-33653	-33736.61		-33674.66	-33756.34		-33690.22	-33770.47
Observations	15440	15440	15440	15389	15389	15389	15338	15338	15338

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C7(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Composite Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	ARDL(4,4)			ARDL(5,5)			ARDL(6,6)		
	DFE	PMG	**MG**	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**
θ	**-0.057*** (0.000)**	**-0.130*** (0.000)**	**-0.173*** (0.000)**	**-0.044*** (0.001)**	**-0.116*** (0.043)**	**-0.143*** (0.000)**	**-0.048*** (0.002)**	**-0.122*** (0.000)**	**-0.153*** (0.000)**
λ	**-0.924*** (0.000)**	**-0.936*** (0.000)**	**-0.952*** (0.000)**	**-0.927*** (0.000)**	**-0.937*** (0.000)**	**-0.956*** (0.000)**	**-0.962*** (0.000)**	**-0.975*** (0.000)**	**-0.998*** (0.000)**
γ	**-0.018** (0.000)**	**-0.024*** (0.000)**	**-0.028*** (0.000)**	**-0.018*** (0.000)**	**-0.024*** (0.000)**	**-0.028*** (0.000)**	**-0.018*** (0.000)**	**-0.025*** (0.000)**	**-0.029*** (0.000)**
η	**0.000*** (0.000)**	**0.000** (0.022)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.000** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.002)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**233.303 *** (0.000)**	**227.84*** (0.000)**	**227.84*** (0.000)**	**233.75*** (0.000)**	**227.37*** (0.000)**	**227.37*** (0.000)**	**233.50*** (0.000)**	**226.12*** (0.000)**	**226.12*** (0.000)**
Hausman test statistics	**4.48** (0.034)** (MG vs PMG)			1.93 (0.165) (MG vs PMG)			2.43 (0.119) (MG vs PMG)		
	25.51* (0.000)** (MG vs DFE)			**18.76*** (0.000)** (MG vs DFE)			**21.41*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-33815.71	-33885.55	-	-33702.69	-33777	-	-33849.21	-33926.24
BIC Criterion	-	-33724.09	-33793.93	-	-33595.85	-33670.17	-	-33727.16	-33804.19
Observations	15287	15287	15287	15236	15236	15236	15185	15185	15185

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C8: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Composite Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=7)		CS-ARDL(p_x=p_y=2; p_z=7)		CS-ARDL(p_x=p_y=3; p_z=6)	
	PMG	**MG**	PMG	**MG**	PMG	**MG**
θ	**-0.062*** (0.000)**	**-0.078*** (0.000)**	**-0.070*** (0.000)**	**-0.088*** (0.000)**	**-0.082*** (0.000)**	**-0.102*** (0.000)**
λ	**-1.022*** (0.000)**	**-1.025*** (0.000)**	**-1.033*** (0.000)**	**-1.040*** (0.000)**	**-1.053*** (0.000)**	**-1.063*** (0.000)**
γ	-0.000 (0.914)	-0.001 (0.651)	-0.000 (0.911)	-0.001 (0.720)	-0.001 (0.764)	-0.001 (0.590)
η	0.000 (0.257)	0.000 (0.113)	0.000 (0.245)	0.000 (0.100)	0.000 (0.140)	0.000 (0.102)
CD test statistics	**-7.57*** (0.000)**		**-7.44*** (0.000)**		**-7.45*** (0.000)**	
Hausman test statistics	**3.01* (0.083)** (MG vs PMG)		**3.26* (0.071)** (MG vs PMG)		**2.72* (0.099)** (MG vs PMG)	
AIC Criterion	-43555.96	-43618.72	-43684	-43743	-43822.21	-43879.74
BIC Criterion	-43388.17	-43450.93	-43500.95	-43559.96	-43639.09	-43696.62
Observations	15165	15165	15165	15165	15216	15216

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C9: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	**MG**	DFE	PMG	**MG**	DFE	PMG	**MG**
θ_{lnP}	-0.022 (0.102)	**-0.046** (0.016)**	**-0.072*** (0.007)**	-0.020 (0.161)	**-0.040** (0.029)**	**-0.069** (0.014)**	-0.022 (0.133)	**-0.046** (0.017)**	**-0.084*** (0.004)**
θ_{lnF}	0.007 (0.418)	-0.015 (0.249)	**-0.050** (0.020)**	0.001 (0.920)	**-0.027** (0.032)**	**-0.073*** (0.002)**	-0.000 (0.986)	**-0.032** (0.016)**	**-0.077*** (0.001)**
θ_{lnE}	**-0.057*** (0.000)**	**-0.112*** (0.000)**	**-0.104*** (0.000)**	**-0.060*** (0.000)**	**-0.123*** (0.000)**	**-0.115*** (0.000)**	**-0.064*** (0.000)**	**-0.128*** (0.000)**	**-0.120*** (0.000)**
λ	**-0.931*** (0.000)**	**-0.944*** (0.000)**	**-0.956*** (0.000)**	**-0.954*** (0.000)**	**-0.975*** (0.000)**	**-0.997*** (0.000)**	**-0.925*** (0.000)**	**-0.955*** (0.000)**	**-0.989*** (0.000)**
γ	**-0.021*** (0.000)**	**-0.028*** (0.000)**	**-0.035*** (0.000)**	**-0.021*** (0.000)**	**-0.029*** (0.000)**	**-0.038*** (0.000)**	**-0.021*** (0.000)**	**-0.029*** (0.000)**	**-0.037*** (0.000)**
η	**0.000** (0.029)**	**0.000*** (0.000)**	0.000 (0.234)	**0.000** (0.044)**	**0.000*** (0.000)**	0.000 (0.381)	**0.000** (0.024)**	**0.000*** (0.000)**	0.000 (0.532)
CD test statistics	**163.55*** (0.000)**	**160.82*** (0.000)**	**160.82*** (0.000)**	**162.85*** (0.000)**	**157.85*** (0.000)**	**157.85*** (0.000)**	**162.67*** (0.000)**	**156.09*** (0.000)**	**156.09*** (0.000)**
Hausman test statistics	5.27 (0.153) (MG vs PMG) **17.55*** (0.001)** (MG vs DFE)			**6.36* (0.095)** (MG vs PMG) **24.13*** (0.000)** (MG vs DFE)			**9.31** (0.025)** (MG vs PMG) **31.58*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-20835.95	-20929.26	-	-20912.76	-21017.74	-	-20945.78	-21046.53
BIC Criterion	-	-20765.89	-20859.2	-	-20814.71	-20919.69	-	-20819.78	-20920.53
Observations	8153	8153	8153	8129	8129	8129	8105	8105	8105

Notes: The Panel ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C9(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	PMG	**MG**	DFE	PMG	**MG**	DFE	PMG	**MG**
θ_{lnP}	-0.018 (0.234)	**-0.037*** **(0.057)**	**-0.080***** **(0.009)**	-0.013 (0.385)	-0.029 (0.135)	**-0.076***** **(0.024)**	-0.006 (0.669)	-0.022 (0.253)	**-0.059***** **(0.045)**
θ_{lnF}	0.003 (0.785)	**-0.026*** **(0.053)**	**-0.071******* **(0.002)**	-0.002 (0.852)	**-0.030***** **(0.028)**	**-0.078******* **(0.003)**	-0.001 (0.892)	**-0.028***** **(0.035)**	**-0.074******* **(0.002)**
θ_{lnE}	**-0.066******* **(0.000)**	**-0.134******* **(0.000)**	**-0.126******* **(0.000)**	**-0.064******* **(0.000)**	**-0.138******* **(0.000)**	**-0.129******* **(0.000)**	**-0.066******* **(0.000)**	**-0.145******* **(0.000)**	**-0.143******* **(0.000)**
λ	**-0.906******* **(0.000)**	**-0.943******* **(0.000)**	**-0.987******* **(0.000)**	**-0.918******* **(0.000)**	**-0.952******* **(0.000)**	**-1.009******* **(0.000)**	**-0.911******* **(0.000)**	**-0.956******* **(0.000)**	**-1.013******* **(0.000)**
γ	**-0.021******* **(0.000)**	**-0.028******* **(0.000)**	**-0.037******* **(0.000)**	**-0.020******* **(0.000)**	**-0.029******* **(0.000)**	**-0.037******* **(0.000)**	**-0.020******* **(0.000)**	**-0.029******* **(0.000)**	**-0.038******* **(0.000)**
η	**0.000***** **(0.031)**	**0.000******* **(0.000)**	0.000 (0.539)	**0.000*** **(0.094)**	**0.000******* **(0.001)**	0.000 (0.482)	0.000 (0.128)	**0.000******* **(0.001)**	**0.000******* **(0.009)**
CD test statistics	**162.12******* **(0.000)**	**153.98******* **(0.000)**	**153.98******* **(0.000)**	**161.89******* **(0.000)**	**152.52******* **(0.000)**	**152.52******* **(0.000)**	**161.63******* **(0.000)**	**151.07******* **(0.000)**	**151.07******* **(0.000)**
Hausman test statistics	**12.66* (0.005)** (MG vs PMG) **35.09*** (0.000)** (MG vs DFE)			**6.69* (0.083)** (MG vs PMG) **33.12*** (0.000)** (MG vs DFE)			**7.26* (0.064)** (MG vs PMG) **40.67*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-20968.11	-21003.52	-	-21003.35	-21046.11	-	-21046.74	-21147.13
BIC Criterion	-	-20814.17	-20856.58	-	-20821.49	-20885.24	-	-20864.96	-20986.33
Observations	8081	8081	8081	8081	8057	8057	8033	8033	8033

Notes: The Panel ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C10: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01-2013m10)

	CS-ARDL (p_x=p_y=1,p_z=3)			CS-ARDL(p_x=p_y=2,p_z=3)	
	PMG	MG		**PMG**	MG
θ_{lnP}	**-0.032*** **(0.064)**	**-0.064**** **(0.032)**		-0.001 (0.957)	-0.017 (0.508)
θ_{lnF}	-0.018 (0.143)	-0.037 (0.116)		**-0.031***** **(0.007)**	-0.035 (0.104)
θ_{lnE}	**-0.096***** **(0.000)**	**-0.080***** **(0.006)**		**-0.027**** **(0.043)**	-0.015 (0.597)
λ	**-0.737***** **(0.000)**	**-0.753***** **(0.000)**		**-1.049***** **(0.000)**	**-1.071***** **(0.000)**
γ	**-0.018***** **(0.000)**	**-0.023***** **(0.000)**		0.000 (0.906)	0.001 (0.815)
η	**0.000***** **(0.008)**	0.000 (0.880)		0.000 (0.795)	0.000 (0.697)
CD test statistics	**-11.91***** **(0.000)**			**-11.69***** **(0.000)**	
Hausman test statistics	2.01 (0.570) (MG vs PMG)			1.33 (0.734) (MG vs PMG)	
AIC Criterion	-26694.9	-26806.51		-28893.1	-29005.07
BIC Criterion	-26512.95	-26645.56		-28711.09	-28844.05
Observations	8085	8085		8109	8109

Notes: The cross-sectionally augmented Panel ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y}\varphi_{il}\Delta y_{i,t-l} + \sum_{l=0}^{p_x}\beta'_{il}x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}}\psi'_{il}{}' \, \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y}\hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1}\sum_{l=0}^{p_x}\hat{\beta}_{il}$

Table C11: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2013m10)

	ARDL(1,1,1,1)				ARDL(2,2,2,2)				ARDL(3,3,3,3)		
	DFE	**PMG**	MG		**DFE**	**PMG**	MG		**DFE**	**PMG**	MG
θ_{lnP}	**-0.063*** (0.004)**	**-0.075*** (0.001)**	-0.050 (0.235)		**-0.070*** (0.001)**	**-0.075*** (0.001)**	-0.056 (0.188)		**-0.072*** (0.001)**	**-0.069*** (0.003)**	-0.059 (0.160)
θ_{lnF}	**0.028* (0.094)**	**0.045** (0.019)**	0.025 (0.474)		**0.029* (0.064)**	**0.040** (0.037)**	0.013 (0.716)		**0.030* (0.062)**	**0.038* (0.051)**	0.008 (0.832)
θ_{lnE}	**-0.032* (0.086)**	**-0.069*** (0.001)**	**-0.073** (0.018)**		**-0.028* (0.089)**	**-0.074*** (0.000)**	**-0.073** (0.029)**		**-0.029* (0.074)**	**-0.071*** (0.001)**	**-0.073** (0.019)**
λ	**-0.939*** (0.000)**	**-0.934*** (0.000)**	**0.947*** (0.000)**		**-0.960*** (0.000)**	**-0.952*** (0.000)**	**-0.977*** (0.000)**		**-0.938*** (0.000)**	**-0.944*** (0.000)**	**-0.979*** (0.000)**
γ	**-0.029*** (0.000)**	**-0.034*** (0.000)**	**-0.045*** (0.000)**		**-0.030*** (0.000)**	**-0.035*** (0.000)**	**-0.049*** (0.000)**		**-0.030*** (0.000)**	**-0.034*** (0.000)**	**-0.048*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**		**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**		**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**91.98*** (0.000)**	**89.47*** (0.000)**	**89.47*** (0.000)**		**92.30*** (0.000)**	**88.56*** (0.000)**	**88.56*** (0.000)**		**92.28*** (0.000)**	**87.71*** (0.000)**	**87.71*** (0.000)**
Hausman test statistics	0.93 (0.818) (MG vs PMG)				1.08 (0.783) (MG vs PMG)				1.14 (0.767) (MG vs PMG)		
	4.00 (0.261) (MG vs DFE)				4.11 (0.250) (MG vs DFE)				4.52 (0.210) (MG vs DFE)		
AIC Criterion	-	-10040.33	-10121.14			-10135.45	-10218.49			-10207.07	-10284.32
BIC Criterion	-	-9973.72	-10054.53			-10042.25	-10125.29			-10087.31	-10164.56
Observations	5772	5772	5772		5751	5751	5751		5730	5730	5730

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C11(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**
θ_{lnP}	**-0.065*** (0.003)**	**-0.060*** (0.007)**	-0.028 (0.513)	**-0.063*** (0.004)**	**-0.062*** (0.004)**	-0.008 (0.838)	**-0.061*** (0.006)**	**-0.053** (0.013)**	0.005 0.891
θ_{lnF}	0.025 (0.197)	**0.037* (0.052)**	0.013 (0.756)	0.031 (0.102)	**0.045** (0.017)**	0.028 (0.531)	0.034 (0.123)	**0.050*** (0.006)**	0.023 (0.612)
θ_{lnE}	**-0.034** (0.035)**	**-0.081*** (0.000)**	**-0.073*** (0.020)**	**-0.038** (0.013)**	**-0.093*** (0.000)**	**-0.092*** (0.002)**	**-0.036** (0.045)**	**-0.090*** (0.000)**	**-0.092*** (0.003)**
λ	**-0.942*** (0.000)**	**-0.977*** (0.000)**	**-1.025*** (0.000)**	**-0.977*** (0.000)**	**-1.011*** (0.000)**	**-1.074*** (0.000)**	**-1.004*** (0.000)**	**-1.052*** (0.000)**	**-1.131*** (0.000)**
γ	**-0.030*** (0.000)**	**-0.035*** (0.000)**	**-0.049*** (0.000)**	**-0.031*** (0.000)**	**-0.039*** (0.000)**	**-0.054*** (0.000)**	**-0.032*** (0.000)**	**-0.040*** (0.000)**	**-0.057*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**92.63*** (0.000)**	**86.52*** (0.000)**	**86.52*** (0.000)**	**93.00*** (0.000)**	**85.68*** (0.000)**	**85.68*** (0.000)**	**92.67*** (0.000)**	**83.83*** (0.000)**	**83.83*** (0.000)**
Hausman test statistics	1.20 (0.752) (MG vs PMG)			3.37 (0.337) (MG vs PMG)			3.27 (0.352) (MG vs PMG)		
	3.40 (0.334) (MG vs DFE)			**6.52* (0.089)** (MG vs DFE)			**7.60* (0.055)** (MG vs DFE)		
AIC Criterion	-	-10324.71	-10412.67	-	-10417.34	-10518.33	-	-10532.2	-10645.3
BIC Criterion	-	-10178.42	-10279.67	-	-10264.48	-10385.4	-	-10379.42	-10512.46
Observations	5709	5709	5709	5688	5688	5688		5667	5667

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C12: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2013m10)

	CS-ARDL (p_x=p_y=1, p_z=3)			CS-ARDL(p_x=p_y=2, p_z=3)	
	PMG	MG		PMG	**MG**
θ_{lnP}	**-0.043** (0.031)**	-0.022 (0.646)		**-0.070*** (0.003)**	**-0.105*** (0.005)**
θ_{lnF}	**0.048*** (0.005)**	**0.054* (0.086)**		-0.006 (0.775)	-0.005 (0.856)
θ_{lnE}	**-0.045** (0.013)**	-0.047 (0.140)		-0.020 (0.298)	-0.027 (0.290)
λ	**-0.870*** (0.000)**	**-0.887*** (0.000)**		**-1.073*** (0.000)**	**-1.098*** (0.000)**
γ	**-0.021*** (0.000)**	**-0.028*** (0.000)**		0.001 (0.791)	0.003 (0.655)
η	**0.000*** (0.000)**	**0.000*** (0.000)**		0.000 (0.926)	-0.000 (0.482)
CD test statistics	**-11.06*** (0.000)**			**-10.83*** (0.000)**	
Hausman test statistics	1.39 (0.709) (MG vs PMG)			**8.95** (0.030)** (MG vs PMG)	
AIC Criterion	-12840.32	-12938.95		-13785.36	-13878.05
BIC Criterion	-12687.33	-12805.91		-13632.29	-13744.94
Observations	5179	5179		5740	5740

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}\, \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C13: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2013m10)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	PMG	**MG**	**DFE**	**PMG**	MG	**DFE**	**PMG**	MG
θ_{lnP}	**-0.054** (0.023)**	-0.039 (0.169)	-0.036 (0.871)	**-0.050** (0.034)**	-0.041 (0.178)	-0.053 (0.819)	**-0.044* (0.069)**	-0.038 (0.213)	0.172 (0.581)
θ_{lnF}	**0.038* (0.054)**	**0.055** (0.028)**	**0.191** (0.027)**	0.024 (0.242)	**0.046* (0.076)**	0.087 (0.219)	0.013 (0.547)	0.040 (0.123)	0.135 (0.134)
θ_{lnE}	**-0.075*** (0.000)**	**-0.080*** (0.000)**	**-0.147*** (0.000)**	**-0.072*** (0.001)**	**-0.083*** (0.000)**	**-0.115*** (0.001)**	**-0.067*** (0.000)**	**-0.086*** (0.000)**	**-0.095** (0.015)**
λ	**-0.898*** (0.000)**	**-0.877*** (0.000)**	**-0.918*** (0.000)**	**-0.880*** (0.000)**	**-0.889*** (0.000)**	**-0.954*** (0.000)**	**-0.874 *** (0.000)**	**-0.910*** (0.000)**	**-1.022*** (0.000)**
γ	**-0.037*** (0.000)**	**-0.035*** (0.000)**	**-0.037*** (0.000)**	**-0.037*** (0.000)**	**-0.034*** (0.000)**	**-0.040*** (0.000)**	**-0.036*** (0.000)**	**-0.033*** (0.000)**	**-0.040*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.001** (0.047)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.001* (0.051)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.001** (0.018)**
CD test statistics	**44.86*** (0.000)**	**37.68*** (0.000)**	**37.68*** (0.000)**	**43.30*** (0.000)**	**32.04*** (0.000)**	**32.04*** (0.000)**	**43.06*** (0.000)**	**29.03*** (0.000)**	**29.03*** (0.000)**
Hausman test statistics	**10.79** (0.013)** (MG vs PMG) **11.52*** (0.009)** (MG vs DFE)			2.85 (0.416) (MG vs PMG) 6.03 (0.110) (MG vs DFE)			1.56 (0.668) (MG vs PMG) 2.14 (0.544) (MG vs DFE)		
AIC Criterion	-	-7755.30	-7871.91	-	-7939.89	-8046.82	-	-8011.83	-8147.60
BIC Criterion	-	-7693.08	-7809.68	-	-7852.89	-7959.82	-	-7900.12	-8035.89
Observations	3723	3723	3723	3693	3693	3693	3663	3663	3663

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C13(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	DFE	PMG	**MG**
θ_{lnP}	**-0.044*** **(0.060)**	-0.025 (0.420)	0.179 (0.605)	**-0.041**** **(0.028)**	-0.001 (0.968)	0.568 (0.197)	**-0.045**** **(0.018)**	0.011 (0.722)	-0.270 (0.642)
θ_{lnF}	0.013 (0.500)	0.022 (0.406)	0.109 (0.222)	0.017 (0.335)	0.002 (0.927)	0.173 (0.131)	0.026 (0.111)	0.001 (0.963)	**0.256**** **(0.020)**
θ_{lnE}	**-0.068***** **(0.000)**	**-0.090***** **(0.000)**	**-0.095***** **(0.010)**	**-0.071***** **(0.000)**	**-0.093***** **(0.000)**	**-0.110**** **(0.014)**	**-0.077***** **(0.000)**	**-0.108***** **(0.000)**	**-0.237**** **(0.018)**
λ	**-0.856***** **(0.000)**	**-0.858***** **(0.000)**	**-1.025***** **(0.000)**	**-0.871***** **(0.000)**	**-0.768***** **(0.000)**	**-0.981***** **(0.000)**	**-0.937***** **(0.000)**	**-0.821***** **(0.000)**	**-1.149***** **(0.000)**
γ	**-0.036***** **(0.000)**	**-0.034***** **(0.000)**	**-0.042***** **(0.000)**	**-0.036***** **(0.000)**	**-0.037***** **(0.000)**	**-0.044***** **(0.000)**	**-0.039***** **(0.000)**	**-0.036***** **(0.000)**	**-0.038***** **(0.000)**
η	**0.000***** **(0.000)**	**0.000*** **(0.072)**	**0.001**** **(0.024)**	**0.000***** **(0.000)**	-0.000 (0.631)	0.001 (0.137)	**0.000***** **(0.000)**	-0.000 (0.530)	0.002 (0.250)
CD test statistics	**43.15***** **(0.000)**	**27.05***** **(0.000)**	**27.05***** **(0.000)**	**40.81***** **(0.000)**	**23.66***** **(0.000)**	**23.66***** **(0.000)**	**40.78***** **(0.000)**	**23.25***** **(0.000)**	**23.25***** **(0.000)**
Hausman test statistics	1.11 (0.776) (MG vs PMG)			2.95 (0.399) (MG vs PMG)			**7.82** (0.050)** (MG vs PMG)		
	1.59 (0.662) (MG vs DFE)			2.90 (0.407) (MG vs DFE)			**7.05* (0.070)** (MG vs DFE)		
AIC Criterion	-	-8108.33	-8248.18	-	-8261.14	-8406.74	-	-8428.91	
BIC Criterion	-	-7971.97	-8111.83	-	-8100.21	-8245.81	-	-8243.47	
Observations	3633	3633	3633	3603	3603	3603	3573	3573	3573

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C14: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=3)			CS-ARDL(p_x=p_y=2; p_z=3)	
	PMG	MG		**PMG**	MG
θ_{lnP}	**-0.048* (0.075)**	-0.030 (0.881)		**-0.085** (0.015)**	-0.148 (0.548)
θ_{lnF}	**0.068*** (0.005)**	**0.299*** (0.006)**		**0.042* (0.068)**	0.083 (0.369)
θ_{lnE}	-0.035 (0.103)	**-0.111* (0.058)**		-0.003 (0.890)	-0.126 (0.158)
λ	**-0.851*** (0.000)**	**-0.897*** (0.000)**		**-1.170*** (0.000)**	**-1.199*** (0.000)**
γ	**-0.022*** (0.000)**	**-0.019*** (0.000)**		-0.003 (0.589)	-0.000 (0.993)
η	0.000 (0.150)	0.001 (0.105)		-0.001 (0.170)	-0.004 (0.309)
CD test statistics	**-4.98*** (0.000)**			**-5.02*** (0.000)**	
Hausman test statistics	5.32 (0.150) (MG vs PMG)			2.49 (0.478) (MG vs PMG)	
AIC Criterion	-9361.56	-9494.82		-10180.64	-10342.08
BIC Criterion	-9200.21	-9333.48		-9994.23	-10161.88
Observations	3661	3661		3691	3691

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C15: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	**MG**	DFE	PMG	**MG**	DFE	PMG	**MG**
θ_{lnP}	**-0.040*** (0.000)**	**-0.037*** (0.002)**	**-0.061*** (0.005)**	**-0.042*** (0.000)**	**-0.033*** (0.007)**	**-0.063*** (0.004)**	**-0.042*** (0.000)**	**-0.034*** (0.006)**	**-0.074*** (0.001)**
θ_{lnF}	**0.025*** (0.000)**	**0.017* (0.074)**	-0.007 (0.724)	**0.023*** (0.000)**	0.006 (0.520)	-0.023 (0.278)	**0.023*** (0.001)**	0.005 (0.595)	-0.027 (0.202)
θ_{lnE}	**-0.044*** (0.000)**	**-0.084*** (0.000)**	**-0.090*** (0.000)**	**-0.042*** (0.000)**	**-0.091*** (0.000)**	**-0.096*** (0.000)**	**-0.043*** (0.000)**	**-0.093*** (0.000)**	**-0.100*** (0.000)**
λ	**-0.941*** (0.000)**	**-0.940*** (0.000)**	**-0.954*** (0.000)**	**-0.958*** (0.000)**	**-0.958*** (0.000)**	**-0.985*** (0.000)**	**-0.939*** (0.000)**	**-0.946*** (0.000)**	**-0.984*** (0.000)**
γ	**-0.023*** (0.000)**	**-0.029*** (0.000)**	**-0.038*** (0.000)**	**-0.023*** (0.000)**	**-0.030*** (0.000)**	**-0.041*** (0.000)**	**-0.023*** (0.000)**	**-0.029*** (0.000)**	**-0.040*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.002)**
CD test statistics*	**229.14*** (0.000)**	**224.30*** (0.000)**	**224.30*** (0.000)**	**229.27*** (0.000)**	**219.62*** (0.000)**	**219.62*** (0.000)**	**229.29*** (0.000)**	**217.37*** (0.000)**	**217.37*** (0.000)**
Hausman test statistics	4.74 (0.192) (MG vs PMG)			**6.85* (0.077)** (MG vs PMG)			**10.95** (0.012)** (MG vs PMG)		
	18.49* (0.000)** (MG vs DFE)			**26.72*** (0.000)** (MG vs DFE)			**32.09*** (0.000)** (MG vs DFE)		
AIC Criterion	-	-33931.49	-34145.46	-	-34122.11	-34350.79	-	-34256.71	-34474.89
BIC Criterion	-	-33855.04	-34069.01	-	-34015.13	-34243.81	-	-34119.23	-34337.4
Observations	15440	15440	15440	15389	15389	15389	15338	15338	15338

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C15(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	PMG	MG	DFE	PMG	MG	DFE	PMG	MG
θ_{lnP}	-0.040*** (0.000)	-0.032** (0.012)	-0.060*** (0.010)	-0.035*** (0.001)	-0.025*** (0.042)	-0.042* (0.068)	-0.032*** (0.003)	-0.018 (0.145)	-0.030 (0.170)
θ_{lnF}	0.022*** (0.002)	0.007 (0.482)	-0.023 (0.327)	0.023*** (0.001)	0.005 (0.580)	-0.021 (0.399)	0.024*** (0.001)	0.008 (0.353)	-0.019 (0.447)
θ_{lnE}	-0.046*** (0.000)	-0.100** (0.000)	-0.104*** (0.000)	-0.047*** 0.000	-0.104*** (0.000)	-0.115*** (0.000)	-0.048*** (0.000)	-0.106*** (0.000)	-0.120*** (0.000)
λ	-0.934*** (0.000)	-0.955*** (0.000)	-1.005*** (0.000)	-0.960*** (0.000)	-0.974*** (0.000)	-1.038*** (0.000)	-0.975*** (0.000)	-0.993*** (0.000)	-1.067*** (0.000)
γ	-0.023*** (0.000)	-0.029*** (0.000)	-0.040*** (0.000)	-0.023*** (0.000)	-0.031*** (0.000)	-0.043*** (0.000)	-0.023*** (0.000)	-0.031*** (0.000)	-0.045*** (0.000)
η	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.001)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
CD test statistics	229.45*** (0.000)	214.28*** (0.000)	214.28*** (0.000)	229.82*** (0.000)	212.45*** (0.000)	212.45*** (0.000)	229.50*** (0.000)	209.36*** (0.000)	209.36*** (0.000)
Hausman test statistics	6.27* (0.099) (MG vs PMG)			4.44 (0.218) (MG vs PMG)			4.80 (0.187) (MG vs PMG)		
	26.91*** (0.000) (MG vs DFE)			31.07*** (0.000) (MG vs DFE)			37.18*** (0.000) (MG vs DFE)		
AIC Criterion	-	-34430.14	-34647.74	-	-34586.58	-34817.33	-	-34744.81	-34980.16
BIC Criterion	-	-34262.18	-34479.77	-	-34388.16	-34618.92	-	-34515.96	-34751.32
Observations	15287	15287	15287	15236	15236	15236	15185	15185	15185

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table C16: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2013m10, N=51)

	CS-ARDL (p_x=p_y=1,p_z=3)			CS-ARDL(p_x=p_y=2,p_z=3)	
	PMG	MG		PMG	**MG**
θ_{lnP}	**-0.021* (0.060)**	**-0.039* (0.089)**		**-0.055*** (0.000)**	**-0.097*** (0.000)**
θ_{lnF}	**0.017** (0.041)**	0.013 (0.483)		-0.006 (0.549)	-0.007 (0.628)
θ_{lnE}	**-0.063*** (0.000)**	**-0.069*** (0.000)**		**-0.022** (0.037)**	-0.022 (0.115)
λ	**-0.847*** (0.000)**	**-0.864*** (0.000)**		**-1.043*** (0.000)**	**-1.065*** (0.000)**
γ	**-0.018*** (0.000)**	**-0.025*** (0.000)**		-0.002 (0.608)	-0.003 (0.418)
η	**0.000*** (0.000)**	**0.000*** (0.004)**		0.000 (0.507)	0.000 (0.201)
CD test statistics	**-8.23*** (0.000)**			**-8.22*** (0.000)**	
Hausman test statistics	1.82 (0.610) (MG vs PMG)			**19.50*** (0.000)** (MG vs PMG)	
AIC Criterion	-41596.38	-41836.36		-44360.44	-44549.77
BIC Criterion	-41397.82	-41637.81		-44131.24	-44320.57
Observations	15318	15318		15369	15369

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

APPENDIX-D: Results Based on Separated Time Periods

Table D1: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01, 2007m11)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**	DFE	**PMG**	MG
θ_{lnP}	**-0.029* (0.084)**	**-0.048** (0.011)**	**-0.070*** (0.010)**	-0.025 (0.137)	**-0.041** (0.028)**	**-0.065** (0.027)**	-0.026 (0.139)	**-0.046** (0.015)**	**-0.074** (0.018)**
θ_{lnF}	-0.002 (0.790)	-0.007 (0.572)	-0.033 (0.138)	0.000 (0.966)	-0.005 (0.694)	-0.025 (0.262)	-0.000 (0.978)	-0.006 (0.626)	-0.023 (0.314)
θ_{lnE}	-0.002 (0.925)	-0.021 (0.283)	-0.006 (0.805)	-0.005 (0.770)	-0.029 (0.139)	-0.011 (0.679)	-0.008 (0.682)	**-0.033* (0.094)**	-0.017 (0.563)
λ	**-0.961*** (0.000)**	**-0.973*** (0.000)**	**-0.986*** (0.000)**	**-0.983*** (0.000)**	**-0.997*** (0.000)**	**-1.022*** (0.000)**	**-0.979*** (0.000)**	**-1.004*** (0.000)**	**-1.042*** (0.000)**
η	0.000 (0.875)	0.000 (0.545)	0.000 (0.929)	0.000 (0.921)	0.000 (0.304)	0.000 (0.924)	0.000 (0.950)	0.000 (0.233)	0.000 (0.923)
CD test statistics	**124.72*** (0.000)**	**123.09*** (0.000)**	**123.09*** (0.000)**	**124.62*** (0.000)**	**121.91*** (0.000)**	**121.91*** (0.000)**	**124.54*** (0.000)**	**120.67*** (0.000)**	**120.67*** (0.000)**
Hausman test statistics	2.65 (0.449) (MG vs PMG) **6.60* (0.086)** (MG vs DFE)			1.66 (0.646) (MG vs PMG) **17.10*** (0.001)** (MG vs DFE)			1.62 (0.656) (MG vs PMG) **10.32** (0.016)** (MG vs DFE)		
AIC Criterion	-	-17654.89	-17732.34	-	-17666.17	-17748.55	-	-17686.77	-17773.29
BIC Criterion	-	-17593.85	-17671.3	-	-17578.04	-17660.43	-	-17571.6	-17658.11
Observations	6520	6520	6520	6496	6496	6496	6472	6472	6472

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D1(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01, 2007m11)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	-0.021	**-0.036***	**-0.064****	-0.014	-0.029	-0.057	-0.007	-0.022	-0.039
	(0.234)	**(0.051)**	**(0.043)**	(0.432)	(0.118)	(0.107)	(0.692)	(0.266)	(0.203)
θ_{lnF}	0.001	-0.000	-0.021	-0.003	-0.005	-0.028	-0.002	-0.002	-0.020
	(0.932)	(0.994)	(0.359)	(0.736)	(0.714)	(0.280)	(0.857)	(0.903)	(0.415)
θ_{lnE}	-0.009	**-0.037***	-0.024	-0.009	**-0.045****	-0.024	-0.010	**-0.053****	-0.036
	(0.644)	**(0.053)**	(0.412)	(0.639)	**(0.025)**	(0.397)	(0.603)	**(0.012)**	(0.196)
λ	**-0.999*****	**-1.036*****	**-1.090*****	**-0.982*****	**-1.017*****	**-1.087*****	**-0.908*****	**-0.965*****	**-1.041*****
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
η	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
	(0.943)	(0.209)	(0.935)	(0.592)	(0.186)	(0.999)	(0.427)	(0.141)	(0.158)
CD test statistics	**123.99*****	**117.31*****	**117.31*****	**123.32*****	**115.43*****	**115.43*****	**121.98*****	**114.43*****	**114.43*****
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Hausman test statistics	2.15 (0.542) (MG vs PMG)			1.80 (0.615) (MG vs PMG)			1.71 (0.634) (MG vs PMG)		
	10.73 (0.013)** (MG vs DFE)			5.75 (0.125) (MG vs DFE)			4.63 (0.201) (MG vs DFE)		
AIC Criterion	-	-17718.75	-17812.22	-	-17775.2	-17874.96	-	-17839.57	-17937.14
BIC Criterion	-	-17576.55	-17670.01	-	-17606.01	-17719.3	-	-17663.71	-17781.57
Observations	6448	6448	6448	6424	6424	6424	6400	6400	6400

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D2: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01, 2007m11)

	CS-ARDL (p_x=p_y=1, p_z=3)			CS-ARDL(p_x=p_y=2, p_z=3)	
	PMG	MG		**PMG**	MG
θ_{lnP}	**-0.032* (0.057)**	**-0.061** (0.048)**		-0.009 (0.600)	-0.011 (0.727)
θ_{lnF}	-0.010 (0.397)	-0.023 (0.277)		**-0.040*** (0.005)**	**-0.044* (0.090)**
θ_{lnE}	**-0.034** (0.049)**	-0.011 (0.697)		**-0.042** (0.015)**	-0.042 (0.221)
λ	**-0.816*** (0.000)**	**-0.835*** (0.000)**		**-1.054*** (0.000)**	**-1.082*** (0.000)**
η	0.000 (0.941)	-0.000 (0.603)		0.000 (0.922)	-0.000 (0.701)
CD test statistics	**-10.37*** (0.000)**			**-10.13*** (0.000)**	
Hausman test statistics	1.47 (0.689) (MG vs PMG)			0.03 (0.999) (MG vs PMG)	
AIC Criterion	-21496.05	-21604.58		-22826.79	-22947.85
BIC Criterion	-21326.75	-21448.82		-22650.62	-22792
Observations	6452	6452		6476	6476

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D3: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 1984m01, 2007m11)

	CS-DL (p=1, p_x=6)	CS-DL (p=2, p_x=6)	CS-DL (p=3, p_x=6)	CS-DL (p=4, p_x=6)	CS-DL (p=5, p_x=6)	CS-DL (p=6, p_x=6)
θ_{lnP}	-0.034 (0.239)	-0.024 (0.440)	-0.021 (0.550)	-0.025 (0.521)	-0.031 (0.489)	-0.023 (0.575)
θ_{lnF}	-0.029 (0.227)	**-0.042*** **(0.092)**	**-0.051*** **(0.060)**	*-0.054* *(0.102)*	**-0.062*** **(0.059)**	*-0.057* *(0.114)*
θ_{lnE}	-0.046 (0.162)	-0.038 (0.309)	-0.052 (0.168)	**-0.075**** **(0.029)**	**-0.072**** **(0.031)**	**-0.069**** **(0.039)**
η	-0.000 (0.641)	-0.000 (0.556)	-0.000 (0.609)	-0.000 (0.674)	-0.000 (0.741)	0.000 (0.997)
CD test statistics	**-10.39***** **(0.000)**	**-10.33***** **(0.000)**	**-10.25***** **(0.000)**	**-10.05***** **(0.000)**	**-9.99***** **(0.000)**	**-9.83***** **(0.000)**
Observations	6424	6424	6424	6424	6424	6424

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D4: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 2007m12-2013m10)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	0.029 (0.737)	0.108 (0.389)	0.342 (0.144)	0.083 (0.328)	0.072 (0.517)	0.313 (0.243)	0.082 (0.342)	0.141 (0.198)	0.243 (0.383)
θ_{lnF}	-0.030 (0.421)	-0.014 (0.801)	0.143 (0.233)	**-0.184*** (0.000)**	**-0.204*** (0.000)**	**-0.227* (0.098)**	**-0.196*** (0.000)**	**-0.212*** (0.000)**	**-0.221* (0.067)**
θ_{lnE}	**-0.182*** (0.000)**	**-0.196*** (0.000)**	**-0.205*** (0.000)**	**-0.177*** (0.000)**	**-0.197*** (0.000)**	**-0.233*** (0.000)**	**-0.185*** (0.000)**	**-0.201*** (0.000)**	**-0.227*** (0.000)**
λ	**-0.906*** (0.000)**	**-0.939*** (0.000)**	**-0.970*** (0.000)**	**-0.985*** (0.000)**	**-1.016*** (0.000)**	**-1.059*** (0.000)**	**-0.951*** (0.000)**	**-0.998*** (0.000)**	**-1.057*** (0.000)**
η	**0.001*** (0.000)**	**0.001*** (0.000)**	**0.001* (0.056)**	**0.001*** (0.000)**	**0.001*** (0.000)**	0.000 (0.271)	**0.001*** (0.000)**	**0.000*** (0.000)**	0.000 (0.209)
CD test statistics	**99.20*** (0.000)**	**91.61*** (0.000)**	**91.61*** (0.000)**	**89.25*** (0.000)**	**78.59*** (0.000)**	**78.59*** (0.000)**	**89.62*** (0.000)**	**73.63*** (0.000)**	**73.63*** (0.000)**
Hausman test statistics	5.79 (0.122) (MG vs PMG) 5.86 (0.119) (MG vs DFE)			1.12 (0.772) (MG vs PMG) 1.72 (0.633) (MG vs DFE)			0.29 (0.962) (MG vs PMG) 0.73 (0.865) (MG vs DFE)		
AIC Criterion	-	-3734.719	-3802.217	-	-4023.871	-4102.592	-	-4146.418	-4224.671
BIC Criterion	-	-3686.135	-3753.633	-	-20814.71	-4032.416	-	-4054.649	-4132.902
Observations	1633	1633	1633	1633	1633	1633	1633	1633	1633

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D4(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Developed Country Sample, 2007m12-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	0.075 (0.415)	**0.200* (0.074)**	0.238 (0.506)	0.064 (0.454)	**0.272** (0.013)**	0.198 (0.610)	0.088 (0.277)	**0.255** (0.011)**	0.705 (0.192)
θ_{lnF}	**-0.194*** (0.000)**	**-0.207*** (0.001)**	**-0.237* (0.081)**	**-0.164*** (0.001)**	**-0.149** (0.012)**	-0.320 (0.140)	**-0.148*** (0.001)**	**-0.153*** (0.004)**	**-0.567* (0.059)**
θ_{lnE}	**-0.189*** (0.000)**	**-0.189*** (0.000)**	**-0.265*** (0.000)**	**-0.183*** (0.000)**	**-0.184*** (0.000)**	**-0.288*** (0.001)**	**-0.175*** (0.000)**	**-0.158*** (0.000)**	**-0.198** (0.042)**
λ	**-0.907*** (0.000)**	**-0.971*** (0.000)**	**-1.042*** (0.000)**	**-0.967*** (0.000)**	**-0.996*** (0.000)**	**-1.083*** (0.000)**	**-1.113*** (0.000)**	**-1.147*** (0.000)**	**-1.237*** (0.000)**
η	**0.001*** (0.000)**	**0.001*** (0.000)**	0.000 (0.685)	**0.001*** (0.000)**	**0.001*** (0.000)**	0.000 (0.565)	**0.001*** (0.000)**	**0.001*** (0.000)**	0.000 (0.496)
CD test statistics	**89.45*** (0.000)**	**68.88*** (0.000)**	**68.88*** (0.000)**	**89.55*** (0.000)**	**65.03*** (0.000)**	**65.03*** (0.000)**	**89.38*** (0.000)**	**60.84*** (0.000)**	**60.84*** (0.000)**
Hausman test statistics	1.45 (0.694) (MG vs PMG)			1.59 (0.6614) (MG vs PMG)			2.71 (0.4384) (MG vs PMG)		
	1.36 (0.715) (MG vs DFE)			1.85 (0.6036) (MG vs DFE)			3.05 (0.3839) (MG vs DFE)		
AIC Criterion	-	-4236.385	-4324.281	-	-4362.462	-4461.977	-	-4555.328	-4673.275
BIC Criterion	-	-4123.024	-4210.919	-	-4227.507	-4343.218	-	-4420.374	-4554.515
Observations	1633	1633	1633	1633	1633	1633	1633	1633	1633

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D5: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 2007m12-2013m10)

	CS-ARDL (p_x=p_y=1, p_z=3)			CS-ARDL(p_x=p_y=2, p_z=3)	
	PMG	MG		**PMG**	MG
θ_{lnP}	0.070 (0.527)	0.031 (0.889)		0.071 (0.199)	0.066 (0.633)
θ_{lnF}	0.069 (0.226)	0.136 (0.281)		0.035 (0.266)	0.044 (0.524)
θ_{lnE}	**-0.085***** **(0.002)**	**-0.129***** **(0.028)**		-0.016 (0.513)	0.057 (0.403)
λ	**-0.630***** **(0.000)**	**-0.673***** **(0.000)**		**-1.270***** **(0.000)**	**-1.381***** **(0.000)**
η	**0.000***** **(0.000)**	0.000 (0.867)		0.000 (0.852)	-0.000 (0.771)
CD test statistics	**-4.83***** **(0.000)**			**-4.20***** **(0.000)**	
Hausman test statistics	0.88 (0.830) (MG vs PMG)			3.23 (0.358) (MG vs PMG)	
AIC Criterion	-6351.20	-6453.81		-7264.34	-7418.42
BIC Criterion	-6216.25	-6335.05		-7129.38	-7299.66
Observations	1633	1633		1633	1633

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D6: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Developed Country Sample, 2007m12-2013m10)

	CS-DL (p=1, p_x=4)	CS-DL (p=2, p_x=4)	CS-DL (p=3, p_x=4)	CS-DL (p=4, p_x=4)
θ_{lnP}	0.164 (0.191)	0.179 (0.198)	0.075 (0.606)	-0.014 (0.954)
θ_{lnF}	0.051 (0.572)	0.104 (0.178)	0.020 (0.856)	-0.068 (0.629)
θ_{lnE}	0.068 (0.380)	0.046 (0.593)	-0.008 (0.906)	0.087 (0.295)
η	0.000 (0.946)	0.000 (0.935)	0.000 (0.783)	0.000 (0.624)
CD test statistics	**-5.04***** **(0.000)**	**-4.73***** **(0.000)**	**-4.39***** **(0.000)**	**-4.02***** **(0.000)**
Observations	1633	1633	1633	1633

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D7: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2007m11)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	**DFE**	**PMG**	MG
θ_{lnP}	**-0.083*** (0.000)**	**-0.091*** (0.000)**	-0.068 (0.292)	**-0.099*** (0.000)**	**-0.103*** (0.000)**	-0.093 (0.166)	**-0.098*** (0.000)**	**-0.091*** (0.000)**	-0.091 (0.196)
θ_{lnF}	0.017 (0.311)	0.027 (0.203)	-0.002 (0.958)	**0.028* (0.077)**	**0.038* (0.072)**	0.009 (0.854)	**0.031* (0.082)**	**0.039* (0.061)**	0.017 (0.726)
θ_{lnE}	0.001 (0.971)	-0.009 (0.704)	-0.010 (0.793)	0.001 (0.949)	-0.019 (0.436)	-0.019 (0.666)	-0.003 (0.858)	-0.024 (0.315)	-0.017 (0.654)
λ	**-0.953*** (0.000)**	**-0.940*** (0.000)**	**-0.957*** (0.000)**	**-0.969*** (0.000)**	**-0.954*** (0.000)**	**-0.987*** (0.000)**	**-0.973*** (0.000)**	**-0.978*** (0.000)**	**-1.030*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**61.25*** (0.000)**	**58.24*** (0.000)**	**58.24*** (0.000)**	**61.32*** (0.000)**	**57.05*** (0.000)**	**57.05*** (0.000)**	**61.34*** (0.000)**	**55.77*** (0.000)**	**55.77*** (0.000)**
Hausman test statistics	1.79 (0.616) (MG vs PMG) 2.50 (0.476) (MG vs DFE)			1.04 (0.792) (MG vs PMG) 2.95 (0.400) (MG vs DFE)			0.66 (0.882) (MG vs PMG) 0.81 (0.846) (MG vs DFE)		
AIC Criterion	-	-7431.83	-7506.59		-7509.58	-7590.46		-7579.23	-7665.93
BIC Criterion	-	-7374.57	-7449.33		-7426.94	-7507.82		-7471.24	-7557.94
Observations	4281	4281	4281	4260	4260	4260	4239	4239	4239

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D7(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2007m11)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	**-0.084*** (0.000)**	**-0.071*** (0.002)**	-0.049 (0.514)	**-0.082*** (0.000)**	**-0.076*** (0.001)**	-0.031 (0.684)	**-0.081*** (0.000)**	**-0.066*** (0.003)**	-0.014 0.863
θ_{lnF}	0.020 (0.348)	0.028 (0.139)	0.018 (0.746)	0.028 (0.197)	**0.041** (0.033)**	0.039 (0.503)	0.030 (0.225)	**0.047** (0.015)**	0.028 (0.651)
θ_{lnE}	-0.011 (0.463)	-0.033 (0.142)	-0.025 (0.551)	-0.021 (0.132)	**-0.052** (0.026)**	-0.039 (0.344)	-0.018 (0.293)	**-0.044* (0.064)**	-0.032 (0.439)
λ	**-0.996*** (0.000)**	**-1.044*** (0.000)**	**-1.119*** (0.000)**	**-1.019*** (0.000)**	**-1.062*** (0.000)**	**-1.167*** (0.000)**	**-1.005*** (0.000)**	**-1.058*** (0.000)**	**-1.192*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.010)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.000*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**60.85*** (0.000)**	**52.97*** (0.000)**	**52.97*** (0.000)**	**61.23*** (0.000)**	**52.17*** (0.000)**	**52.17*** (0.000)**	**61.09*** (0.000)**	**51.52*** (0.000)**	**51.52*** (0.000)**
Hausman test statistics	0.75 (0.861) (MG vs PMG)			1.86 (0.602) (MG vs PMG)			2.02 (0.568) (MG vs PMG)		
	0.51 (0.917) (MG vs DFE)			0.57 (0.904) (MG vs DFE)			1.26 (0.738) (MG vs DFE)		
AIC Criterion	-	-7740.76	-7844.78	-	-7813.99	-7935.43	-	-7912.68	-8042.11
BIC Criterion	-	-7607.47	-7717.84	-	-7668.12	-7808.59	-	-7766.92	-7915.36
Observations	4218	4218	4218	4197	4197	4197		4176	4176

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D8: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2007m11)

	CS-ARDL (p_x=p_y=1,p_z=3)			CS-ARDL (p_x=p_y=2,p_z=3)	
	PMG	MG		PMG	**MG**
θ_{lnP}	**-0.065*** (0.003)**	-0.049 (0.463)		**-0.089*** (0.002)**	**-0.130*** (0.008)**
θ_{lnF}	0.030 (0.111)	0.021 (0.656)		0.005 (0.852)	0.003 (0.936)
θ_{lnE}	-0.011 (0.624)	-0.022 (0.625)		-0.013 (0.598)	-0.031 (0.403)
λ	**-0.892*** (0.000)**	**-0.914*** (0.000)**		**-1.071*** (0.000)**	**-1.100*** (0.000)**
η	**0.000*** (0.000)**	**0.000*** (0.000)**		-0.000 (0.747)	-0.000 (0.597)
CD test statistics	**-9.24*** (0.000)**			**-8.97*** (0.000)**	
Hausman test statistics	0.71 (0.871) (MG vs PMG)			**8.03** (0.045)** (MG vs PMG)	
AIC Criterion	-9172.28	-9268.44		-9770.22	-9855.61
BIC Criterion	-9026.24	-9141.45		-9624.07	-9728.52
Observations	4228	4228		4249	4249

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D9: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 1988m01-2007m11)

	CS-DL ($p=1$, $p_x=6$)	CS-DL ($p=2$, $p_x=6$)	CS-DL ($p=3$, $p_x=6$)	CS-DL ($p=4$, $p_x=6$)	CS-DL ($p=5$, $p_x=6$)	CS-DL ($p=6$, $p_x=6$)
θ_{lnP}	**-0.095**** **(0.031)**	**-0.106**** **(0.025)**	**-0.100**** **(0.030)**	**-0.121**** **(0.015)**	**-0.148***** **(0.004)**	**-0.140**** **(0.013)**
θ_{lnF}	-0.015 (0.676)	0.003 (0.945)	0.041 (0.389)	0.005 (0.934)	0.030 (0.583)	0.003 (0.963)
θ_{lnE}	-0.059 (0.185)	-0.057 (0.220)	-0.047 (0.285)	-0.041 (0.386)	-0.047 (0.342)	-0.056 (0.312)
η	-0.000 (0.537)	-0.000 (0.656)	-0.000 (0.762)	-0.000 (0.667)	-0.000 (0.453)	-0.000 (0.696)
CD test statistics	**-9.36***** **(0.000)**	**-9.21***** **(0.000)**	**-8.96***** **(0.000)**	**-8.57***** **(0.000)**	**-8.13***** **(0.000)**	**-8.01***** **(0.000)**
Observations	4197	4197	4197	4197	4197	4197

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D10: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 2007m12-2013m10)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	MG	**DFE**	**PMG**	MG	**DFE**	**PMG**	MG
θ_{lnP}	**0.156*** **(0.054)**	**0.269**** **(0.043)**	**0.259*** **(0.085)**	**0.156**** **(0.033)**	**0.235*** **(0.052)**	0.311 (0.144)	**0.156**** **(0.041)**	**0.231*** **(0.065)**	0.267 (0.298)
θ_{lnF}	0.065 (0.174)	**0.125**** **(0.041)**	-0.040 (0.865)	-0.064* (0.251)	0.027 (0.640)	-0.279 (0.409)	**-0.108**** **(0.037)**	-0.028 (0.676)	-0.274 (0.340)
θ_{lnE}	**-0.213***** **(0.000)**	**-0.256***** **(0.000)**	**-0.220***** **(0.004)**	**-0.166***** **(0.000)**	**-0.249***** **(0.000)**	**-0.181**** **(0.032)**	**-0.148***** **(0.000)**	**-0.219***** **(0.000)**	-0.128 (0.196)
λ	**-0.927***** **(0.000)**	**-0.951***** **(0.000)**	**-0.989***** **(0.000)**	**-0.990***** **(0.000)**	**-1.030***** **(0.000)**	**-1.104***** **(0.000)**	**-0.912***** **(0.000)**	**-0.960***** **(0.000)**	**-1.057***** **(0.000)**
η	**0.000***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001**** **(0.016)**
CD test statistics	**77.56***** **(0.000)**	**71.29***** **(0.000)**	**71.29***** **(0.000)**	**73.61***** **(0.000)**	**63.31***** **(0.000)**	**63.31***** **(0.000)**	**73.81***** **(0.000)**	**59.32***** **(0.000)**	**59.32***** **(0.000)**
Hausman test statistics	0.98 (0.807) (MG vs PMG) 0.82 (0.845) (MG vs DFE)			1.61 (0.656) (MG vs PMG) 0.86 (0.836) (MG vs DFE)			2.16 (0.539) (MG vs PMG) 0.49 (0.921) (MG vs DFE)		
AIC Criterion	-	-2889.27	-2961.45	-	-3027.27	-3143.56	-	-3137.90	-3239.59
BIC Criterion	-	-2841.50	-2913.69	-	-2958.28	-3074.56	-	-3047.68	-3149.37
Observations	1491	1491	1491	1491	1491	1491	1491	1491	1491

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D10(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 2007m12-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	**0.148*** (0.056)**	0.205 (0.134)	0.120 (0.562)	**0.142*** (0.077)**	0.137 (0.251)	0.182 (0.414)	0.115 (0.116)	0.035 (0.696)	0.151 (0.521)
θ_{lnF}	-0.038 (0.456)	-0.014 (0.846)	-0.305 (0.429)	0.005 (0.913)	0.034 (0.624)	-0.039 (0.890)	0.024 (0.605)	**0.109* (0.053)**	0.046 (0.840)
θ_{lnE}	**-0.154*** (0.000)**	**-0.233*** (0.000)**	-0.139 (0.216)	**-0.149*** (0.000)**	**-0.221*** (0.000)**	-0.175 (0.174)	**-0.149*** (0.000)**	**-0.238*** (0.000)**	**-0.132*** (0.250)**
λ	**-0.892*** (0.000)**	**-0.939*** (0.000)**	**-1.061*** (0.000)**	**-0.984*** (0.000)**	**-1.045*** (0.000)**	**-1.235*** (0.000)**	**-1.135*** (0.000)**	**-1.262*** (0.000)**	**-1.474*** (0.000)**
η	**0.001*** (0.000)**	**0.001*** (0.000)**	**0.001*** (0.010)**	**0.001*** (0.000)**	**0.001*** (0.000)**	**0.001*** (0.000)**	**0.000*** (0.000)**	**0.000*** (0.001)**	**0.001*** (0.005)**
CD test statistics	**72.72*** (0.000)**	**54.30*** (0.000)**	**54.30*** (0.000)**	**72.95*** (0.000)**	**51.19*** (0.000)**	**51.19*** (0.000)**	**70.83*** (0.000)**	**45.41*** (0.000)**	**45.41*** (0.000)**
Hausman test statistics	2.13 (0.546) (MG vs PMG)			0.32 (0.956) (MG vs PMG)			1.42 (0.700) (MG vs PMG)		
	0.63 (0.889) (MG vs DFE)			0.08 (0.995) (MG vs DFE)			0.09 (0.993) (MG vs DFE)		
AIC Criterion	-	-3244.40	-3352.62	-	-3370.31	-3496.11	-	-3544.48	-3682.48
BIC Criterion	-	-3132.95	-3246.48	-	-3248.24	-3389.96	-	-3422.41	-3576.34
Observations	1491	1491	1491	1491	1491	1491	1491	1491	1491

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D11: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 2007m12-2013m10)

	CS-ARDL (p_x=p_y=*1*, p_z=*3*)			CS-ARDL(p_x=p_y=*2*, p_z=*3*)	
	PMG	MG		PMG	**MG**
θ_{lnP}	0.101 (0.238)	0.170 (0.159)		-0.022 (0.675)	0.029 (0.841)
θ_{lnF}	**0.214***** **(0.000)**	**0.329**** **(0.015)**		0.053 (0.142)	**0.340*** **(0.063)**
θ_{lnE}	**-0.069**** **(0.015)**	0.000 (0.995)		0.005 (0.887)	0.043 (0.606)
λ	**-0.851***** **(0.000)**	**-0.905***** **(0.000)**		**-1.366***** **(0.000)**	**-1.498***** **(0.000)**
η	**0.000** **(0.977)**	**0.000** **(0.961)**		0.000 (0.814)	-0.000 (0.548)
CD test statistics	**-5.38*** (0.000)**			**-4.96 *** (0.000)**	
Hausman test statistics	3.47 (0.325) (MG vs PMG)			4.91 (0.179) (MG vs PMG)	
AIC Criterion	-4791.33	-4885.96		-5342.89	-5517.12
BIC Criterion	-4669.26	-4779.81		-5220.82	-5410.97
Observations	1491	1491		1491	1491

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D12: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Emerging Countries Sample, 2007m12-2013m10)

	CS-DL (p=1, p_x=4)	CS-DL (p=2, p_x=4)	CS-DL (p=3, p_x=4)	CS-DL (p=4, p_x=4)
θ_{lnP}	0.048 (0.747)	0.002 (0.989)	-0.064 (0.687)	-0.144 (0.445)
θ_{lnF}	0.187 (0.343)	0.062 (0.855)	0.230 (0.472)	0.165 (0.587)
θ_{lnE}	-0.076 (0.506)	-0.160 (0.172)	-0.059 (0.647)	-0.144 (0.348)
η	-0.000 (0.404)	-0.000 (0.583)	-0.000 (0.519)	-0.000 (0.612)
CD test statistics	**-5.21***** **(0.000)**	**-4.94***** **(0.000)**	**-4.67***** **(0.000)**	**-4.52***** **(0.000)**
Observations	1491	1491	1491	1491

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D13: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2007m11)

	ARDL(1,1,1,1)				ARDL(2,2,2,2)				ARDL(3,3,3,3)		
	DFE	**PMG**	MG		**DFE**	PMG	**MG**		**DFE**	PMG	MG
θ_{lnP}	**-0.048* (0.079)**	**-0.063* (0.065)**	3.284 (0.366)		**-0.050* (0.086)**	**-0.069* (0.058)**	0.268 (0.947)		-0.045 (0.125)	N/A	N/A
θ_{lnF}	**0.049*** (0.010)**	**0.082*** (0.010)**	0.375 (0.247)		0.046 (0.040)	0.082 (0.013)	-0.202 (0.824)		0.037 (0.141)	N/A	N/A
θ_{lnE}	**-0.072*** (0.000)**	**-0.118*** (0.001)**	-0.420 (0.175)		**-0.073*** (0.000)**	**-0.113*** (0.002)**	**0.705* (0.054)**		**-0.067*** (0.000)**	N/A	N/A
λ	**-1.026*** (0.000)**	**-0.964*** (0.000)**	**-1.051*** (0.000)**		**-0.999*** (0.000)**	**-0.913*** (0.000)**	**-1.027*** (0.000)**		**-1.038*** (0.000)**	N/A	N/A
η	**0.000*** (0.006)**	0.000 (0.503)	-0.009 (0.325)		**0.000*** (0.007)**	0.001 (0.111)	-0.017 (0.290)		**0.000*** (0.001)**	N/A	N/A
CD test statistics	**6.55*** (0.000)**	**6.21*** (0.000)**	**6.21*** (0.000)**		**6.09*** (0.000)**	**4.37*** (0.000)**	**4.37*** (0.000)**		**6.12*** (0.000)**	N/A	N/A
Hausman test statistics	2.06 (0.560) (MG vs PMG)				6.69 (0.083) (MG vs PMG)				N/A		
	2.40 (0.494) (MG vs DFE)				5.95 (0.114) (MG vs DFE)				N/A		
AIC Criterion	-	-3917.33	-3997.21			-4002.34	-4094.87			N/A	N/A
BIC Criterion	-	-3867.95	-3947.83			-3931.18	-4023.71			N/A	N/A
Observations	1784	1784	1784		1761	1761	1761		1925	N/A	N/A

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D13 (Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2007m11)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	PMG	MG	**DFE**	PMG	MG	**DFE**	PMG	MG
θ_{lnP}	**-0.048* (0.097)**	N/A	N/A	**-0.045* (0.081)**	N/A	N/A	**-0.050* (0.061)**	N/A	N/A
θ_{lnF}	0.030 (0.114)	N/A	N/A	0.033 (0.133)	N/A	N/A	**0.042* (0.065)**	N/A	N/A
θ_{lnE}	**-0.067*** (0.000)**	N/A	N/A	**-0.067*** (0.000)**	N/A	N/A	**-0.075*** (0.000)**	N/A	N/A
λ	**-1.062*** (0.000)**	N/A	N/A	**-1.092*** (0.000)**	N/A	N/A	**-1.136*** (0.000)**	N/A	N/A
η	**0.000*** (0.000)**	N/A	N/A	**0.000*** (0.000)**	N/A	N/A	**0.000*** (0.000)**	N/A	N/A
CD test statistics	**6.250*** (0.000)**	N/A	N/A	**6.772*** (0.000)**	N/A	N/A	**5.32*** (0.000)**	N/A	N/A
Hausman test statistics	N/A			N/A			N/A		
AIC Criterion	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A
BIC Criterion	-	N/A	N/A	-	N/A	N/A	-	N/A	N/A
Observations	1715	N/A	N/A	1692	N/A	N/A	1669	N/A	N/A

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D14: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2007m11)

	CS-ARDL (p_x=p_y=1, p_z=3)			CS-ARDL(p_x=p_y=2, p_z=3)	
	PMG	MG		PMG	MG
θ_{lnP}	N/A	N/A		N/A	N/A
θ_{lnF}	N/A	N/A		N/A	N/A
θ_{lnE}	N/A	N/A		N/A	N/A
λ	N/A	N/A		N/A	N/A
η	N/A	N/A		N/A	N/A
CD test statistics	N/A			N/A	
Hausman test statistics	N/A			N/A	
AIC Criterion	N/A	N/A		N/A	N/A
BIC Criterion	N/A	N/A		N/A	N/A
Observations	N/A	N/A		N/A	N/A

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D15: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 1988m01-2007m11)

	CS-DL (p=1,p_x=6)	CS-DL (p=2,p_x=6)	CS-DL (p=3,p_x=6)	CS-DL (p=4,p_x=6)	CS-DL (p=5,p_x=6)	CS-DL (p=6,p_x=6)
θ_{lnP}	-2.259 (0.232)	0.427 (0.735)	-0.847 (0.273)	-1.476 (0.195)	-1.853 (0.240)	-2.154 (0.311)
θ_{lnF}	0.342 (0.113)	-0.277 (0.585)	0.224 (0.519)	0.480 (0.256)	0.423 (0.449)	**0.88**** **(0.042)**
θ_{lnE}	0.842 (0.199)	-0.284 (0.575)	0.204 (0.493)	0.040 (0.918)	0.151 (0.770)	0.934 (0.197)
η	-0.001 (0.294)	0.001 (0.392)	0.000 (0.636)	0.001 (0.237)	0.003 (0.073)	0.003 (0.209)
CD test statistics	**-4.02***** **(0.000)**	**-3.08***** **(0.002)**	**-4.02***** **(0.000)**	**-4.06***** **(0.000)**	**-4.06***** **(0.000)**	**-4.22***** **(0.000)**
Observations	1470	1470	1434	1434	1434	1434

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D16: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 2007m12-2013m10)

	ARDL(1,1,1,1)				ARDL(2,2,2,2)				ARDL(3,3,3,3)		
	DFE	PMG	MG		**DFE**	PMG	MG		**DFE**	PMG	MG
θ_{lnP}	0.053 (0.505)	N/A	N/A		0.027 (0.738)	N/A	N/A		0.032 (0.718)	N/A	N/A
θ_{lnF}	0.054 (0.426)	N/A	N/A		-0.010 (0.864)	N/A	N/A		-0.032 (0.594)	N/A	N/A
θ_{lnE}	**-0.119*** (0.002)**	N/A	N/A		**-0.097*** (0.005)**	N/A	N/A		**-0.097*** (0.002)**	N/A	N/A
λ	**-0.797*** (0.000)**	N/A	N/A		**-0.823*** (0.000)**	N/A	N/A		**-0796*** (0.000)**	N/A	N/A
η	**0.001*** (0.000)**	N/A	N/A		**0.001*** (0.000)**	N/A	N/A		**0.001*** (0.000)**	N/A	N/A
CD test statistics	N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A
Hausman test statistics	N/A				N/A				N/A		
	N/A				N/A				N/A		
AIC Criterion	-	N/A	N/A			N/A	N/A			N/A	N/A
BIC Criterion	-	N/A	N/A			N/A	N/A			N/A	N/A
Observations	1939				1932				1925		

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D16(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 2007m12-2013m10)

	ARDL(4,4,4,4)				ARDL(5,5,5,5)				ARDL(6,6,6,6)		
	DFE	PMG	MG		**DFE**	PMG	MG		**DFE**	PMG	MG
θ_{lnP}	0.047 (0.591)	N/A	N/A		0.043 (0.641)	N/A	N/A		0.045 (0.607)	N/A	N/A
θ_{lnF}	-0.031 (0.553)	N/A	N/A		0.011 (0.839)	N/A	N/A		0.024 (0.617)	N/A	N/A
θ_{lnE}	**-0.101***** **(0.000)**	N/A	N/A		**-0.119***** **(0.001)**	N/A	N/A		**-0.118***** **(0.001)**	N/A	N/A
λ	**-0.769***** **(0.000)**	N/A	N/A		**-0.786***** **(0.000)**	N/A	N/A		**-0.876***** **(0.000)**	N/A	N/A
η	**0.001***** **(0.000)**	N/A	N/A		**0.001***** **(0.000)**	N/A	N/A		**0.001***** **(0.000)**	N/A	N/A
CD test statistics	N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A
Hausman test statistics	N/A				N/A				N/A		
	N/A				N/A				N/A		
AIC Criterion	-	N/A	N/A		-	N/A	N/A		-	N/A	N/A
BIC Criterion	-	N/A	N/A		-	N/A	N/A		-	N/A	N/A
Observations	1918	N/A	N/A		1911	N/A	N/A		1904	N/A	N/A

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

$$\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il} \text{ and } \hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$$

Table D17: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 2007m12-2013m10)

	CS-ARDL (p_x=p_y=1, p_z=3)			CS-ARDL(p_x=p_y=2, p_z=3)	
	PMG	MG		PMG	MG
θ_{lnP}	N/A	N/A		N/A	N/A
θ_{lnF}	N/A	N/A		N/A	N/A
θ_{lnE}	N/A	N/A		N/A	N/A
λ	N/A	N/A		N/A	N/A
η	N/A	N/A		N/A	N/A
CD test statistics	N/A			N/A	
Hausman test statistics	N/A			N/A	
AIC Criterion	N/A	N/A		N/A	N/A
BIC Criterion	N/A	N/A		N/A	N/A
Observations	N/A	N/A		N/A	N/A

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D18: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Frontier Countries Sample, 2007m12-2013m10)

	CS-DL ($p=1, p_x=4$)	CS-DL ($p=2, p_x=4$)	CS-DL ($p=3, p_x=4$)	CS-DL ($p=4, p_x=4$)
θ_{lnP}	**-0.544**** **(0.025)**	-0.182 (0.675)	0.568 (0.450)	-0.118 (0.795)
θ_{lnF}	0.158 (0.129)	0.040 (0.787)	0.028 (0.877)	-0.020 (0.905)
θ_{lnE}	0.009 (0.926)	-0.180 (0.109)	-0.099 (0.406)	-0.058 (0.620)
η	0.002 (0.319)	-0.002 (0.465)	-0.005 (0.373)	0.000 (0.737)
CD test statistics	**-4.60***** **(0.000)**	**-4.42***** **(0.000)**	**-3.87***** **(0.000)**	**-3.03***** **(0.002)**
Observations	1923	1923	1923	1892

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

Table D19: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2007m11)

	ARDL(1,1,1,1)			ARDL(2,2,2,2)			ARDL(3,3,3,3)		
	DFE	**PMG**	MG	DFE	**PMG**	**MG**	DFE	**PMG**	**MG**
θ_{lnP}	**-0.048*** (0.000)**	**-0.044*** (0.000)**	**-0.068** (0.021)**	**-0.054*** (0.000)**	**-0.045*** (0.000)**	**-0.078** (0.011)**	**-0.054*** (0.000)**	**-0.047*** (0.000)**	**-0.085*** (0.009)**
θ_{lnF}	**0.016** (0.039)**	0.007* (0.414)	-0.010 (0.652)	**0.020** (0.016)**	0.008 (0.371)	-0.002 (0.921)	**0.020** (0.021)**	0.008 (0.368)	0.002 (0.933)
θ_{lnE}	-0.015 (0.252)	**-0.023* (0.089)**	-0.018 (0.390)	-0.016 (0.260)	**-0.028** (0.037)**	-0.025 (0.278)	-0.017 (0.200)	**-0.031** (0.021)**	-0.029 (0.186)
λ	**-0.964*** (0.000)**	**-0.960*** (0.000)**	**-0.975*** (0.000)**	**-0.978*** (0.000)**	**-0.975*** (0.000)**	**-1.005*** (0.000)**	**-0.983*** (0.000)**	**-0.989*** (0.000)**	**-1.035*** (0.000)**
η	**0.000*** (0.004)**	**0.000*** (0.000)**	**0.000*** (0.009)**	**0.000*** (0.004)**	**0.000*** (0.000)**	**0.000*** (0.003)**	**0.000*** (0.003)**	**0.000*** (0.000)**	**0.000*** (0.005)**
CD test statistics	**156.82*** (0.000)**	**152.68*** (0.000)**	**152.68*** (0.000)**	**157.05*** (0.000)**	**150.16*** (0.000)**	**150.16*** (0.000)**	**157.32*** (0.000)**	**148.64*** (0.000)**	**148.64*** (0.000)**
Hausman test statistics	3.11 (0.376) (MG vs PMG)			5.65 (0.130) (MG vs PMG)			3.05 (0.384) (MG vs PMG)		
	5.99 (0.112) (MG vs DFE)			**19.72*** (0.000)** (MG vs DFE)			**7.12* (0.068)** (MG vs DFE)		
AIC Criterion	-	-27396.75	-27572.49	-	-27504.1	-27693.97	-	-27616.75	-27815.62
BIC Criterion	-	-27330.25	-27505.99	-	-27408.1	-27597.96	-	-27491.28	-27690.15
Observations	11959	11959	11959	11908	11908	11908	11857	11857	11857

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D19(Cont'd): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2007m11)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	PMG	MG	DFE	**PMG**	**MG**	DFE	**PMG**	MG
θ_{lnP}	**-0.049*** (0.000)**	**-0.043*** (0.000)**	**-0.063* (0.068)**	**-0.043*** (0.000)**	**-0.038*** (0.002)**	-0.045 (0.201)	**-0.041*** (0.001)**	**-0.032** (0.014)**	-0.032 (0.363)
θ_{lnF}	**0.017* (0.053)**	0.007 (0.394)	0.004 (0.871)	**0.018** (0.044)**	0.006 (0.496)	0.009 (0.739)	**0.019** (0.045)**	0.011 (0.218)	0.011 (0.707)
θ_{lnE}	**-0.021* (0.079)**	**-0.037*** (0.005)**	-0.036 (0.114)	**-0.025** (0.024)**	**-0.046*** (0.001)**	**-0.046** (0.044)**	**-0.027** (0.033)**	**-0.047*** (0.001)**	**-0.051** (0.024)**
λ	**-1.000*** (0.000)**	**-1.032*** (0.000)**	**-1.098*** (0.000)**	**-1.011*** (0.000)**	**-1.032*** (0.000)**	**-1.119*** (0.000)**	**-0.985*** (0.000)**	**-1.008*** (0.000)**	**-1.112*** (0.000)**
η	**0.000*** (0.003)**	**0.000*** (0.000)**	**0.000*** (0.005)**	**0.000*** (0.004)**	**0.000*** (0.000)**	**0.000*** (0.004)**	**0.000*** (0.006)**	**0.000*** (0.000)**	**0.000*** (0.000)**
CD test statistics	**156.43*** (0.000)**	**143.36*** (0.000)**	**143.36*** (0.000)**	**156.87*** (0.000)**	**141.40*** (0.000)**	**141.40 *** (0.000)**	**156.46*** (0.000)**	**140.67*** (0.000)**	**140.67*** (0.000)**
Hausman test statistics	0.64 (0.886) (MG vs PMG) 3.15 (0.369) (MG vs DFE)			0.11 (0.991) (MG vs PMG) 2.62 (0.455) (MG vs DFE)			0.07 (0.996) (MG vs PMG) 2.56 (0.464) (MG vs DFE)		
AIC Criterion	-	-27831.63	-28050.45	-	-27991.12	-28225.72	-	-28153.27	-28390.87
BIC Criterion	-	-27676.73	-27895.55	-	-27806.82	-28041.42	-	-27939.6	-28177.21
Observations	11806	11806	11806	11755	11755	11755	11704	11704	11704

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D20: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2007m11)

	CS-ARDL (p_x=p_y=1,p_z=3)			CS-ARDL(p_x=p_y=2,p_z=3)	
	PMG	MG		PMG	**MG**
θ_{lnP}	**-0.025**** **(0.029)**	**-0.051*** **(0.092)**		**-0.052***** **(0.000)**	**-0.102***** **(0.000)**
θ_{lnF}	0.003 (0.715)	-0.001 (0.972)		0.006 (0.566)	-0.001 (0.978)
θ_{lnE}	**-0.035***** **(0.004)**	-0.034 (0.129)		**-0.036***** **(0.006)**	**-0.040**** **(0.027)**
λ	**-0.894***** **(0.000)**	**-0.914***** **(0.000)**		**-1.048***** **(0.000)**	**-1.074***** **(0.000)**
η	**0.000***** **(0.000)**	**0.000***** **(0.007)**		0.000 (0.290)	0.000 (0.068)
CD test statistics	**-6.35***** **(0.000)**			**-6.33***** **(0.000)**	
Hausman test statistics	1.83 (0.608) (MG vs PMG)			**31.94*** (0.000)** (MG vs PMG)	
AIC Criterion	-32276.61	-32498.32		-33913.33	-34096.32
BIC Criterion	-32092.14	-32313.84		-33699.22	-33882.21
Observations	11837	11837		11888	11888

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \, \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D21: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Restricted Full Sample, 1984m01-2007m11)

	CS-DL (p=1, p_x=6)	CS-DL (p=2, p_x=6)	CS-DL (p=3, p_x=6)	CS-DL (p=4, p_x=6)	CS-DL (p=5, p_x=6)	CS-DL (p=6, p_x=6)
θ_{lnP}	**-0.081*** (0.000)**	**-0.095*** (0.000)**	**-0.092*** (0.001)**	**-0.107*** (0.001)**	**-0.108*** (0.002)**	**-0.120*** (0.001)**
θ_{lnF}	0.005 (0.848)	0.014 (0.606)	0.017 (0.576)	-0.001 (0.986)	-0.009 (0.783)	-0.012 (0.758)
θ_{lnE}	**-0.048** (0.025)**	**-0.053** (0.013)**	**-0.055** (0.016)**	**-0.051* (0.057)**	**-0.055** (0.047)**	**-0.053* (0.094)**
η	**0.000** (0.026)**	**0.000** (0.024)**	**0.000** (0.048)**	**0.000* (0.085)**	0.000 (0.108)	**0.000* (0.081)**
CD test statistics	**-6.13*** (0.000)**	**-6.27*** (0.000)**	**-6.13*** (0.000)**	**-5.96*** (0.000)**	**-5.70*** (0.000)**	**-5.34*** (0.000)**
Observations	11755	11755	11755	11755	11755	11755

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \gamma + \eta_i T + u_{it}$$

Table D22: Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 2007m12-2013m10)

	ARDL(1,1,1,1)				ARDL(2,2,2,2)				ARDL(3,3,3,3)		
	DFE	**PMG**	MG		**DFE**	**PMG**	MG		**DFE**	**PMG**	MG
θ_{lnP}	0.088 (0.122)	N/A	N/A		**0.095* (0.076)**	N/A	N/A		**0.097* (0.074)**	N/A	N/A
θ_{lnF}	0.018 (0.622)	N/A	N/A		**-0.104** (0.013)**	N/A	N/A		**-0.135*** (0.001)**	N/A	N/A
θ_{lnE}	**-0.178*** (0.000)**	N/A	N/A		**-0.150*** (0.000)**	N/A	N/A		**-0.149*** (0.000)**	N/A	N/A
λ	**-0.898*** (0.000)**	N/A	N/A		**-0.961*** (0.000)**	N/A	N/A		**-0.902*** (0.000)**	N/A	N/A
η	**0.000*** (0.000)**	N/A	N/A		**0.001*** (0.000)**	N/A	N/A		**0.001*** (0.000)**	N/A	N/A
CD test statistics	N/A	N/A	N/A		N/A	N/A	N/A			N/A	N/A
Hausman test statistics	N/A				N/A				N/A		
AIC Criterion	N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A
BIC Criterion	N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A
Observations	3481	-	-		3481	-	-		3481	-	-

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D22 (Cont’d): Dynamic Fixed Effects (DFE), Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the ARDL Approach (Disaggregated Risk Ratings, Restricted Full Sample, 2007m12-2013m10)

	ARDL(4,4,4,4)			ARDL(5,5,5,5)			ARDL(6,6,6,6)		
	DFE	**PMG**	MG	DFE	**PMG**	MG	DFE	**PMG**	MG
θ_{lnP}	0.088 (0.113)	N/A	N/A	**0.091* (0.092)**	N/A	N/A	**0.092* (0.072)**	N/A	N/A
θ_{lnF}	**-0.110*** (0.008)**	N/A	N/A	**-0.082** (0.032)**	N/A	N/A	**-0.066* (0.080)**	N/A	N/A
θ_{lnE}	**-0.154*** (0.000)**	N/A	N/A	**-0.148*** (0.000)**	N/A	N/A	**-0.143*** (0.000)**	N/A	N/A
λ	**-0.868*** (0.000)**	N/A	N/A	**-0.939*** (0.000)**	N/A	N/A	**-1.063*** (0.000)**	N/A	N/A
η	**0.001*** (0.000)**	N/A	N/A	**0.001*** (0.000)**	N/A	N/A	**0.001*** (0.000)**	N/A	N/A
CD test statistics	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hausman test statistics	N/A			N/A			N/A		
AIC Criterion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIC Criterion	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Observations	3481	-	-	3481	-	-	3481	-	-

Notes: The ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D23: Pooled Mean Group (PMG) and Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented ARDL (CS-ARDL) Approach (Disaggregated Risk Ratings, Full Sample, 2007m12-2013m10)

	CS-ARDL (p_x=p_y=1; p_z=3)			CS-ARDL(p_x=p_y=2; p_z=3)	
	PMG	MG		PMG	MG
θ_{lnP}	N/A	N/A		N/A	N/A
θ_{lnF}	N/A	N/A		N/A	N/A
θ_{lnE}	N/A	N/A		N/A	N/A
λ	N/A	N/A		N/A	N/A
η	N/A	N/A		N/A	N/A
CD test statistics	N/A			N/A	
Hausman test statistics					
AIC Criterion	N/A	N/A		N/A	N/A
BIC Criterion	N/A	N/A		N/A	N/A
Observations	N/A	N/A		N/A	N/A

Notes: The cross-sectionally augmented ARDL specification is given by:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il}{}' \bar{z}_{t-l} + \eta_i T + u_{it}$$

where, $\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$ and $\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$

Table D24: Mean Group (MG) Estimates of the Long-Run Effects Based on the Cross-Sectionally Augmented Distributed Lag (CS-DL) Approach (Disaggregated Risk Ratings, Restricted Full Sample, 2007m12-2013m10)

	CS-DL (p=1, px=4)	CS-DL (p=2, px=4)	CS-DL (p=3, px=4)	CS-DL (p=4, px=4)
θ_{lnP}	0.035 (0.722)	-0.001 (0.922)	-0.095 (0.386)	-0.106 (0.504)
θ_{lnF}	**0.242**** **(0.011)**	**0.230*** **(0.100)**	**0.299**** **(0.026)**	0.168 (0.216)
θ_{lnE}	-0.008 (0.894)	-0.044 (0.455)	-0.073 (0.335)	-0.015 (0.866)
η	-0.000 (0.488)	-0.000 (0.594)	0.000 (0.972)	-0.000 (0.924)
CD test statistics	**-4.42***** **(0.000)**	**-4.47***** **(0.000)**	**-4.22***** **(0.000)**	**-3.78***** **(0.000)**
Observations	3479	3479	3479	3479

Notes: The cross-sectionally augmented DL specification is given by:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il} \bar{x}_{t-l} + \eta_i T + u_{it}$$

APPENDIX-E: The List of Countries

Table E1: The List of Countries in Each Sample

DEVELOPED			EMERGING			FRONTIER	
Group Size	**24**		**Group Size**	**21**		**Group Size**	**30**
Max. # of Observations	**358**		**Max. # of Observations**	**310**		**Max. # of Observations**	**310**
MAX [INT(T^(1/3))]	**7**		**MAX [INT(T^(1/3))]**	**6**		**MAX [INT(T^(1/3))]**	**6**
Country	**Data From**		**Country**	**Data From**		**Country**	**Data From**
Australia	01-Jan-84		Brazil	01-Jan-88		Argentina	01-Jan-88
Austria	01-Jan-84		Chile	01-Jan-88		Jordan	01-Jan-88
Belgium	01-Jan-84		Greece	01-Jan-88		Sri Lanka	01-Jan-93
Canada	01-Jan-84		Indonesia	01-Jan-88		Pakistan	01-Jan-93
Denmark	01-Jan-84		Malaysia	01-Jan-88		Morocco	01-Jan-95
Finland	01-Jan-84		Mexico	01-Jan-88		Croatia	01-Jun-02
France	01-Jan-84		Philippines	01-Jan-88		Estonia	01-Jun-02
Germany	01-Jan-84		Korea	01-Jan-88		Kenya	01-Jun-02
Hongkong	01-Jan-84		Taiwan	01-Jan-88		Nigeria	01-Jun-02
Ireland	01-Jan-88		Thailand	01-Jan-88		Slovenia	01-Jun-02
Israel	01-Jan-93		Turkey	01-Jan-88		Tunusia	01-Jun-04
Italy	01-Jan-84		China	01-Jan-93		Bahrain	01-Jun-05
Japan	01-Jan-84		Colombia	01-Jan-93		Bulgaria	01-Jun-05
Luxemburg	01-Jan-88		India	01-Jan-93		Kuwait	01-Jun-05
Netherlands	01-Jan-84		Peru	01-Jan-93		Oman	01-Jun-05
Newzealand	01-Jan-84		Poland	01-Jan-93		UAE	01-Jun-05
Norway	01-Jan-84		South Africa	01-Jan-93		Saudi Arabia	01-Jun-05
Portugal	01-Jan-88		CzechRep	01-Jan-95		Qatar	01-Jun-05
Singapore	01-Jan-84		Egypt	01-Jan-95		Kazakhstan	01-Dec-05
Spain	01-Jan-84		Hungary	01-Jan-95		Romania	01-Dec-05
Sweden	01-Jan-84		Russia	01-Jan-95		Ukraine	01-Jun-06
Switzerland	01-Jan-84					Vietnam	01-Dec-06
UK	01-Jan-84					Lithuania	01-Jun-08
USA	01-Jan-84					Serbia	01-Jun-08
						Ghana	01-Dec-08
						Jamaica	01-Dec-08
						Trinidad&Tobago	01-Dec-08
						Bangladesh	01-Dec-09
						Zimbabwe	01-Dec-10
						Venezuela	01-Jan-93

Note: For all samples, data ends on October, 2013, except Venezuela, for which data ends on Jan 2008.

APPENDIX-F:Summary Statistics

Table F1: Summary Statistics of Variables

Australia					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	84.13547	3.841459	74	90
Financial Risk	358	38.19413	4.438581	27.5	46
Economic Risk	358	38.77324	2.121424	34.5	43.5
Composite Risk	358	80.55145	2.285979	75.5	87
MSCI Index	358	411.3066	256.8463	90.92899	1127.442

Austria					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	86.53352	2.854108	78	93
Financial Risk	358	42.93575	3.936478	34	49
Economic Risk	358	39.98925	1.740255	36	44
Composite Risk	358	84.72925	2.634901	76.75	89.75
MSCI Index	358	1110.776	737.3443	133.75	3643.016
Belgium					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	81.33101	3.001412	74	87.5
Financial Risk	358	41.81006	3.515904	34	48
Economic Risk	358	39.89581	2.690256	34.5	44.5
Composite Risk	358	81.51844	2.50603	74.75	87.75
MSCI Index	358	971.0958	515.0464	123.125	2436.59
Canada					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	84.96508	2.915627	78	91
Financial Risk	358	42.70391	3.326582	36.5	48
Economic Risk	358	40.10511	2.238407	35.5	44.5
Composite Risk	358	83.88704	1.627943	79.5	87.75
MSCI Index	358	789.1184	548.2482	198.257	2081.501

Table F1: Summary Statistics of Variables (Cont'd)

Denmark					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	86.29469	3.679818	77.5	94
Financial Risk	358	43.01536	2.800143	34.5	48
Economic Risk	358	40.46869	2.876665	33.5	44.5
Composite Risk	358	84.88936	2.397217	80.25	90.25
MSCI Index	358	2243.411	1838.101	236.265	6807.946
Finland					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	90.01117	4.100781	81	96
Financial Risk	358	39.77933	3.665483	32.5	44
Economic Risk	358	39.88955	4.903739	30	47.5
Composite Risk	358	84.84003	3.069398	78.75	90.5
MSCI Index	358	322.1541	271.5553	22.14	1235.872
France					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	78.60056	2.776643	69.5	85
Financial Risk	358	40.94972	3.500738	33.5	48
Economic Risk	358	38.49017	2.802274	31	44
Composite Risk	358	79.0202	2.991163	70.5	85
MSCI Index	358	980.1059	554.7696	104.742	2312.514
Germany					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	84.11313	3.297639	73	89
Financial Risk	358	43.97207	4.202747	35	50
Economic Risk	358	40.95263	2.021601	33.5	47.5
Composite Risk	358	84.51891	2.803526	78.75	91
MSCI Index	358	1038.042	558.4932	146.806	2520.744

Table F1: Summary Statistics of Variables (Cont'd)

Hongkong					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	73.97207	7.393543	52	84
Financial Risk	358	42.14804	2.799637	36	46
Economic Risk	358	41.50053	4.10237	27.5	48
Composite Risk	358	78.81034	5.70706	61.5	86
MSCI Index	358	4482.968	2517.226	397.597	10415.73
Ireland					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	83.99839	5.644469	72	92.5
Financial Risk	310	40.18065	3.564425	29.5	45
Economic Risk	310	39.414	4.507644	27	46
Composite Risk	310	81.79652	5.308765	71	90
MSCI Index	310	240.557	121.906	91.37202	603.6
Israel					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	64.024	3.542545	55	72
Financial Risk	250	39.51	1.523214	35.5	43
Economic Risk	250	38.4072	2.592329	32.5	43.5
Composite Risk	250	70.9706	2.547319	63.67	74.75
MSCI Index	250	160.6446	61.53451	67.72301	302.4101
Italy					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	76.62709	4.452352	66	86
Financial Risk	358	40.50698	3.692385	32	47
Economic Risk	358	37.63324	2.406498	31	43
Composite Risk	358	77.38369	3.206625	69.75	84.5
MSCI Index	358	302.1541	138.0478	51.679	684.2659

Table F1: Summary Statistics of Variables (Cont'd)

Japan					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	83.06983	4.236117	75	94
Financial Risk	358	46.85335	2.573323	37.5	50
Economic Risk	358	40.5845	2.853804	32	47.5
Composite Risk	358	85.25383	3.445099	75.75	92
MSCI Index	358	2531.61	766.241	635.81	4149.234
Luxembourg					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	171	92.1345	1.872253	88	95
Financial Risk	171	47.0614	3.046314	38	49
Economic Risk	171	41.2469	3.805356	35.5	47.5
Composite Risk	171	90.22146	1.265822	87.5	94
MSCI Index	171	270.4046	138.0832	92.46601	853.3712
Nedherlands					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	87.58799	4.08076	80.5	97
Financial Risk	358	42.46648	4.200539	33.5	48
Economic Risk	358	41.56972	2.151654	34	45.5
Composite Risk	358	85.81209	2.986963	77	92.25
MSCI Index	358	1359.106	733.0302	178.84	3018.016

Newzealand					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	86.52654	3.523231	77	91.5
Financial Risk	358	37.93156	6.831418	25.5	47
Economic Risk	358	37.50922	2.738119	31.5	42.5
Composite Risk	358	80.98366	2.451553	74.5	86.75
MSCI Index	358	95.38535	30.63966	34.797	189.302

Table F1: Summary Statistics of Variables (Cont'd)

Norway					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	87.05028	3.29782	78	94
Financial Risk	358	46.48603	1.087142	42	49
Economic Risk	358	44.79321	2.796806	38	49.5
Composite Risk	358	89.16475	2.543218	84	93.5
MSCI Index	358	1466.418	1014.538	278.3521	4581.033
Portugal					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	80.09677	7.12455	68	91
Financial Risk	310	37.80645	4.348636	27.5	44
Economic Risk	310	36.78697	3.471635	28.5	42.5
Composite Risk	310	77.3451	4.31469	67.5	88
MSCI Index	310	109.57	41.44989	50.064	243.534
Singapore					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	82.98464	3.952507	75	90
Financial Risk	358	44.77793	2.870255	38	49
Economic Risk	358	43.45707	3.967619	35.5	50
Composite Risk	358	85.60983	4.041604	76.25	92.5
MSCI Index	358	2119.546	1079.699	443.1291	4574.921
Spain					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	74.67458	5.043047	64	84
Financial Risk	358	38.66341	3.199129	30.5	43
Economic Risk	358	37.27592	2.755895	31	42
Composite Risk	358	75.30696	4.144982	65.5	82.5
MSCI Index	358	304.6115	201.0321	26.093	890.1602

Table F1: Summary Statistics of Variables (Cont'd)

Sweden					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	87.0405	3.6126	78	93.5
Financial Risk	358	41.12151	3.749123	30.5	47
Economic Risk	358	40.89704	3.549862	34.5	47.5
Composite Risk	358	84.5295	2.129875	77.75	88.5
MSCI Index	358	3054.792	2255.224	247.219	7886.615
Switzerland					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	89.51257	3.477899	84	97
Financial Risk	358	47.37989	2.566393	41	50
Economic Risk	358	43.34363	1.82917	37.5	46.5
Composite Risk	358	90.11804	2.510697	83.75	95.75
MSCI Index	358	2010.003	1335.107	190.618	4971.583
UK					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	82.40782	4.676498	74	92.5
Financial Risk	358	42.46508	5.021191	32.5	50
Economic Risk	358	36.89092	2.738287	29	42.5
Composite Risk	358	80.8819	3.466788	72.25	87.75
MSCI Index	358	837.1299	377.9362	157.183	1707.158
USA					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	358	82.80168	3.967451	74	95
Financial Risk	358	40.63966	7.410723	28	49
Economic Risk	358	38.02377	2.194449	30.5	42
Composite Risk	358	80.73257	4.349978	72.75	91.25
MSCI Index	358	793.9108	438.3267	143.721	1631.217

Table F1: Summary Statistics of Variables (Cont'd)

Brazil					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	66.20968	2.334053	60	71
Financial Risk	310	34.20968	4.781596	23.5	45.5
Economic Risk	310	31.95206	5.79674	18.5	41
Composite Risk	310	66.18571	4.95987	54.5	77.25
MSCI Index	310	1268.28	1168.231	84.09	4627.269
Chile					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	73.84194	6.964718	55	83
Financial Risk	310	39.4371	2.365148	34	43
Economic Risk	310	38.23026	4.109492	28	45
Composite Risk	310	75.75465	5.57411	59.75	83.5
MSCI Index	310	1022.338	730.0163	91.89399	2941.957
China					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	66.402	3.45676	58.5	75
Financial Risk	250	44.678	3.364013	38	48.5
Economic Risk	250	38.87376	2.734933	29	42
Composite Risk	250	74.97688	2.834674	67	80.5
MSCI Index	250	50.27356	24.80129	13.629	132.401
Colombia					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	56.176	4.745006	43	63
Financial Risk	250	37.482	2.870826	30	42
Economic Risk	250	34.40604	2.589608	23.9	38.5
Composite Risk	250	64.03204	4.407543	52.65	69.75
MSCI Index	250	387.5833	398.319	42.126	1393.461

Table F1: Summary Statistics of Variables (Cont'd)

Czech Republic					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	78.79204	2.754976	73	87
Financial Risk	226	39.09956	2.301217	32	45
Economic Risk	226	36.29221	2.573435	31.27	42
Composite Risk	226	77.09195	2.880304	71.75	85
MSCI Index	226	293.7802	230.1077	54.408	908.2569

Czech Republic					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	78.79204	2.754976	73	87
Financial Risk	226	39.09956	2.301217	32	45
Economic Risk	226	36.29221	2.573435	31.27	42
Composite Risk	226	77.09195	2.880304	71.75	85
MSCI Index	226	293.7802	230.1077	54.408	908.2569

Egypt					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	60.54867	5.228964	46	66.5
Financial Risk	226	39.73009	2.209611	34	43.5
Economic Risk	226	34.18265	3.50675	26	41
Composite Risk	226	67.23075	3.725315	56	72.5
MSCI Index	226	425.0213	340.0908	68.33601	1452.872

Greece					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	72.45484	6.609268	58	84
Financial Risk	310	33.53226	2.775399	25.5	39
Economic Risk	310	33.96845	4.098767	25	40.5
Composite Risk	310	69.97777	5.952521	59.25	79.25
MSCI Index	310	361.984	228.3584	57.511	1036.082

Table F1: Summary Statistics of Variables (Cont'd)

Hungary					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	78.71681	3.849315	71.5	87
Financial Risk	226	35.19912	3.018859	28	41
Economic Risk	226	33.95031	2.211908	28	40.5
Composite Risk	226	73.93314	3.126853	66.25	80.75
MSCI Index	226	474.462	293.8063	77.807	1236.049
India					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	60.416	3.694257	50	69
Financial Risk	250	40.528	3.16501	34	45
Economic Risk	250	33.93328	1.81446	28.5	37.5
Composite Risk	250	67.43864	3.156825	56.25	72.5
MSCI Index	250	233.1788	156.6934	73.966	669.9529
Indonesia					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	54.34032	7.855562	39	67
Financial Risk	310	36.31613	6.267892	18	44
Economic Risk	310	34.99316	4.23841	18	38.5
Composite Risk	310	62.82481	8.012786	41	72.25
MSCI Index	310	422.4032	263.5599	47.245	1025.33
Malaysia					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	71.6	5.136455	57	82
Financial Risk	310	41.35645	4.062163	26	45
Economic Risk	310	40.22232	2.698172	30.5	44
Composite Risk	310	76.58939	4.458488	62.5	83.25
MSCI Index	310	263.4734	115.9284	55.27001	511.2981

Table F1: Summary Statistics of Variables (Cont'd)

Mexico					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	69.93548	2.863513	63	77.5
Financial Risk	310	38.03226	4.222063	26	44
Economic Risk	310	33.93161	4.099692	23	40
Composite Risk	310	70.94968	4.371125	57.75	78.25
MSCI Index	310	2600.511	2135.987	100	7639.881
Peru					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	61.022	4.86675	44	72.5
Financial Risk	250	38.132	4.039784	25	44
Economic Risk	250	35.98772	4.031103	21.5	42
Composite Risk	250	67.57084	5.93866	45.75	74.5
MSCI Index	250	565.1394	515.734	82.57199	1823.33
Philippines					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	59.80806	10.17124	33	76
Financial Risk	310	35.21774	6.432133	20	45
Economic Risk	310	35.29832	3.367343	27	40
Composite Risk	310	65.16206	9.173146	40.75	76.5
MSCI Index	310	285.7107	162.3794	80.03999	697.6021
Poland					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	77.936	3.593544	69	87
Financial Risk	250	37.688	2.651183	28.5	41.5
Economic Risk	250	36.11652	1.585635	33	40
Composite Risk	250	75.87024	2.397997	70	82.75
MSCI Index	250	671.7511	320.3723	100	1645.788

Table F1: Summary Statistics of Variables (Cont'd)

Russia					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	61.43805	5.839381	42	69
Financial Risk	226	39.52434	6.690496	22	47.5
Economic Risk	226	37.12876	6.800844	16	45.5
Composite Risk	226	69.04558	8.029288	45	80
MSCI Index	226	542.9034	389.411	32.917	1599.848
South Africa					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	68.642	3.603997	61.5	77
Financial Risk	250	38	2.033356	31.5	42
Economic Risk	250	35.51832	2.017594	29	38.5
Composite Risk	250	71.08012	2.654722	66.44	76.5
MSCI Index	250	295.385	151.5037	100	625.696
Korea					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	74.70968	5.028196	61	83
Financial Risk	310	42.6629	4.19181	28	48
Economic Risk	310	40.33113	3.007725	30	44.5
Composite Risk	310	78.85184	3.391846	67.5	84.75
MSCI Index	310	204.4679	112.4631	35.075	488.201
Taiwan					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	77.70484	2.501289	71	83
Financial Risk	310	46.43226	1.982184	39.5	49
Economic Risk	310	42.48555	2.095307	33.5	45
Composite Risk	310	83.31132	1.642709	78.25	87.25
MSCI Index	310	251.9276	68.04351	100	523.2001

Table F1: Summary Statistics of Variables (Cont'd)

Thailand					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	63.91419	6.361616	53	79
Financial Risk	310	40.71452	3.349146	23	44
Economic Risk	310	37.73294	3.028578	26	43.5
Composite Risk	310	71.18081	4.138748	60.75	81
MSCI Index	310	243.1407	142.2027	45.072	625.2391
Turkey					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	57.60645	6.981364	39	70.5
Financial Risk	310	30.60323	5.55298	19	38
Economic Risk	310	29.6391	3.918799	17.5	36
Composite Risk	310	58.92439	6.796321	42	68.75
MSCI Index	310	282.4494	185.6107	36.162	784.2951
Argentina					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	67.67742	5.98224	54.5	77.5
Financial Risk	310	32.1371	7.254487	15.5	41.5
Economic Risk	310	33.15129	7.682051	12.5	42
Composite Risk	310	66.4829	8.974417	44	76.25
MSCI Index	310	1419.841	844.5312	87.69898	4108.081
Jordan					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	310	65.25	10.80384	34	76
Financial Risk	310	35.24839	6.817993	18	44
Economic Risk	310	34.70887	3.948851	24.5	40
Composite Risk	310	67.60365	9.023212	42.25	76.09
MSCI Index	310	115.053	64.68156	53.883	356.97

Table F1: Summary Statistics of Variables (Cont'd)

Morocco					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	226	69.75442	2.507873	63.5	74
Financial Risk	226	39.29204	2.123127	33	43
Economic Risk	226	35.47243	2.194242	29.5	38.5
Composite Risk	226	72.25947	2.308925	66	77
MSCI Index	226	277.0989	141.1654	100	682.174
Pakistan					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	49.002	5.344272	40	65
Financial Risk	250	34.898	4.025845	25.5	42.5
Economic Risk	250	31.93328	2.368293	27	37.5
Composite Risk	250	57.91664	3.112425	50.75	64.25
MSCI Index	250	95.40861	42.64339	25.531	206.253
Srilanka					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	250	55.932	4.183705	40	66
Financial Risk	250	35.724	1.953738	31.5	40
Economic Risk	250	32.4918	2.431127	22	38
Composite Risk	250	62.07388	2.574957	54	69.25
MSCI Index	250	126.1728	64.33451	27.367	326.343
Venezuela					
Variable	Obs	Mean	Std. Dev.	Min	Max
Political Risk	181	58.02486	6.528628	44.5	68
Financial Risk	181	38.61326	4.064705	32.5	47
Economic Risk	181	33.75867	4.448937	25	41.5
Composite Risk	181	65.19834	4.074204	53.75	72
MSCI Index	181	123.0732	38.9292	60.54699	269.875

APPENDIX-G:Correlations

Table G1: Correlations Among Variables

Australia					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.02	1			
ΔPolitical Risk	-0.0369	0.6436	1		
ΔFinancial Risk	0.1015	0.583	0.0317	1	
ΔEconomic Risk	-0.0238	0.5023	-0.0137	-0.008	1
Austria					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0105	1			
ΔPolitical Risk	0.02	0.6734	1		
ΔFinancial Risk	0.0861	0.5843	-0.0078	1	
ΔEconomic Risk	-0.1138	0.5112	0.013	0.1035	1
Belgium					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0888	1			
ΔPolitical Risk	0.0334	0.6221	1		
ΔFinancial Risk	0.0956	0.6866	0.0254	1	
ΔEconomic Risk	0.027	0.4958	-0.0302	0.1782	1
Canada					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1455	1			
ΔPolitical Risk	0.0189	0.6364	1		
ΔFinancial Risk	0.1762	0.519	0.0143	1	
ΔEconomic Risk	0.0523	0.495	-0.0427	-0.1023	1

Table G1: Correlations Among Variables (Cont'd)

Denmark					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.2179	1			
ΔPolitical Risk	0.1091	0.5515	1		
ΔFinancial Risk	0.1779	0.6447	0.0543	1	
ΔEconomic Risk	0.1024	0.5906	0.0129	0.0382	1
Finland					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1203	1			
ΔPolitical Risk	0.023	0.4767	1		
ΔFinancial Risk	0.073	0.5938	-0.022	1	
ΔEconomic Risk	0.1006	0.7074	0.0076	0.122	1
France					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0463	1			
ΔPolitical Risk	-0.0601	0.6879	1		
ΔFinancial Risk	0.0224	0.6064	0.0497	1	
ΔEconomic Risk	-0.0471	0.3289	-0.0399	-0.146	1
Germany					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1293	1			
ΔPolitical Risk	0.1003	0.5369	1		
ΔFinancial Risk	0.0882	0.6235	0.0765	1	
ΔEconomic Risk	0.0496	0.609	-0.0411	0.0409	1

Table G1: Correlations Among Variables (Cont'd)

Hongkong					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0174	1			
ΔPolitical Risk	0.0473	0.5876	1		
ΔFinancial Risk	0.0949	0.2803	0.1646	1	
ΔEconomic Risk	-0.03	0.8087	0.0356	0.017	1
Ireland					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0014	1			
ΔPolitical Risk	-0.0947	0.698	1		
ΔFinancial Risk	0.0264	0.3616	-0.0082	1	
ΔEconomic Risk	0.0783	0.6341	0.1324	-0.1574	1
Israel					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0721	1			
ΔPolitical Risk	0.0251	0.7634	1		
ΔFinancial Risk	0.0234	0.3083	-0.0312	1	
ΔEconomic Risk	0.0833	0.6441	0.1308	-0.016	1
Italy					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0163	1			
ΔPolitical Risk	0.0366	0.6486	1		
ΔFinancial Risk	0.0595	0.5399	-0.0286	1	
ΔEconomic Risk	-0.0743	0.5013	-0.0823	0.0791	1

Table G1: Correlations Among Variables (Cont'd)

Japan					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.056	1			
ΔPolitical Risk	-0.0943	0.6531	1		
ΔFinancial Risk	-0.0253	0.5264	-0.0447	1	
ΔEconomic Risk	0.0279	0.6476	0.0057	0.2701	1
Luxembourg					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0062	1			
ΔPolitical Risk	0.0051	0.3886	1		
ΔFinancial Risk	0.0105	0.5846	0.0414	1	
ΔEconomic Risk	-0.0048	0.6688	-0.0976	-0.0262	1
Netherlands					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0753	1			
ΔPolitical Risk	-0.0225	0.4366	1		
ΔFinancial Risk	0.1427	0.6259	0.07	1	
ΔEconomic Risk	-0.0018	0.5793	-0.1454	-0.046	1
Newzealand					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.05	1			
ΔPolitical Risk	0.0492	0.5272	1		
ΔFinancial Risk	-0.0111	0.6633	0.1171	1	
ΔEconomic Risk	0.0341	0.4904	-0.1018	-0.0778	1

Table G1: Correlations Among Variables (Cont'd)

Norway					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0537	1			
ΔPolitical Risk	0.0361	0.7223	1		
ΔFinancial Risk	0.0036	0.4417	-0.0711	1	
ΔEconomic Risk	0.0441	0.3504	-0.2269	0.1102	1
Portugal					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0356	1			
ΔPolitical Risk	-0.0116	0.5928	1		
ΔFinancial Risk	0.0773	0.669	0.0261	1	
ΔEconomic Risk	0.0046	0.6543	0.098	0.2216	1
Singapore					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0047	1			
ΔPolitical Risk	-0.0316	0.4564	1		
ΔFinancial Risk	0.0922	0.3039	0.1124	1	
ΔEconomic Risk	-0.0201	0.8447	-0.003	-0.022	1
Spain					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0638	1			
ΔPolitical Risk	0.0066	0.7273	1		
ΔFinancial Risk	0.1328	0.523	0.0464	1	
ΔEconomic Risk	0.009	0.5799	0.0507	0.1434	1

Table G1: Correlations Among Variables (Cont'd)

Sweden					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1023	1			
ΔPolitical Risk	0.135	0.6391	1		
ΔFinancial Risk	0.0974	0.5531	0.1848	1	
ΔEconomic Risk	-0.018	0.6279	0.1353	-0.1341	1
Switzerland					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0671	1			
ΔPolitical Risk	-0.0086	0.374	1		
ΔFinancial Risk	0.114	0.604	-0.0491	1	
ΔEconomic Risk	0.0033	0.6305	-0.1735	0.041	1
UK					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0124	1			
ΔPolitical Risk	-0.008	0.7036	1		
ΔFinancial Risk	0.043	0.5558	0.0032	1	
ΔEconomic Risk	-0.0769	0.3424	0.0407	-0.2133	1
USA					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0652	1			
ΔPolitical Risk	0.0938	0.6281	1		
ΔFinancial Risk	0.06	0.6403	0.0223	1	
ΔEconomic Risk	-0.0699	0.4241	-0.008	-0.0407	1

Table G1: Correlations Among Variables (Cont'd)

Brazil					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.091	1			
ΔPolitical Risk	0.1051	0.5004	1		
ΔFinancial Risk	0.0145	0.6253	-0.0822	1	
ΔEconomic Risk	0.0225	0.5841	-0.0147	0.0818	1
Chile					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0044	1			
ΔPolitical Risk	0.0431	0.518	1		
ΔFinancial Risk	-0.0048	0.4471	0.0276	1	
ΔEconomic Risk	-0.0363	0.7547	-0.007	0.0526	1
China					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0344	1			
ΔPolitical Risk	-0.0042	0.7738	1		
ΔFinancial Risk	-0.054	0.3229	0.0451	1	
ΔEconomic Risk	0.1015	0.5962	0.1044	-0.1271	1
Colombia					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0005	1			
ΔPolitical Risk	0.0531	0.8198	1		
ΔFinancial Risk	-0.029	0.5435	0.1785	1	
ΔEconomic Risk	-0.0527	0.4854	0.106	0.0088	1

Table G1: Correlations Among Variables (Cont'd)

Czech Republic					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0565	1			
ΔPolitical Risk	-0.0316	0.4959	1		
ΔFinancial Risk	-0.073	0.7465	-0.0563	1	
ΔEconomic Risk	0.0106	0.6326	-0.0012	0.3446	1
Egypt					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1354	1			
ΔPolitical Risk	0.0372	0.5631	1		
ΔFinancial Risk	0.1409	0.6291	0.075	1	
ΔEconomic Risk	0.0769	0.6105	-0.0484	0.1062	1
Greece					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0092	1			
ΔPolitical Risk	-0.0191	0.6167	1		
ΔFinancial Risk	0.0705	0.7491	0.1239	1	
ΔEconomic Risk	-0.0481	0.6653	0.1418	0.312	1
Hungary					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0467	1			
ΔPolitical Risk	-0.0392	0.5835	1		
ΔFinancial Risk	0.0424	0.5852	0.0234	1	
ΔEconomic Risk	-0.0859	0.7057	0.1532	0.0911	1

Table G1: Correlations Among Variables (Cont'd)

India					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0994	1			
ΔPolitical Risk	0.0217	0.8415	1		
ΔFinancial Risk	0.1159	0.4572	0.1535	1	
ΔEconomic Risk	0.1042	0.5754	0.1756	0.0547	1
Indonesia					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1144	1			
ΔPolitical Risk	0.0106	0.6289	1		
ΔFinancial Risk	0.069	0.7251	0.195	1	
ΔEconomic Risk	0.164	0.5675	0.0434	0.1263	1
Malaysia					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0552	1			
ΔPolitical Risk	-0.0728	0.5508	1		
ΔFinancial Risk	0.201	0.5312	0.0226	1	
ΔEconomic Risk	-0.0092	0.728	0.079	0.0726	1
Mexico					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1785	1			
ΔPolitical Risk	0.1491	0.6331	1		
ΔFinancial Risk	0.1096	0.5833	0.1523	1	
ΔEconomic Risk	0.0735	0.6798	0.1157	0.0502	1

Table G1: Correlations Among Variables (Cont'd)

Peru					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1099	1			
ΔPolitical Risk	0.0393	0.7002	1		
ΔFinancial Risk	-0.0086	0.5378	0.082	1	
ΔEconomic Risk	0.1702	0.5399	-0.0322	0.0786	1
Philippines					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0445	1			
ΔPolitical Risk	-0.0573	0.8178	1		
ΔFinancial Risk	-0.0406	0.6861	0.3294	1	
ΔEconomic Risk	0.0195	0.4587	0.0455	0.1445	1
Poland					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.1453	1			
ΔPolitical Risk	-0.1982	0.5825	1		
ΔFinancial Risk	0.0209	0.6909	-0.0079	1	
ΔEconomic Risk	-0.0997	0.48	-0.0008	0.0922	1
Russia					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0605	1			
ΔPolitical Risk	0.1952	0.5429	1		
ΔFinancial Risk	-0.0408	0.7325	0.1754	1	
ΔEconomic Risk	-0.0399	0.7691	0.0155	0.4375	1

Table G1: Correlations Among Variables (Cont'd)

South Africa					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0896	1			
ΔPolitical Risk	-0.1157	0.6363	1		
ΔFinancial Risk	-0.0212	0.695	0.0845	1	
ΔEconomic Risk	-0.0163	0.5196	0.054	0.1034	1
Korea					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0062	1			
ΔPolitical Risk	-0.0062	0.5661	1		
ΔFinancial Risk	-0.0151	0.5304	-0.0432	1	
ΔEconomic Risk	0.0108	0.6455	-0.0209	0.0989	1
Taiwan					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0314	1			
ΔPolitical Risk	0.0529	0.5241	1		
ΔFinancial Risk	-0.0106	0.4792	0.0491	1	
ΔEconomic Risk	-0.0801	0.6401	-0.2037	0.0911	1
Thailand					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.1539	1			
ΔPolitical Risk	0.0641	0.5786	1		
ΔFinancial Risk	0.1459	0.6827	0.1031	1	
ΔEconomic Risk	0.0967	0.6164	-0.0442	0.2152	1

Table G1: Correlations Among Variables (Cont'd)

Turkey					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0864	1			
ΔPolitical Risk	-0.0132	0.6982	1		
ΔFinancial Risk	0.0702	0.6376	0.2502	1	
ΔEconomic Risk	0.1184	0.5301	0.037	-0.0398	1
Argentina					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0174	1			
ΔPolitical Risk	0.004	0.6249	1		
ΔFinancial Risk	0.0066	0.6262	0.2515	1	
ΔEconomic Risk	-0.0457	0.6245	0.0414	0.0238	1
Jordan					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0192	1			
ΔPolitical Risk	0.0622	0.8087	1		
ΔFinancial Risk	-0.0061	0.8003	0.606	1	
ΔEconomic Risk	-0.0165	0.5462	0.0576	0.201	1
Morocco					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	-0.0434	1			
ΔPolitical Risk	-0.132	0.4825	1		
ΔFinancial Risk	0.0365	0.6968	0.0352	1	
ΔEconomic Risk	-0.0059	0.8348	0.0738	0.4584	1

Table G1: Correlations Among Variables (Cont'd)

Pakistan					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.2144	1			
ΔPolitical Risk	0.1658	0.7252	1		
ΔFinancial Risk	0.0904	0.5391	0.0712	1	
ΔEconomic Risk	0.1073	0.5032	-0.0054	0.0586	1
Srilanka					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0078	1			
ΔPolitical Risk	-0.0772	0.6548	1		
ΔFinancial Risk	0.0472	0.5061	0.0722	1	
ΔEconomic Risk	0.069	0.7307	0.0548	0.2618	1
Venezuela					
	ΔReturn	ΔComposite Risk	ΔPolitical Risk	ΔFinancial Risk	ΔEconomic Risk
ΔReturn	1				
ΔComposite Risk	0.0064	1			
ΔPolitical Risk	0.0457	0.4152	1		
ΔFinancial Risk	-0.0993	0.5106	-0.0545	1	
ΔEconomic Risk	0.0581	0.6338	-0.1064	-0.079	1

APPENDIX-H: Model Comparisons

Table H1: Costs of Equity Relative to the US

Country	Damodaran (2015)	Fernandez (2015)	Harvey (2015)	Composite (2015)	Disaggregated (2015)
DEVELOPED					
Australia	N/A	1.30%	0.96%	-1.24%	-2.04%
Austria	N/A	0.50%	1.10%	-1.24%	-0.70%
Belgium	N/A	-1.20%	2.79%	5.52%	8.65%
Canada	N/A	0.40%	0.02%	-9.22%	-6.90%
Denmark	N/A	-1.10%	0.61%	-5.29%	3.00%
Finland	N/A	-1.00%	0.68%	0.00%	-2.60%
France	N/A	-0.70%	2.49%	14.97%	26.05%
Germany	N/A	-1.30%	-0.04%	-9.22%	-8.20%
Hongkong	N/A	N/A	2.69%	-6.09%	1.48%
Ireland	N/A	-1.20%	6.74%	0.00%	-6.86%
Israel	N/A	-1.80%	5.74%	7.27%	24.13%
Italy	N/A	-0.90%	7.11%	10.83%	17.02%
Japan	-0.32%	-1.30%	2.89%	-3.69%	5.23%
Luxembourg	N/A	N/A	0.22%	-13.40%	-14.16%
Netherlands	N/A	-0.30%	0.80%	-3.69%	-4.17%
Newzealand	N/A	1.60%	1.82%	-7.66%	-8.19%
Norway	N/A	-1.10%	-0.27%	-17.46%	-17.33%
Portugal	N/A	-0.60%	11.29%	9.48%	16.99%
Singapore	N/A	N/A	0.16%	-14.89%	-8.50%
Spain	N/A	0.20%	7.55%	13.57%	21.80%
Sweden	N/A	-1.40%	-0.09%	-6.88%	-8.92%
Switzerland	N/A	-1.40%	-0.46%	-19.26%	-14.79%
UK	N/A	-0.70%	1.34%	-2.47%	0.11%
EMERGING					
Brazil	N/A	8.60%	7.84%	16.38%	39.35%
Chile	N/A	2.50%	3.73%	2.09%	13.16%
China	-1.47%	4.70%	4.13%	9.04%	42.90%
Colombia	N/A	4.20%	7.27%	14.04%	37.91%
CzechRep	N/A	-0.50%	4.08%	0.83%	6.54%
Egypt	N/A	N/A	24.22%	34.61%	75.12%
Greece	N/A	21.40%	22.00%	23.66%	29.93%
Hungary	N/A	1.60%	11.99%	10.38%	9.50%
India	N/A	7.90%	9.53%	14.97%	44.07%
Indonesia	N/A	8.50%	10.61%	18.28%	47.61%

Table H1: Costs of Equity Relative to the US (Cont'd)

Malaysia	N/A	N/A	5.54%	-2.06%	11.12%
Mexico	N/A	4.30%	5.89%	15.44%	39.07%
Peru	N/A	3.30%	7.27%	9.93%	34.35%
Philippines	N/A	N/A	10.84%	8.59%	36.45%
Poland	N/A	N/A	5.14%	4.65%	10.89%
Russia	N/A	9.20%	9.43%	23.16%	47.30%
SouthAfrica	N/A	8.00%	9.89%	17.80%	41.21%
Korea	N/A	N/A	2.94%	-6.88%	2.51%
Taiwan	N/A	N/A	2.97%	-9.22%	2.61%
Thailand	N/A	8.10%	9.96%	18.28%	51.45%
Turkey	N/A	9.30%	10.32%	25.67%	56.21%
FRONTIER					
Argentina	N/A	27.60%	29.62%	20.21%	46.68%
Jordan	N/A	N/A	18.32%	22.17%	47.55%
Morocco	N/A	N/A	12.07%	19.24%	40.29%
Pakistan	N/A	N/A	27.44%	36.25%	75.78%
Srilanka	N/A	N/A	22.72%	25.17%	51.05%
Venezuela	N/A	15.20%	24.01%	44.20%	102.86%

APPENDIX-I: Curriculum Vitae

PERSONAL INFORMATION

Surname, Name: Uzunkaya, Mehmet
Nationality: Turkish (TC)
Date and Place of Birth: 4 March1976 , Kırşehir
Marital Status: Married
Phone: +90 312 294 62 01
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EDUCATION

Degree	Institution	Year of Graduation
MA	Duke University School of Public Policy, International Development Policy	2006
BS	METU Civil Engineering	1998
High School	Ankara Ayrancı High School	1993

WORK EXPERIENCE

Year	Place	Enrollment
2010- Present	TR Ministry of Development	Development Planning Specialist
2002-2010	TR Prime Ministry, State Planning Organization	Development Planning Specialist
1998-2002	TR Prime Ministry, State Planning Organization	Assoc. Development Planning Specialist
1998-1998	METU Civil Engineering Department	Research Assistant
1996 Summer	EMT Erimtan Müşavirlik Taahhüt Ticaret A.Ş.	Intern Engineering Student
1995 Summer	Aktürk Yapı Endüstrisi ve Ticaret A.Ş.	Intern Engineering Student

FOREIGN LANGUAGES

Advanced English

PUBLICATIONS

1. "The Dynamics of BRICS's Country Risk Ratings and Stock Markets, U.S. Stock Market and Oil Price" with Shawkat Hammoudeh, Ramazan Sarı and Tengdong Liu, *Mathematics and Computers in Simulation (SCI),* Volume 94, August 2013, 227-294.
2. "The Relationship Between Disaggregated Country Risk Ratings and Stock Market Movements: An ARDL Approach", with Ramazan Sarı and Shawkat Hammoudeh, *Emerging Markets Finance and Trade (SSCI)*, January–February, Vol. 49, No. 1, pp. 5–17, 2013.
3. "Structural Analysis of the Turkish Construction Industry in the Framework of International Competitiveness", Turkish Ministry of Development, June 2013, (In Turkish), Available online at http://www.kalkinma.gov.tr/Lists/Yaynlar/Attachments/543/Uluslararası_Rekabet_Edebilirlik_Çerçevesinde_Türk_İnşaat_Sektörünün_Yapısal_Analizi_Mehmet_Uzunkaya.pdf

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6. “Estimation of the Economic Opportunity Cost of Capital for Turkey”, with Zeynep Canan Uzunkaya, Turkish Ministry of Development, November 2012, (In Turkish), Available online at http://www.kalkinma.gov.tr/Lists/Yaynlar/Attachments/512/Türkiye_için_Ekonomik_İndirgeme_Oranı_Tahmini.pdf

HOBBIES

Classical guitar playing, hand-made guitar construction

APPENDIX-J: Turkish Summary

1. Giriş ve Motivasyon

Özkaynak sermaye maliyetlerinin hesaplanması hususu, finans yazınında uzun zamandır çözülmeye çalışılan bir konudur (Harvey, 2005). Finansal Varlıkları Fiyatlama Modeli (CAPM) ve bu modelin çoklu faktör versiyonları ABD gibi ülkelerde yaygın olarak kullanılmakta ve bu modeller söz konusu ülkelerde benzer sonuçlar vermektedir. Graham ve Harvey (2001) yaptıkları anket çalışmasında, ABD'de şirket finans müdürlerinin (CFO) yüzde 73,5'inin, özkaynak maliyeti hesaplamak için Finansal Varlıkları Fiyatlama Modelini (CAPM) kullandığını tespit etmişlerdir. Bununla birlikte, ABD dışındaki ülkelerde bu modelin sonuçları farklılık göstermekte ve uluslararası piyasada özkaynak sermaye maliyeti hesabı konusunda bir fikir birliği bulunmamaktadır.

Uluslararası varlık fiyatlama yöntemleri, Örn. Solnik (1974), genellikle global piyasaların entegre olduğu ve yatırımcıların tümünün portföylerinde çeşitlendirilmiş global piyasa endeksine yer verdikleri temel varsayımları üzerine kurulmuştur. Bu varsayımlar, iyi işleyen hisse senedi piyasalarına sahip gelişmiş ülkelerde bile gerçeklikten uzak kalmaktadır. Hisse senedi piyasasına sahip olmayan geri kalmış ve gelişmekte olan ülkelerde ise mevcut uluslararası varlık fiyatlama modelleri uygulama alanı bile bulamamaktadır. Dolayısıyla, uluslararası yatırımcılar için sınır-ötesi özkaynak maliyeti hesabı oldukça güç hale gelmektedir.

Çalışmanın amacı, bu eksikliğin giderilmesi yönünde yazına katkıda bulunmaktır. Yeni bir uluslararası varlık fiyatlama teorisi önerilmemekle birlikte, ayrıştırılmış ülke riski bileşenleri ile ülke hisse senedi endeks getirileri arasındaki kısa ve uzun dönem potansiyel ilişkilerin geniş bir panel veri seti kullanılarak analiz edilmesi suretiyle empirik bir uluslararası özkaynak maliyeti modeli geliştirilmesi amaçlanmıştır. Mevcut teorik ve empirik yazın dikkate alındığında, ülke risk derece notları ve ülke hisse senedi endekslerinin uzun vadede birlikte hareket edecekleri ve bu değişkenler arasında uzun vadede bir denge olacağı (eşbütünleme ilişkisi), dolayısıyla ülke risk derece notlarının hisse senedi getirileri ile ilgili durum değişkeni olarak davranabileceği hipotezi test edilmektedir. Ülke riski derece notları, ülkelere has makroekonomik, finansal ve politik değişkenlerin dikkatle analizi sonucu elde edildiğinden, bu notlarla ülke hisse senedi piyasa endeksleri arasında kısa ve uzun vadeli ilişkiler olması mümkündür. Nitekim, "Varlık fiyatlarının ekonomi ile ilgili haberlere hassas bir şekilde tepki verdiği genel kabul görmüş bir olgudur (Chen, Roll ve Ross, 1986; s383) ve "varlık fiyatlarının birlikte hareket ediyor olması altta yatan dışsal etkilerin.... varlığına işaret etmektedir" (Chen, Roll ve Ross, 1986; s384). Gerçekten de Chen, Roll ve Ross (1986) tarafından yapılan analizler, hisse senedi fiyatları ile makro değişkenler arasında uzun dönemli bir denge ilişkisi olduğunu göstermektedir.

Chen, Roll ve Ross (1986)'a göre, herhangi bir hisse senedinin fiyatı, bu hisse senedinden gelecekte elde edilmesi beklenen nakit akışlarının bugünkü değerine eşit olduğundan, beklenen nakit akışlarını ve indirgeme oranını değiştirecek her türlü sistematik etki, hisse senedi fiyatlarını da etkileyecektir.

Bu çalışmada kullanılan ülke riski verilerinin bileşenlerine bakıldığında, gerek beklenen nakit akışlarını gerekse indirgeme oranlarını etkileme potansiyeli olan çok sayıda değişkene rastlanmaktadır.

Dolayısıyla, ülke riski derece notlarının ekonomik, finansal ve politik bileşenleri, hisse senedi piyasalarını etkileyebilecek potansiyel adaylar arasında girmektedir. Bununla birlikte, her bir risk derece bileşenini oluşturan alt değişkenlerin birbirleri ve hisse senedi piyasası ile olan komplike etkileşimleri düşünüldüğünde, ülke derece notları ile hisse senedi piyasaları arasındaki ilişkinin uzun dönemde daha belirgin olabileceği değerlendirilmektedir.

Makro değişkenlerin hisse senedi piyasaları üzerindeki etkilerini gösteren çok sayıda teorik ve empirik çalışma mevcuttur. İlgili literatür, ülke risk derece notları, ulusal hisse senedi piyasaları ve beklenen getiriler arasında da ilişkiler olduğunu göstermektedir. Ülke risk derece notları, ülkelerin ekonomik, finansal ve politik açıdan temel özelliklerini yansıttığından, söz konusu ilişkilerin tespit edilmesi beklenen bir sonuçtur.

Bu çerçevede, bu çalışma, ayrıştırılmış ülke riski bileşenleri ile ülke hisse senedi endeks getirileri arasında uzun dönemli bir eşbütünleme ilişkisi olup olmadığını geniş bir panel veri seti kullanarak test etmekte, testin sonuçlarına bağlı olarak da, bu değişkenler arasındaki uzun dönem ilişkinin yapısını analiz etmektedir.

Ayrıca, bulunan uzun dönemli ilişkinin katsayıları kullanılarak, risk derece notu bilinen herhangi bir ülkede yapılacak ortalama riske sahip bir yatırım için özkaynak maliyeti hesaplayan empirik bir model geliştirilmektedir.

Çalışmanın literatüre katkıları şu şekilde özetlenebilir:

a) Çalışma, ülke riski bilinen herhangi bir ülke için özkaynak maliyeti hesaplayan empirik bir model önermektedir. Kullanılan ülke riski derece notları çok sayıda ülke için mevcut olduğundan, modelin kullanım alanı oldukça geniştir.

b) Çalışma, ülke risk derece notları ile hisse senedi endeks getirileri arasındaki uzun vadeli ilişkinin yanında, bu değişkenler arasındaki kısa vadeli dinamik etkileşimleri de değerlendirmektedir. Çalışmanın temel dayanak noktası olan, ülke riski derece notları ile hisse senedi endeks getirilerinin uzun vadede birlikte hareket edebileceği hipotezi, sistemin dengeden ayrıldığı durumlarda kısa vadede dinamik bir dengeye geri dönüş mekanizmasını da beraberinde getirmektedir. Dolayısıyla, çalışma, bahsi geçen değişkenler arasındaki kısa dönemli dinamik ilişkileri de irdelemektedir.

c) Çalışma, ülkelerin politik, ekonomik ve finansal risk değişkenlerinin hisse senedi piyasaları üzerindeki etkilerini ayrıştırmaktadır. Panel eşbütünleme testleri, ülkelerin ayrıştırılmış risk derece notları ile hisse senedi endeks getirilerinin eşbütünleşik olduğuna ve ayrıştırılmış ülke riski derece notlarının bu ilişkide belirleyici değişkenler olduğuna işaret etmektedir. Dolayısıyla bu uzun dönem ilişkinin kat sayıları, ülkelerin politik, finansal ve ekonomik risk derece notlarının hisse senedi endeks getirileri üzerindeki görece etkileri hakkında faydalı bilgiler vermektedir.

d) Çalışma, üç önemli empirik sorunun çözümüne yönelik olarak, yeni geliştirilmiş ve görece sofistike panel zaman serisi yöntemleri kullanmaktadır: (i) ülke riski derece notları ile hisse senedi piyasası hareketleri arasındaki ilişkinin dinamikliği, (ii) bu ilişkinin ülkeler arasında değişebilen heterojen yapısı ve gözlemlenemeyen ortak faktörler ve (iii) yayılma etkileri sebebiyle oluşabilen ülkeler arası hata terimlerindeki bağımlılıklar.

Analiz sonuçları, ayrıştırılmış ülke riski bileşenleri ile (özellikle politik ve ekonomik risk) hisse senedi endeks getirileri arasında uzun dönemli bir ilişki olduğu fikrini desteklemektedir. Bu ilişki kullanılarak empirik bir uluslararası özkaynak maliyeti modeli önerisi getirilmiştir. Model, ülke riski derece notunu girdi olarak kullanarak derece notu bilinen herhangi bir ülke için uluslararası özkaynak maliyeti hesaplamaktadır.

2. İlgili Literatür

Uluslarası özkaynak sermaye maliyetinin belirlenmesinde iki temel modelden faydalanılmaktadır. Bunlardan ilki, literatürde kısaca CAPM olarak bilinen Finansal Varlıkları Fiyatlama Modeli (Capital Asset Pricing Model), diğeri ise literatürde kısaca APT olarak bilinen Arbitraj Fiyatlama Teorisidir (Arbitrage Pricing Theory).

Kısaca CAPM olarak bilinen Finansal Varlıkları Fiyatlama Modeli, Sharpe (1964), Lintner (1965) ve Mossin (1666) tarafından, Markowitz (1952)'in portföy teorisinden yola çıkılarak belirli varsayımlar altında elde edilen bir denge modelidir. Portföy teorisine göre, yeterli biçimde çeşitlendirilmiş (dolayısıyla sistemik olmayan risklerin bertaraf edildiği ve sadece sistemik risklerden etkilenen) bir portföyde yer alan bir varlığın riski, varlığın getirisi ile portföy getirisi arasındaki kovaryans, bir başka ifade ile o varlığın içinde bulunduğu portföyün riskine olan katkısı (betası), ile ölçülmektedir. Belirli varsayımlar altında, her bir yatırımcı, beklenen getiriyi maksimize ederken getirinin varyansını da minimize etmeye çalışmakta, bunun sonucunda da, herhangi bir varyans değeri için maksimum getiri değerine sahip portföylerin oluşturduğu etkin getiri eğrisi elde edilmektedir. Yatırımcıların, mevcut varlıkların ortalama getirileri ve bu getirilerin varyansları ile ilgili beklentilerinin aynı olduğu varsayımı altında tüm yatırımcılar aynı etkin getiri eğrisini elde etmekte, dolayısıyla piyasa dengesi kurulduğunda tüm yatırımcılar iki adet varlığı portföylerinde barındırmaktadırlar: piyasa portföyü ve risksiz varlık. Bu iki varlığın portföydeki ağırlıklarını ise kişinin risk algısı belirlemektedir.

Finansal Varlıkları Değerleme Modeli, teorik olarak oldukça mükemmel bir yapı sergilemekle birlikte, empirik olarak önemli eksiklikleri bulunmaktadır. Çok sayıda varsayıma dayalı olmasından ötürü, bu durum bir bakıma doğaldır. Çok daha az varsayıma dayalı olarak geliştirilen bir başka model ise kısaca APT olarak bilinen Arbitraj Fiyatlama Teorisidir (Arbitrage Pricing Theory). Ross (1976) tarafından geliştirilen bu model Finansal Varlıkları Fiyatlama Modeli'nin aksine, yatırımcıların varlıkların getirileri hakkında aynı beklentilere sahip olmayabileceği ve yatırımcıların sadece piyasa portföyü riskini değil daha farklı sistemik riskleri de dikkate alabileceğini varsaymaktadır. Bu modele göre, bir varlığın beklenen getirisi, o varlığın, çeşitlendirilemeyen sistemik faktörlere olan hassasiyetinin bir fonksiyonudur. Bu çerçevede, Arbitraj Fiyatlama Teorisi, piyasadaki herhangi bir arbitraj fırsatının piyasa dinamikleri tarafından kısa zaman içerisinde bertaraf edileceği, dolayısıyla, aynı beklenen getiriye sahip iki varlığın fiyatının da aynı olması gerektiği fikrinden hareket etmektedir. Dolayısıyla, bu prensibe aykırı fiyat sergileyen herhangi bir varlığın fiyatı, söz konusu arbitraj fırsatının piyasa aktörleri tarafından hızla değerlendirilmesi sonucunda olması gereken seviyeye yakınsayacaktır.

Finansal Varlıkları Fiyatlama Modeli, Solnik (1974) tarafından uluslararası piyasalara uyarlanmış ve bu model, Dünya FVFM (World CAPM) olarak adlandırılmıştır. Bu model uluslararası piyasaların kusursuz biçimde birbirine entegre olduğunu varsaymakta ve Finansal Varlıkları Fiyatlama Modeli'ndeki ülke piyasası portföyü yerine dünya piyasası portföyü kavramını kullanmaktadır. Dolayısıyla, herhangi bir varlığın betası, o varlığın getirisinin dünya piyasası portföyü getirisi ile olan kovaryansıdır.

Ferson ve Harvey (1993), Ross (1976) tarafından geliştirilen Arbitraj Fiyatlama Teorisinden yola çıkarak Çok Faktörlü Dünya FVFM (Multifactor World CAPM) modelini önermişlerdir. Bu modelde, varlıkların beklenen getirileri birden fazla faktörün fonksiyonu olarak ifade edilmekte, varlık getirisinin her bir faktörle olan duyarlılıkları ise faktör betaları olarak adlandırılmaktadır.

Uluslararası piyasalar için geliştirilen bu iki modelin çeşitli versiyonları da geliştirilmiştir. Bu modellerden bazıları şunlardır (daha detaylı bilgi için bkz: Harvey, 2005)

- Bekaert-Harvey Modeli
- Ülke Risk Primi Modeli

- Zımni Ülke Risk Primi Modeli
- Ülke Risk Primi Dalgalanma Oranları Modeli
- Damodaran Modeli
- Ibbotson Bayezyan Modeli
- Zımni Sermaye Maliyeti Modeli
- CSFB Modeli
- Erb-Harvey-Viskanta Modeli
- Benzer Beklenen Getiriler Modeli

Yukarıda bahsi geçen modeller, iki temel teoriden yola çıkarak elde edilmiştir. Bu çalışmada ise, ülke risk derece notları ile hisse senedi piyasaları arasındaki muhtemel uzun dönemli ilişkilerden yola çıkılarak bir empirik model geliştirilmektedir. Dolayısıyla, ülke riski ile hisse senedi piyasaları arasındaki ilişkinin çalışıldığı literatürden bahsetmek faydalı olacaktır.

Söz konusu literatürü iki temel bakış açısı ile incelemek yerinde olacaktır. Bunlardan ilki, ülke riski derece notları oluşturulurken dikkate alınan temel değişkenler ile hisse senedi piyasaları arasındaki ilişkiler, diğeri ise direkt olarak ülke riski derece notları ile hisse senedi piyasaları arasındaki ilişkilerdir.

Ülke riski derece notları oluşturulurken dikkate alınan temel değişkenler ile hisse senedi piyasaları arasında ilişki olduğunu gösteren çok sayıda çalışma bulunmaktadır. Bunlardan önde gelenleri, Fama (1981, 1990), Chen, Roll and Ross (1986) ve Schwert (1990) dır. Bu çalışmalar, ABD'de reel hisse senedi getirileri ile reel ekonomi arasında güçlü pozitif bir ilişki olduğunu göstermiştir.

Benzer şekilde Hardouvelis (1987), Flannery ve Protopapadakis (2002), Graham, Nikkinen ve Sahlström (2003) ve Chen (2009), ABD'de çeşitli makro değişkenler ile hisse senedi piyasaları arasında anlamlı ilişkiler olduğuna işaret etmektedir. Özellikle enflasyon-hisse senedi piyasaları ilişkisi yoğun biçimde çalışılmıştır (Fama ve Schwert, 1977; Fama, 1981; Geske ve Roll, 1983; Solnik, 1983; Gultekin, 1983; Brandt ve Wang, 2003; Hess ve Lee, 1999; Lee, 1992; Boudoukh ve diğ., 1994).

Makro değişkenler ile hisse senedi piyasaları arasında ABD'de görülen anlamlı ilişkiler bu ülke dışında da tespit edilmiştir. Bilson, Brailsford ve Hooper (2001) bu çalışmalara bir örnektir.

Makro değişkenler ile hisse senedi piyasaları arasında eşbütünleme ilişkisi bulan çok sayıda çalışma da mevcuttur. Humpe ve Macmillan (2007), Kwon ve Shin (1999), Mukherjee ve Naka (1995), Cheung ve Ng (1998), ve Wongbangpo ve Sharma (2002) bunlardan bazılarıdır.

Bazı çalışmalar ise özellikle politik risk ile hisse senedi piyasaları arasındaki ilişkiye odaklanmıştır. Örneğin Agmon ve Findlay (1982), politik riskin gerek nakit akış seviyesini düşürme, gerekse yatırım riski artırma etkileri sebebiyle varlık değerini azalttığını iddia etmektedir. Bailey ve Chung (1995) Maksika'da, Kim ve Mei (2001) ise Hong Kong'da siyasi gelişmelerin hisse senedi piyasaları üzerinde anlamlı etkileri olduğunu göstermiştir. Benzer şekilde, Chan ve Wei (1999) siyasi gelişmeler ile Hong Kong Hang Seng endeks getirileri arasında pozitif bir ilişki olduğunu göstermiştir. Bilson, Brailsford ve Hooper (2002) ise politik riskin getiri varyasyonlarını açıklamada gelişmekte olan ülkelerde gelişmiş ülkelere oranla daha önemli olduğunu savunmaktadır.

Ülke riski derece notları ile hisse senedi piyasaları arasındaki direkt ilişki, özellikle Erb, Harvey ve Viskanta (1995, 1996a, 1996b) tarafından detaylı biçimde incelenmiştir. 1995 yılında yaptıkları ilk çalışmada, Erb, Harvey ve Viskanta, ülke kredi derece notlarının, ülkeler arasında yüksek ve düşük beklenen getiri ayrımı yapabildiğini göstermiştir. Erb, Harvey ve Viskanta (1996a), kompozit ülke riski derece notları ile MSCI getiri endeksi arasında anlamlı bir ilişki bulmuş, bu ilişkiyi kullanarak gelişmekte olan ülkelerde ortalama riske sahip bir proje için özkaynak maliyeti hesaplayan empirik bir model geliştirmiştir. Erb, Harvey ve Viskanta (1996b) ise ayrıştırılmış ülke riski bileşenleri (politik, finansal, ekonomik) ile sabit-gelir varlığı getirileri arasındaki ilişkiyi incelemiş ve finansal risk bileşeni ile getiriler arasında negatif bir ilişki bulmuştur.

Ülke kredi derece notları ile hisse senedi piyasaları arasındaki ilişkiyi inceleyen diğer çalışmalardan bazıları ise şunlardır: Kaminsky ve Schmukler (2001), Brooks, Faff, Hillier ve Hillier (2004), ve Subaşı (2008). Diğer yandan, ülke kredi derece notları ile bono piyasaları arasındaki ilişki bulan çalışmalar da mevcuttur

(Örn., Cantor ve Packer, 1996; Reisen ve Maltzan, 1999; Sy, 2002). Ayrıştırılmış ülke riski bileşenleri ile hisse senedi piyasaları arasındaki ilişkiyi çalışan güncel çalışmalardan bazıları ise Sari, Uzunkaya ve Hammoudeh (2012); ve Hammoudeh, Sari, Uzunkaya ve Liu (2012)'dir.

3. Araştırma Tasarımı

Önceki bölümlerde yer verilen hususlar, makroekonomik değişkenler ile hisse senedi getirileri arasında öncül veya artçıl bir ilişki olduğunu göstermektedir. Ayrıca, politik riskin hisse senedi fiyatlarını etkilediği gösterilmiştir. Dolayısıyla, ülkelerin makroekonomik, finansal ve politik değişkenlerini yansıtan ülke riski derece notları ile hisse senedi piyasaları arasında da anlamlı bir ilişki beklenmelidir.

Bununla beraber, ülke riski derece notlarını oluşturan bileşenlerin birbirleri ile olan karmaşık etkileşim ve ilişkileri göz önüne alındığında, yukarıda varsayılan ilişkinin uzun vadede daha belirgin olarak görülebileceği düşünülmektedir. Bir başka deyişle, bu değişkenlerin uzun vadede birlikte hareket edecekleri, dolayısıyla bu değişkenler arasında uzun vadeli bir denge ilişkisinin olabileceği değerlendirilmektedir. Bu durumda, ülke riski derece notları ile hisse senedi getirileri uzun vadede eşbütünleşik hareket edecektir.

Bu çalışma, öncelikle söz konusu eşbütünleşme hipotezini geniş bir panel veri seti kullanarak test etmektedir. Eğer söz konusu değişkenlerin uzun vadede eşbütünleşik olmadıkları hipotezi reddedilirse, bu uzun dönem ilişkinin katsayıları üke riski derece notları ile hisse senedi endeks getirileri arasındaki kesit ilişkiyi verecektir. Bir başka deyişle, varsayılan uzun dönemli eşbütünleşme ilişkisinin katsayıları, ilgili risk derece notu bileşeni için bir "uluslararası risk primi"ni ifade edecektir.

Çalışmada ülke risk derece notlarını ölçümü için Politik Risk Hizmetleri'nin (PRS) Uluslararası Ülke Riski Rehberi (ICRG) tarafından üretilen politik, finansal ve ekonomik risk derece notları kullanılmaktadır. ICRG bu notları aylık bazda ve numerik olarak yayımlamakta, yüksek derece notu düşük riski ifade etmektedir. Poltik risk 0-100 arasında, finansal risk 0-50 arasında ve ekonomik risk de 0-50 arasında puanlanmaktadır. Bu üç derece notunun toplamının yarısı ise kompozit risk derece notunu göstermektedir. Varsayılan ilişkide, ülkeler arası kesitte doğrusal olmayan ilişkileri dikkate almak açısından tüm derece notlarının doğal logaritması alınmıştır.

Ülke hisse senedi endeks getirilerinin hesabında, Morgan Stanley Capital International (MSCI) Ülke Hisse Senedi Piyasası ABD Doları Cinsinden Fiyat Endeksi kullanılmıştır. Veriler Datastream veri tabanından indirilmiştir. MSCI endeksinin doğal logaritmasının birinci farkları alınarak, ilgili hisse senedi piyasası için sürekli bileşik aylık getiri değerleri elde edilmiştir.

Varsayılan uzun dönemli eşbütünleşme ilişkisinin testinde, Pesaran ve Shin (1998) tarafından geliştirilen Autoregressive Distributed Lag (ARDL) yaklaşımı ve Chudik, Pesaran, Mohaddes ve Raissi (2013), ve ayrıca Chudik, Pesaran, Mohaddes ve Raissi (2015) tarafından geliştirilen Distributed Lag (DL) yaklaşımı kullanılmıştır. Panel, gelişmiş, gelişmekte olan ve sınır ülkelerden[41] oluşan toplam 75 ülkeyi kapsamaktadır. Bu 75 ülkenin 24'ü gelişmiş, 21'i gelişmekte olan ve 30'u ise sınır ülke kategorisine girmektedir[42]. ARDL yaklaşımında katsayıların tahmininde, Pesaran ve Smith (1995) tarafından geliştirilen Grup Ortalaması Tahmin Yöntemi (Mean Group Estimator-MG), Pesaran, Shin ve Smith (1999) tarafından geliştirilen Toplu Grup Ortalaması Tahmin Yöntemi (Pooled Mean Group Estimator-PMG) ve Dinamik Sabit Etkiler Tahmin Yöntemi (Dynamic Fixed Effects Estimator-DFE) kullanılmıştır. Uzun dönemli katsayılar açısından yanıltıcı sonuçlar doğurabilen, ülkelere özel hata terimlerinin birbirlerini etkileme ihtimaline karşı ise, Chudik ve Pesaran (2015) tarafından geliştirilen Cross-Sectionally Augmented ARDL (CS-ARDL) yaklaşımı ve Chudik, Pesaran, Mohaddes ve Raissi (2013), ve Chudik, Pesaran, Mohaddes ve Raissi (2015) tarafından geliştirilen Cross-Sectionally Augmented Distributed Lag (CS-DL) yaklaşımı kullanılmıştır.

[41] "Sınır Ülke" kavramı ilk olarak 1992 yılında Farida Khambata isimli bir IMF ekonomisti tarafından dile getirilmiş olup, az gelişmiş ülkelerden daha gelişmiş olmakla birlikte gelişmekte olan ülkeler kadar büyük olmadıkları için bu kategoride değerlendirilmeyen ülkeleri ifade etmektedir.

[42] Sınır ülkelerin tamamının dahil edildiği "tam örneklem" analizlerinde, bu ülke grubunda yer alan ve yeterince uzun zaman serisine sahip olmayan ülkeler dolayısıyla, kesit bağımlılığı testi sonuç vermediğinden, örneklem büyüklüğü, bazı sınır ülkelerin örneklemden çıkarılması sonucunda 51'e kadar düşmüştür.

Çalışmada temel olarak ARDL yaklaşımının kullanılmasının sebepleri şu şekilde sıralanabilir. ARDL yaklaşımının temel olarak üç önemli avantajı bulunmaktadır. Birincisi, ARDL yaklaşımı, zaman serilerinin durağan olup olmamalarından ve beğımsız değişkenlerin endojen veya egzojen olup olmamalarından bağımsız bir şekilde kullanılabilmektedir. Dolayısıyla ARDL, klasik eşbütünleme metodlarının aksine, zaman serilerinin I(0), I(1) veya bunların karışımı olduğu durumlarda kullanılabilmektedir. Bu çalışmada kullanılan ayrıştırılmış risk derece notları, I(0) ve I(1) karışık serilerden oluştuğundan ARDL yöntemi avantaj sağlamaktadır. Diğer yandan, risk derece notları hisse senedi piyasalarını etkilerken, bunun tersi de düşünülebileceğinden (reverse causality), ARDL'nin, bağımsız değişkenlerin endojen veya egzojen olup olmamasından bağımsız şekilde kullanılabiliyor olması, mevcut çalışmada ilave kolaylık sağlamaktadır.

ARDL'nin ikinci avantajı, küçük örneklemlerde daha etkin eşbütünleme ilişkilerinin tespitine imkan sağlamasıdır (Ghatak ve Siddiki, 2001; Narayan, 2005). Üçüncü olarak ise, ARDL, durağan olmayan zaman serilerinde karşılaşılan sorunları bertaraf etmektedir (Laurenceson ve Chai, 2003).

ARDL'nin dezavantajları ise, uzun zaman serilerine ihtiyaç duyması, gecikme uzunluklarının tespitinin doğru yapılması zorunluluğu ve ülkelere özgü hata terimlerinin birbirlerinden bağımsız olduğunu varsaymasıdır. Bu dezavantajların bertaraf edilmesi için ise Cross-Sectionally Augmented ARDL (CS-ARDL) ve Cross-Sectionally Augmented Distributed Lag (CS-DL) yaklaşımları kullanılmaktadır.

Temel ARDL modeli aşağıdaki gibidir:

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it}$$

burada,

$$\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$$

ve

$$\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$$

burada, y_{it} MSCI ülke hisse senedi piyasası ABD doları bazında endeks değerinin doğal logaritmasını, x_{it} =(lnP_{it}, lnF_{it}, lnE_{it})', lnP_{it} politik risk derece notunun doğal logaritmasını, lnF_{it} finansal risk derece notunun doğal logaritmasını, lnE_{it} ekonomik risk derece notunun doğal logaritmasını, *Dummy* 2008 küresel krizi için kullanılan kukla değişkeni, *Trend* lineer zaman trendini, ve p_x ve p_y ilgili gecikme uzunluklarını ifade etmektedir. Dikkat edilecek olursa, eşitliğin sol tarafında endeks değerinin doğal logaritmasının birinci farkı sürekli bileşik aylık endeks getirisini vermektedir. Maksimum gecikme uzunluğu 6 ay olarak alınmıştır.

Panelde yer alan ülkelerin hata terimlerinin birbirleri ile ilişkili olabileceği ihtimaline karşı kullanılan Cross-Sectionally Augmented ARDL modeli ise aşağıdaki gibidir. Bu modelde, klasik ARDL modeline, bağımlı ve bağımsız değişkenlerin kesit değerlerinin ortalamaları ve bunların gecikmeli değerleri ilave bağımsız değişkenler olarak eklenmektedir.

$$\Delta y_{it} = c_i + \sum_{l=1}^{p_y} \varphi_{il} \Delta y_{i,t-l} + \sum_{l=0}^{p_x} \beta'_{il} x_{i,t-l} + \sum_{l=0}^{p_{\bar{z}}} \psi'_{il} \bar{z}_{t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it}$$

burada

$$\hat{\lambda}_i = 1 - \sum_{l=1}^{p_y} \hat{\varphi}_{il}$$

ve

$$\hat{\theta}_i = \lambda_i^{-1} \sum_{l=0}^{p_x} \hat{\beta}_{il}$$

burada, y_{it} MSCI ülke hisse senedi piyasası ABD doları bazında endeks değerinin doğal logaritmasını, $x_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{z}_t = (\bar{y}_t, \bar{x}'_t)'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} politik risk derece notunun doğal logaritmasını, lnF_{it} finansal risk derece notunun doğal logaritmasını, lnE_{it} ekonomik risk derece notunun doğal logaritmasını, *Dummy* 2008 küresel krizi için kullanılan kukla değişkeni, *Trend* lineer zaman trendini, ve p_x, p_y ve p_z ilgili gecikme uzunluklarını ifade etmektedir.

Son olarak, Cross-Sectionally Augmented Distributed Lag (CS-DL) modeli aşağıdaki gibidir:

$$\Delta y_{it} = c_{yi} + \theta_i' x_{it} + \sum_{l=0}^{p-1} \delta_{il} \Delta x_{i,t-l} + \sum_{l=0}^{p_{\bar{y}}} \omega_{y,il} \Delta \bar{y}_{i,t-l} + \sum_{l=0}^{p_{\bar{x}}} \omega'_{x,il}\, \bar{x}_{t-l} + \gamma_i Dummy_{it} + \eta_i Trend + u_{it}$$

burada, y_{it} MSCI ülke hisse senedi piyasası ABD doları bazında endeks değerinin doğal logaritmasını, $x_{it} = (lnP_{it}, lnF_{it}, lnE_{it})'$, $\bar{z}_t = (\bar{y}_t, \bar{x}'_t)'$, $\bar{x}_t = N^{-1}\sum_{i=1}^{N} x_{it}$, $\bar{y}_t = N^{-1}\sum_{i=1}^{N} y_{it}$, lnP_{it} politik risk derece notunun doğal logaritmasını, lnF_{it} finansal risk derece notunun doğal logaritmasını, lnE_{it} ekonomik risk derece notunun doğal logaritmasını, *Dummy* 2008 küresel krizi için kullanılan kukla değişkeni, *Trend* lineer zaman trendini, ve p, p_x ve p_y ilgili gecikme uzunluklarını ifade etmektedir.

Yukarıda verilen modellerdeki uzun dönem katsayılarının tahmininde kullanılan tahmin metotları ise şu şekildedir: ARDL yaklaşımında, Pesaran ve Smith (1995) tarafından geliştirilen Grup Ortalaması Tahmin Yöntemi (Mean Group Estimator-MG), Pesaran, Shin ve Smith (1999) tarafından geliştirilen Toplu Grup Ortalaması Tahmin Yöntemi (Pooled Mean Group Estimator-PMG) ve Dinamik Sabit Etkiler Tahmin Yöntemi (Dynamic Fixed Effects Estimator-DFE) karşılaştırmalı olarak kullanılmıştır. CS-ARDL modelinde, Pesaran ve Smith (1995) tarafından geliştirilen Grup Ortalaması Tahmin Yöntemi (Mean Group Estimator-MG) ve Pesaran, Shin ve Smith (1999) tarafından geliştirilen Toplu Grup Ortalaması Tahmin Yöntemi (Pooled Mean Group Estimator-PMG); CS-DL modelinde ise sadece Grup Ortalaması Tahmin Yöntemi (Mean Group Estimator-MG) kullanılmıştır.

4. Empirik Uygulama ve Bulgular

CS-ARDL yöntemi sadece durağan panellerde kullanılabildiği için empirik uygulamaya panel birim kök testleri ile başlanmıştır. Her bir seriye üç farklı birim kök testi uygulanmıştır: Bunlar, i) Im, Pesaran, Shin panel birim kök testi, ii) Fisher Type Dickey-Fuller panel birim kök testi and iii) Fisher Type Phillips-Pherron panel birim kök testidir. Im, Pesaran, Shin panel birim kök testinde "bazı paneller durağandır" alternatif hipotezine karşın, "bütün paneller birim kök içerir" sıfır hipotezi söz konusu iken, diğer iki testte "bütün paneller birim kök içerir" sıfır hipotezine karşın "en az bir panel durağandır" alternatif hipotezi test edilmektedir. Levin-Lin-Chiu, Harris-Tzavalis ve Breitung testleri, tam dengeli panel veri gerektirdiğinden uygulanmamıştır.

Gelişmiş ve gelişmekte olan ülkelere uygulanan panel birim kök testleri, bütün panellerin birim kök içerdiği hipotezini güçlü bir biçimde reddetmektedir. Sınır ülkelerde ise politik risk serisinde birim kök yönünde kanıt görülürken, kompozit ve finansal risk serilerinde bazı testler alternatif hipotez yönünde sonuç vermektedir. MSCI serisi için bütün testler sıfır hipotezini güçlü şekilde reddetmektedir.

Panel birim kök testlerinden sonra Pedroni (1999)'nin panel eşbütünleme testleri uygulanmıştır. Bu test, bütün ülke grupları ve tüm örneklem için eşbütünleme yönünde güçlü kanıtlar sunmaktadır. Dolayısıyla, çalışmanın temel hedeflerinden birisi olan, ülke risk derece notları ile hisse senedi piyasaları arasında uzun dönemli bir ilişki olabileceği hipotezi güçlü destek bulmaktadır.

Bu testlere ilaveten, her bir model ve tahmin metodu için, panelde yer alan ülkeler arasında hata terimlerinin bağımlılığı da test edilmiştir. Son olarak, farklı tahmin metodları arasında seçim yapabilmek için Hausman testinden yararlanılmıştır.

Yukarıda belirtilen ön testler sonrasında, ülke risk derece notları ile hisse senedi endeks getirileri arasındaki uzun dönemli ilişkinin katsayılarını bulmak için 4 farklı örneklemde (gelişmiş ülkeler örneklemi, gelişmekte olan ülkeler örneklemi, sınır ülkeler örneklemi ve tüm örneklem) klasik ARDL, CS-ARDL ve CS-DL modelleri çalıştırılmıştır. Bu modeller, kompozit risk derece notları ve ayrıştırılmış (politik, finansal, ekonomik) risk derece notları için ayrı ayrı uygulanmış ve analizler 2008 krizi öncesi ve sonrası dönemler için tekrarlanmıştır.

Analizlere kompozit risk derece notları bağımsız değişken olarak alınarak başlanmıştır. Klasik ARDL yaklaşımında tüm örneklem grupları için istatistiksel olarak anlamlı uzun dönemli katsayılar elde edilmiştir. Ancak, aynı zamanda klasik ARDL yaklaşımında, kesit bağımlılık testlerinde son derece yüksek istatistikler elde edilmiştir. Bu durum, elde edilen uzun dönemli katsayıların dikkatle değerlendirilmesini gerektirmektedir.

Kesit bağımlılıklarını azaltmak için kullanılan CS-ARDL modelinde, kesit bağımlılık test istatistikleri ciddi oranda düşmüş ancak istatistiksel olarak anlamlı seviyelerde kalmıştır. Ayrıca, CS-ARDL modelinin uzun dönem veri seti ihtiyacından ötürü, 3’den uzun gecikme değerleri için katsayılar hesaplanamamıştır.

CS-DL modelinde ise bu yönde bir kısıt olmadığından, bağımsız değişkenlerin gecikme değerleri modelin gerektirdiği uzunlukta belirlenebilmiştir. Ayrıca, CS-DL modelinde kesit bağımlılık testlerinde klasik ARDL yöntemine göre ciddi düşüşler gözlenmiş, dolayısıyla önerilen empirik model CS-DL yöntemi baz alınarak geliştirilmiştir. Benzer bir durum ayrıştırılmış risk derece notlarının bağımsız değişkenler olarak alındığı modellerde de geçerlidir.

Sonuç olarak, gerek kompozit risk derece notlarının gerekse ayrıştırılmış risk derece notlarının bağımsız değişken olarak alındığı modellerde CS-DL yönteminin sonuçları esas alınmıştır.

Bu çerçevede, örneklemin tamamı için kompozit risk derece notlarının bağımsız değişken olduğu CS-DL modeli sonuçlarına göre, kompozit risk derece notlarındaki yüzde birlik bir artış, hisse senedi endeksi aylık getirisinde 10.7 baz puanlık (yıllık olarak 1.284 yüzde puanlık) bir düşüşü ifade etmektedir.

Ayrıştırılmış risk derece notlarının bağımsız değişken olduğu CS-DL modeli sonuçlarına göre, tüm örneklem için, politik ve ekonomik risk derece notlarının katsayıları istatistiksel olarak anlamlı olup, politik risk derece notundaki yüzde birlik bir artış hisse senedi endeks getirisinde aylık 9.6 baz puanlık (yıllık olarak 1.152 yüzde puanlık), ekonomik risk derece notundaki yüzde birlik bir artış ise hisse senedi endeks getirisinde aylık 4.7 baz puanlık (yıllık olarak 0.564 yüzde puanlık) düşüşe işaret etmektedir.

2008 küresel krizi öncesi ve sonrası için tekrarlanan analizlerde ise, kriz öncesinde ülke riski derece notları ile hisse senedi endeks getirileri arasında yukarıda özetlenen ilişkilere benzer ilişkiler olduğu, ancak kriz sonrası dönemde bu ilişkinin kaybolduğu gözlenmiştir. Kriz sonrası zaman serisi verilerinin, modellerin gerektirdiği uzunlukta olmamasının bunun bir sebebi olabileceği değerlendirilmektedir.

5. Empirik Model Önerisi

Empirik uygulama bölümünde elde edilen uzun dönemli katsayılar, uluslararası özkaynak maliyeti modeli önerisine baz teşkil etmektedir. Önerilen modele baz teşkil eden CS-DL yaklaşımına göre, hisse senedi endeks getirileri ile ayrıştırılmış ülke riski derece notarı arasında aşağıdaki uzun dönemli ilişki tespit edilmiştir.

$$R_{it}=a_t-1.152\ln P_{it} -0.564\ln E_{it} +\mu_i+\varepsilon_{it}$$

Her iki tarafın beklenen değerleri alındığında;

$$E(R_{it})=E[a_t-1.152\ln P_{it} -0.564\ln E_{it} +\mu_i+\varepsilon_{it}]$$

a_t sabit olduğundan $E(a_t)=a_t$

Ayrıca $E(\mu_i)=E(\varepsilon_{it})=0$, dolayısıyla,

$$E(R_{it})=a_t-1.152\ln \overline{P_{it}} -0.564\ln \overline{E_{it}}$$

burada $E(R_{it})$ beklenen getiri, $\overline{P_{it}}$ i ülkesi için ortalama politik risk derece notu ve $\overline{E_{it}}$ i ülkesi için ortalama ekonomik risk derece notudur.

Farklı politik ve ekonomik risk derece notuna sahip iki ülke düşünülecek olursa; bu ülkelerden bir tanesinde özkaynak maliyetinin bir şekilde hesaplanabildiğini (örn. CAPM modelinin ABD'de görece güvenilir sonuçlar verdiği bilinmektedir.), ve diğer ülkede ise özkaynak maliyetini hesaplamak istediğimizi varsayalım. Ayrıca, bu her iki ülkede de söz konusu risk derece notlarının en az 3 ay boyunda değişmediğini varsayalım[43]. Bu durumda, uzun dönemde

$$E(R_{it})=a_t-1.152\ln \overline{P_{it}} -0.564\ln \overline{E_{it}}$$

Uzun dönem dengesi varsayıldığında, $\overline{P_{it}} = P_{it}$ and $\overline{E_{it}} = E_{it}$, dolayısıyla,

$$E(R_{it})=a_t-1.152\ln P_{it} -0.564\ln E_{it}$$

burada, $E(R_{it})$ *i* ülkesi için geçerli ortalama yıllık beklenen özkaynak getirisi, P_{it} , *i* ülkesinin *t* zamanındaki politik risk derece notu, ve E_{it} ise *i* ülkesinin *t* zamanındaki ekonomik risk derece notudur. *j* ülkesi için ise,

$$E(R_{jt})=a_t-1.152\ln P_{jt} -0.564\ln E_{jt}$$ olacaktır.

burada, $E(R_{jt})$ *j* ülkesi için geçerli ortalama yıllık beklenen özkaynak getirisi, P_{jt} , *j* ülkesinin *t* zamanındaki politik risk derece notu, ve E_{jt} ise *j* ülkesinin *t* zamanındaki ekonomik risk derece notudur. $E(R_j)$ and $E(R_i)$ farkı alındığında,

$$E(R_{jt}) - E(R_{it}) = a_t-1.152\ln P_{jt} -0.564\ln E_{jt} -(a_t-1.152\ln P_{it} -0.564\ln E_{it})$$

Dolayısıyla,

[43] Modelin uygulanabilmesi için bu varsayım kritik önem sahiptir, zira çalıştırılan modellerin önerdiği katsayılar, uzun dönem denge durumunu göstermektedir. Seçilen modelin önerdiği "uzun dönem" ise yaklaşık 3 aydır.

$$E(R_{jt}) - E(R_{it}) = 1.152\ln(\frac{P_{it}}{P_{jt}}) + 0.564\ln(\frac{E_{it}}{E_{jt}})$$

i ülkesi, özkaynak maliyetinin bilindiği bir referans ülke olarak kabul edilirse,

$$E(R_{jt}) - E(R_{Bt}) = 1.152\ln(\frac{P_{Bt}}{P_{jt}}) + 0.564\ln(\frac{E_{Bt}}{E_{jt}})$$

ve,

$$E(R_{jt}) = E(R_{Bt}) + 1.152\ln(\frac{P_{Bt}}{P_{jt}}) + 0.564\ln(\frac{E_{Bt}}{E_{jt}})$$

CAPM modelinin ABD'de görece güvenilir sonuçlar verdiği bilindiğine göre, referans ülke olarak ABD alınırsa, $E(R_{Bt})$ CAPM kullanılarak hesaplanabilecektir. Bu durumda,

$$E(R_{jt}) = E(R_{USt}) + 1.152\ln(\frac{P_{USt}}{P_{jt}}) + 0.564\ln(\frac{E_{USt}}{E_{jt}})$$

ve,

$$E(R_{USt}) = r_{fUSt} + \beta(R_{MUSt} - r_{fUSt})$$

burada, $E(R_{jt})$ *j* ülkesi için yıllık beklenen özkaynak getirisi, $E(R_{USt})$ ABD için yıllık beklenen ortalama özkaynak getirisi, P_{USt} ve E_{USt}, *t* zamanında ABD için sırasıyla politik ve ekonomik risk derece notları, P_{jt} ve E_{jt}, *t* zamanında *j* ülkesinin sırasıyla politik ve ekonomik risk derece notları, r_{fUSt}, *t* zamanında *ABD* için geçerli risksiz varlık getiri oranı, R_{MUSt} *t* zamanında ABD'de piyasa getiri oranı, ve β bahse konu projenin betasıdır.

Bir örnek vermek gerekirse, ABD ve Türkiye'yi ele alalım. Her iki ülkede politik ve ekonomik risk derece notlarının en az üç ay süre ile değişmediği bir ay tespit edilebilirse (Ekim 2012 böyle bir dönemdir) her iki ülkede uzun dönem denge noktasından bahsetmek mümkün olacaktır. Söz konusu ay için ABD'de politik ve ekonomik risk derece notları sırasıyla 83.5 ve 36.5 iken, bu notlar Türkiye için sırasıyla 56.5 and 33'dür. Bu değerler modelde yerine konursa;

$$E(R_{TRt}) = E(R_{USt}) + 1.152 ln(\frac{P_{USt}}{P_{TRt}}) + 0.564 ln (\frac{E_{USt}}{E_{TRt}})$$

$$E(R_{TR}) = E(R_{US}) + 1.152 ln (\frac{83.5}{56.5}) + 0.564 ln (\frac{36.5}{33})$$

$$E(R_{TR}) = E(R_{US}) + 50.7\%$$

Dolayısıyla bu modele göre, Türkiye'de ortalama riske sahip bir proje için beklenen özkaynak getiri oranı ABD'de aynı proje için beklenen getiri oranından 50.7 yüzde puan daha yüksektir.

Benzer bir yaklaşım kompozit model için de takip edillirse (Ekim 2013 risk verileri esas alınarak),

$$E(R_{TRt}) = E(R_{USt}) + 1.284 ln(\frac{75.50}{62.25})$$

$$E(R_{TRt}) = E(R_{USt}) + 24.8\%$$

Dolayısıyla bu modele göre, Türkiye'de ortalama riske sahip bir proje için beklenen özkaynak getiri oranı ABD'de aynı proje için beklenen getiri oranından 24.8 yüzde puan daha yüksektir. Görüldüğü üzere, ayrıştırılmış risk derece notları modeli kompozit risk derece notları modeline göre çok daha yüksek özkaynak maliyeti farkı önermektedir. Ülkelerin politik risk derece notu varyasyon farklılıklarının, aynı ülkelerin kompozit risk derece notları varyasyon farklılıklarından daha yüksek olmasının buna sebep olabileceği düşünülmektedir. Kompozit risk derece notları, ayrıştırılmış risk derece notlarının lineer kombinasyonu olduğundan bu farklılıkları gizleyebileceği, dolayısıyla kompozit modelin daha düşük özkaynak maliyeti farklılığı işaret edebileceği muhtemeldir.

6. Sonuç

Mevcut teorik ve empirik literatürün ışığında bu çalışma, ülke riski derece notları ile ülke hisse senedi endeks getirilerinin uzun vade perspektifinde birlikte hareket edeceğini ve bu uzun dönemli ilişkinin, söz konusu ülkelerde özkaynak maliyeti hesabında kullanılabileceğini savunmakta ve bu hipotezi test etmektedir. 51 ülkeyi içeren geniş bir panel veri seti kullanılarak yapılan testlerde, ülke riski derece notları ile ülke hisse senedi endeks getirileri arasında uzun dönem ilişki olduğu yönünden istatistiksel olarak anlamlı kanıtlar elde edilmiştir. Bu ilişkinin dinamik olduğu, risk derece notlarındaki değişimin hisse senedi endeks getirileri üzerinde etkisinin bir kaç ay sürdüğü ve sistemin 2-5 ay arasında dengeye ulaştığı tespit edilmiştir.

Bulunan uzun dönemli ilişkiye göre, kompozit risk derece notunda yüzde bir oranındaki bir artış (azalış), hisse senedi endeks getirilerinde aylık 10.7 baz puanlık bir azalışa (artışa) sebep olmaktadır. Ayrıştırılmış ülke riski bileşenleri dikkate alındığında ise, politik ve ekonomik risk derece notlarında görülen yüzde bir oranındaki bir artış (azalış), ülke hisse senedi endeks getirilerinde sırasıyla 9.6 ve 4.7 baz puanlık azalışı (artışı) beraberinde getirmektedir.

Elde edilen bu sonuçlardan faydalanılarak, bir referans ülkeye göre uluslararası özkaynak maliyeti hesaplayan aşağıdaki modeller önerilmiştir.

Ayrıştırılmış risk derece notları kullanılarak;

$$E(R_{jt}) = E(R_{Bt})+1.152ln(\frac{P_{Bt}}{P_{jt}})+ 0.564ln\,(\frac{E_{Bt}}{E_{jt}})$$

ve,

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt})$$

burada, $E(R_{jt})$ j ülkesi için yıllık beklenen özkaynak getirisi, $E(R_{Bt})$ referans ülke için yıllık beklenen ortalama özkaynak getirisi, P_{Rt} ve $E_{Rt,}$ t zamanında referans ülke için sırasıyla politik ve ekonomik risk derece notları, P_{jt} *ve* $E_{jt,}$ t zamanında j ülkesinin sırasıyla politik ve ekonomik risk derece notları, $r_{fRt,}$ t zamanında referans ülke için geçerli risksiz varlık getiri oranı, R_{MRt} t zamanında referans ülkede piyasa getiri oranını, ve β bahse konu projenin betasıdır.

Kompozit risk derece notları kullanılarak,

$$E(R_{jt}) = E(R_{Bt})+1.284\ln(\frac{C_{Bt}}{C_{jt}})$$

$$E(R_{Bt})=r_{fBt} + \beta(R_{MBt}-r_{fBt})$$

burada, $E(R_{jt})$ j ülkesi için yıllık beklenen özkaynak getirisi, $E(R_{Rt})$ referans ülke için yıllık beklenen ortalama özkaynak getirisi, P_{Rt} ve $E_{Rt,}$ t zamanında referans ülke için sırasıyla politik ve ekonomik risk derece notları, P_{jt} *ve* $E_{jt,}$ t zamanında j ülkesinin sırasıyla politik ve ekonomik risk derece notları, $r_{fRt,}$ t zamanında referans ülke için geçerli risksiz varlık getiri oranı, R_{MRt} t zamanında referans ülkede piyasa getiri oranı ve β bahse konu projenin betasıdır.

Ayrıştırılmış risk derece notları modeli kompozit risk derece notları modeline göre çok daha yüksek özkaynak maliyeti farkı önermektedir. Ülkelerin politik risk derece notu varyasyon farklılıklarının, aynı ülkelerin kompozit risk derece notları varyasyon farklılıklarından daha yüksek olmasının buna sebep olabileceği düşünülmektedir. Kompozit risk derece notları, ayrıştırılmış risk derece notlarının lineer kombinasyonu olduğundan bu farklılıkları gizleyebileceği, dolayısıyla kompozit modelin daha düşük özkaynak maliyeti farklılığı işaret edebileceği muhtemeldir.

APPENDIX-K: Tez Fotokopisi İzin Formu

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı : Uzunkaya
Adı : Mehmet
Bölümü : İşletme

TEZİN ADI : An Empirical Model of the International Cost of Equity

TEZİN TÜRÜ : Yüksek Lisans [ ] Doktora [X]

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. [X]
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
3. Tezimden bir (1) yıl süreyle fotokopi alınamaz. [ ]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: