DOES THE RULE OF "SOVEREIGN CEILING" HOLD FOR THE CIS COUNTRIES?

by

Dmytro Galytskyy

A thesis submitted in partial fulfillment of
the requirements for the degree of

Master of Arts in Economics

National University "Kyiv-Mohyla Academy"
Economics Education and Research Consortium
Master's Program in Economics

2006

Approved by _____
Ms. Serhiy Korablin (Head of the State Examination Committee)

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Program Authorized
to Offer Degree Master's Program in Economics, NaUKMA

Date _____

National University "Kyiv-Mohyla Academy"

Abstract

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Head of the State Examination Committee: Mr. Serhiy Korablin,
Economist, National Bank of Ukraine

This study investigates the appropriateness of the rule of "sovereign ceiling" in the case of CIS countries. According to this rule, no company is more creditworthy than its government. For the countries in sample (Ukraine, Russia, and Kazakhstan) we use the data on spreads on corporate and government bonds to analyze the risk transfer from a government debt security to a corporate one. We find that the rule is not always believed by market participants, since often the risk transfer is less than 100%. Later we pool the data to estimate the industry and country-average coefficients. Again we find that investor's perception of risk does not always coincide with the full (100%) risk transfer and the justification of the rule of "sovereign ceiling" that whenever the government defaults, the firm defaults too, should be questioned.

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ACKNOWLEDGMENTS

The author wishes to express thanks to my thesis advisor Tatyana Zabotina, to Olesya Verchenko, as well as to Tom Coupe for being always available for questions, and of course to my parents and friends.

GLOSSARY

Yield to maturity (ytm) on a bond is that single rate that discounts the payments on the bond to its purchase price. It reflects the total return an investor receives by holding the bond until it matures.

Rating class – a category of bonds with (nearly) the same probability of default. Rating classes are assigned by credit agencies such as Moody's and S&P. For example, AAA (S&P) or Aaa (Moody's) is a very high quality class. BBB (S&P) or Baa (Moody's) is a high quality class.

Credit spread – the difference between the yields on bonds with the same maturities but of different rating classes. It reflects the default or credit risk of a lower-rated bond compared with the higher-rated bond.

Term spread – the difference between the yields on bonds that are identical in every way except maturity.

Chapter 1

INTRODUCTION

Studies of yield spreads on corporate bonds have received a wide acknowledgement in the last decades. The importance of spreads on bonds with different credit ratings and different maturities is stressed in many academic papers (see for example Kamin and Kleinst [1999]). Some of them explore the importance of the yield spreads between corporate bonds of different qualities as a measure of an aggregated level of credit risk in the economy or as a forecasting tool for the overall economic activity. Others concentrate on the analysis of the yield spreads between corporate and government bonds, or the relationship between yield spreads and the stock market (Lamdin [2003]). The practical side of the estimation of credit spreads is important for pricing bonds themselves and derivatives on them. Moreover, as Dionne et al [2004] indicates, the default probabilities of the bond issuers are used as an input in practical risk models used by commercial banks to calculate their exposure to the credit risk.

One of the perceptions of the default probabilities is the so-called "sovereign ceiling" rule. It is a long standing policy of credit agencies saying that no firm is more creditworthy than its host government. By applying this rule practitioners adjust for a country risk while implementing their investment projects in the emerging markets (Durbin and Ng [2002]). Given the practical and theoretical importance of credit spreads, a natural question to ask is whether the rule of "sovereign ceiling" is appropriate for the CIS bond markets and the Ukrainian in

particular. That is to say, to what extent the government default probability is incorporated into the corporate risk premium[1].

The test for the "sovereign ceiling" rule gives us more than just a characteristic of the bond markets. It provides us with the understanding of investor's risk perception of the economy in general that has an important implication for different types of foreign investments in the emerging markets. Loan pricing, FDI, investment portfolio decisions, risk capital measurements are dependent on the overall perception of the risk associated with the home country of borrower or project.

In examining the above stated question the approach applied by Durbin and Ng [2002] is adopted. So, the starting point is to hypothesize that there is a 100% risk transfer from the government to a firm. Also, the assumption that when the government defaults, the firm defaults too is imposed. There are some reasons to make such an assumption. First, when the government faces a payment crisis it can tax the firm, impose some foreign exchange controls, or even seize the firm's assets. Second, any crisis that the government faces affects macroeconomic environment in which the firm operates (empirical evidence from Russia's crisis of 1998: currency devaluation, government's default, 90-day debt repayment moratorium[2]). If there is no full risk transfer, then it might happen that investors evaluate the prospects of a particular company higher than of its [company's] government. As Durbin and Ng [2002] write, if the rationale of sovereign ceiling is strictly believed by investors then the change in yield of a sovereign bond will be associated with at least as great a change in the yield of a similar corporate bond.

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[1] The liquidity of corporate bonds may explain some fraction of credit spread. However, as many other authors did in their works, we abstract from this issue.

[2] See e.g. Gologov and Matthews [1999].

In agreement with the approach of Durbin and Ng [2002], the logic to follow is to subtract the risk-free interest rate from the yield of the bonds (both corporate and government.) to obtain the yield spreads over the risk-free interest rate. Then we regress the change in the yield spread of the firm's bond on the change in the yield spread of the corresponding government bond. If the rule of sovereign ceiling is believed by investors in its strict form (100% risk transfer) then the increase in the sovereign spread by 1 percentage point will be associated with at least 1 percentage point increase in the corporate bond spread. Also, we include a dummy for the specific industry to check for the specific industry reaction, since industries differ in their reaction on the change in the macroeconomic environment and some industries are easier to tax than others, meaning the risk transfer is different for different industries.

To test the appropriateness of the "sovereign ceiling" rule we use the data that comes from the company CBonds Ltd. It maintains the website (www.Cbonds.info) as an independent, non-affiliated provider of information on the world fixed income markets. The data set used in this paper consists of the issues of government and corporate bonds for Ukraine, Russia and Kazakhstan; and issues of municipal bonds for Ukraine and Russia. We proceed as follows. In Chapter 2 we examine the literature. Chapter 3 elaborates on the theory behind the analysis. Chapter 4 presents the estimation results and Chapter 5 concludes.

Chapter 2

LITERATURE REVIEW

The markets for debt securities in the emerging economies have expanded significantly during the last decade. Corporate bond markets, in particular, grew strongly over the second half of the 1990s. According to the IMF estimates (Global Financial Stability Report [September, 2005]), at the end of 2004, the emerging economies had a total of more than $2.6 trillion in domestic and international bonds outstanding. In the typical emerging bond market around half of bonds are issued by governments and the rest are evenly distributed between corporate, financial, and international issuers. The main reasons for the development of the debt markets are the risk diversification away from banks and the need for a different source of finance for the economy. According to the IMF's Global Financial Stability Report (GFSR) [April, 2005] corporate bond markets also play an important role in strengthening the companies' balance sheets and decreasing the vulnerability of the corporate sector of economy. Given such an important role of the corporate bond market, it is not surprising that many researches have focused on yields and prices of bonds. It is important to note that corporate and government bond markets do not develop separately. The evidence provided by the IMF (GFSR [September, 2005]) supports the fact that countries with larger outstanding government debt tend to have larger corporate bond markets. At the same time corporate bond markets are rather new. They were almost absent in the most mature markets in the early 1980th, except for the United States. Thus, it is not surprising that the debt crisis of 1980th has stimulated an extensive study of prices, yields and credit spreads of bonds in emerging economies. Numerous models and theories were proposed

and tested explaining the pricing of bonds and the divergence in yields for bonds of different credit ratings or maturities. One of the empirical rules, namely the rule of "sovereign ceiling" known in practice, was questioned by researches to be appropriate. The natural question to ask here is: Should the companies be seen as more likely to default than their home governments? In other words "How much of the spread between rates on corporate bonds and government bonds is explained by default risk?" (Dionne et al [2004]).

While describing the studies on yield spreads it seems impossible not to mention several fundamental works on debt pricing. Two main approaches for the bond pricing exist: the structural approach and the reduced form approach. The basic difference between them lies in the variables they use as their input. The first approach starts with the well-known paper written by Merton [1974] who examines the corporate debt in a view of a probability of the firm's default. He extended the Black-Scholes model for option pricing and applied it for pricing corporate liabilities. The structural approach uses company-specific information and considers the debt as a contingent claim on firm's value. The default risk is then derived from the relationship between firm value and debt value. There was a lot of work to improve Merton's model and introduce more realistic assumptions. In a more recent work Leland [1994] extends the results received by Merton [1974] and Black and Cox [1976] by including taxes, bankruptcy costs and protective covenants (if any) to give more precise estimation of long-term corporate debt. Longstaff and Scwartz [1995] derive a closed-form solution for valuation of risky corporate debt providing some interesting insights about hedging corporate debt. They relax the assumption of the Merton's model that the firm may default only when its assets are exhausted. Fan and Sundaresan [2000] for example, introduce bargaining power parameter and make possible a redistribution of power between equityholders and debtholders. It is important

since the assumption about absolute priority rule[3] is often violated in reality. Franks and Torous [1994] show that the strict absolute priority rule was violated in 78% of the bankruptcies of their sample.

The reduced-form approach works directly with market information, modeling default risk from what is implied in market prices, credit spreads etc. That is, the reduced-form models do not condition default on the value of the firm, and parameters related to the firm's value do not need to be estimated (see e.g. Elton et al [2001]).

Risk factor premium is another approach for debt valuation that is popular among practitioners. Fisher [1959] considered a credit spread as a compensation for various risks in a linear relationship. By risk premium Fisher implied the difference between the market yield on a bond and a corresponding risk free interest rate. He was able to show that the default premium depends on such parameters as variation in the company's net income, time that this company operates without forcing its debtors to take a loss, and the ratio of the market value to the debt value. Unlike some other authors (Bodie, Kane, and Marcus [1993]; Fons [1994], Cumby and Evans [1995]), Fisher [1959] does not rely on assumption that the risk premium consists only from the default probability, but also on the liquidity of the bonds traded. As Hull et al [2004] notes, traders do not base their prices for bonds only on the actuarial probability of default, but they also build in an extra return to compensate for the risks they are bearing.

Being interested in the fraction of government's default risk that is transferred to companies, we may naturally question what makes the government default.

[3] Absolute priority rule implies that that equityholders can only obtain a positive payoff after debtholders have been totally reimbursed when a company defaults.

Although this question is beyond the scope of this paper, it is worth noting briefly on the key points of the investigation in this direction. The debt crisis that occupied such countries as Mexico, Brazil, and Argentina among others in 1982-1983 gave a strong incentive to research this field. Edwards [1984] investigated the determinants of the spread between the interest rate charged and the London Interbank Offering Rate (LIBOR). Edwards noted that if the financial community distinguishes between countries with different probabilities of default, this will be reflected in the premium over the LIBOR. He shows some support to this argument. Boehmer and Megginson [1990] provide an interesting analysis of developing countries syndicated loans. They investigate factors that determine secondary market prices of these loans and find that the value of debt depends on the country's solvency rather then the liquidity of the market for its debt. Some authors, in particular Claessens and Pennacchi [1996], look at the repayment capacity as a measure of a country risk. They introduce a measure of repayment capacity by constructing a pricing model that takes into account such specific factors of international lending/borrowing as third-parity guarantees, special terms of debt agreement, etc. Further studies also separate country and currency risk of investing in emerging economy. For example, Domovitz and Madhavan [1998] show that shocks in debt market returns translate into the long-term increases in the premium demanded by investors with respect to country and currency factors.

In evaluating the sovereign risk credit ratings assigned by credit rating agencies play an important role. Sovereign ratings are credit ratings that are assessments of the relative likelihood that a borrower (state) will default on its obligations. They are calculated using a variety of economic, social, and political factors (per capita income, GDP growth, inflation, fiscal balance, external balance, external debt, economic development, default history etc.). Moody's in its "Special Comment" [1999] on historical defaults notes that there were only ten sovereign defaults

documented and rated by Moody's after the WWII. These defaults are the 1998's defaults by Venezuela, the Russian Federation and Pakistan. Other sovereign defaulters include Argentina, Costa Rica, Guatemala, Panama, Poland, Rhodesia (Zimbabwe), and Uruguay. Cantor and Packer [1996] show that on average "market - gauged by sovereign debt yields – broadly shares the relative rankings of sovereign credit risks" made by the rating agencies. At the same time they provide some evidence that the fact of credit rating announcement has some impact on yields and verify this conclusion by measuring the bonds spread. This impact is partially supported by the study of Christensen et al [2004] which gives the evidence that recently downgraded issuers have a greater chance to experience further downgrades and, as a consequence, the risk premium on their debts will increase.

In examining the question about how much of the country's default risk is incorporated into the company's default risk we use credit spreads. The fact that credit spreads contain important information is supported by many papers. Specifically, Kamin and Kleinst [1999] produced a study of a large sample of spreads between US and emerging debt markets and the spreads' development during the 90th up to the Asian financial crisis. Their sample covered not only so-called Brady bonds[4] but also issues of other countries in the Middle East, East Asia, Offshore Centers, Africa, and Eastern Europe. One of the main conclusions drawn by the authors is that spreads on emerging market debts have a strong significant relationship to credit rating, maturity and currency of issue. Furthermore, the research is able to show that the overall credit spreads have declined before the Asian financial crisis by more than can be explained by the improvement in risk. Guha et al [2001] also argues that the spread between

[4] Named due to US Treasure Secretary Nicholas Brady who proposed official support for a reduction in country debt burdens. Nine countries felt under this plan initially: Mexico, Argentina, Philippines, Costa Rica, Venezuela, Uruguay, Bulgaria, Poland and Nigeria.

corporate bonds of different quality (i.e. the quality spread) is a good indicator of the aggregate level of credit risk in the economy. Interestingly enough, Guha et al [2001] provides a way to forecast the quality spread with the business cycle variables. Extending the previous findings Uribe and Yue [2005] conclude that not only business cycles of emerging economies themselves matter but also the shocks to the US interest rate since the business cycles in EMs are correlated with the cost of for them in the international financial markets. The spread between government and corporate bonds has a tight relation to the default probability of the country of residence of company. One of the papers that examine the recent trends in the corporate bonds yield spreads is that of Lamdin [2003]. His analysis covers last 30 years of the US debt market and concludes that the trends are different depending on the rating class of corporate bonds. The spreads of Aaa over US Treasuries and Baa over US Treasuries have risen over time. The spread between Baa and Aaa, however, did not show the same trend. Also, Lamdin investigates the relationship between yield spreads and stock market movements. Testing for causality shows that stock market movements precede changes in yield spreads. Developing the issue about the relationship between the yields and stock market returns Elton et al [2001] suggests that a significant portion of the premium impounded into the corporate yields over the risk free ones is closely related to the factors explaining the risk premium for common stocks. He shows that the expected default "accounts for a surprisingly small fraction of the premium in corporate rates over treasuries". Important conclusion is made that a large fraction of the risk carried by the corporate bond is not a diversifiable risk, but rather a systematic[5] one. Dionne et al [2004] relax the risk neutrality assumption that was imposed in previous papers. Contrary to the conclusions of

[5] Systematic risk (also called market risk) – a risk that is attributable to marketwide risk sources. The risk that remains even after extensive diversification.

Elton et al [2001], the findings of Dionne et al [2004] support the idea that the estimated default risk can represent a substantial fraction of the spread between the corporate and government bonds.

One of the researches who mentioned possible biases in estimation of the risk with the difference in the yields between corporate and government bonds was Silvers [1973]. He noted that the main determinants of the risk premium are the expected loss rate due to default, an additional increment to compensate for risk-bearing, and some other factors (marketability, call options, etc.). He proposed an alternative view of a risky bond price as a discounted present value of future certainty equivalent payments. Then he introduced a certainty coefficient (to be a ratio of certainty equivalent payments to promised payment) as a measurement of a riskiness of a bond.

An interesting empirical paper that investigates the corporate credit risk is that of Wong and Law [2002] written for the case of Hong Kong. The authors attempt to build an empirical dynamic model to price corporate debts in Hong Kong. In their study they use only market data (i.e. observable data) and do not use credit ratings. In general, they use the KMV model (KMV is a consulting firm in Chicago) which follows Merton's option approach to price credit risk. The purpose of the paper is to investigate the goodness of fit of the model and its power in explaining the yield spreads. The authors find weak support to the model.

One of the researches who also rely on the KMV data is Iain Maclachlan [2000]. Using the data on the company's default rates he concludes that the rule of "sovereign ceiling" is not appropriate (at least in case of Korea). Durbin and Ng [2002] also do not find a strict support to the rule of "sovereign ceiling". Using the data for bond issues of 14 emerging countries, they construct series for pairs

of bonds: corporate and sovereign with the correspondent characteristics. Their data spans over five years. The authors also conclude that the spreads of emerging government and corporate bonds over the hard-currency government bonds (e.g. over the 10-year US Treasuries) are highly-correlated. This fact also supports the idea that the debt financing opportunities (that emerging countries face on the international markets) are highly dependent on the US interest rate and, consequently, shocks to it (see for example Uribe and Yue [2005]).

Chapter 3

THEORY

The main proposition we want to test in this paper is that of a 100% risk transfer between the host government and the firm in this country. While we may think that any given firm is more risky than its host government, this does not necessarily imply that there exist a 100% risk transfer from government to the firm. Durbin and Ng [2002] in the appendix to their work explicitly show that in the case of a full (meaning a 100%) risk transfer the situation of the government default is a subset of all situations when firm defaults. Also, as the authors do in their work we should also note that if a particular firm is considered to be less creditworthy than its government then the sovereign ceiling rule may be applicable as a rule of thumb. So, by testing the sovereign ceiling we examine the justification of the rule which says that whenever the government defaults, the firm defaults, too.

As a starting point, we consider US T-Bills as an approximation to the risk-free interest rate instrument. Thus, we take a yield on bond (corporate, government, municipal) and subtract from it the shortest (3 months) US T-Bills yield. It gives us the risk premium related to the country-default risk.

As was already mentioned, we apply the methodology of Durbin and Ng [2002] and use the following basic regression equation:

$$\Delta s_{it}^{F} = \beta \Delta s_{it}^{G} + u_{it}, \quad \text{where}$$

Δs_{it}^{F} - is the change in the spread of the firm's bond from period t-1 to t,

Δs_{it}^{G} - is the change in the spread of the government's bond from period t-1 to t, and

u_{it} - error term.

To control for the firm specific events that may contribute to the firm's default probability, we take the first differences. If the rule of sovereign ceiling is strictly believed by the market participants then we should expect that $\beta \geq 1$. If we find that $\beta < 1$ then we can conclude that investors do not strictly believe in the 100% risk transfer but, as Durbin and Ng [2002] put it, this does not mean that investors consider the company as being less risky than its host government. Also note that we do not attempt to test here a causality relation between sovereign and corporate yield spreads. The change in the sovereign spread does not necessarily imply the change in the corporate spread. So, as one of the tests we check whether beta is equal 1.

Ideally, we would like to have pairs of bonds with the same maturities. It is not possible to do with the available data. Therefore, we will have to use bonds with slightly different maturities while constructing pairs. So, we need then to control for maturity differences. Here we come to the assumptions of the form of the yield curve. Durbin and Ng [2002] recognize that the assumption of a fixed yield curve is too strict. However, it would be convenient to assume the fixed yield curve to control for the maturity difference which therefore can be seen as a fixed effect that will disappear due to the first difference. This is rather a strong assumption. That's why we go to the linear, time-varying yield curve. Following the methodology of Durbin and Ng [2002] and Eichengreen and Mody [1998] we allow a linear yield curve. So, the basic regression becomes of the form

$$\Delta s_{it}^{F} = \beta \Delta s_{it}^{G} + \varphi \Delta Z(t) + u_{it}$$

where

$\Delta Z(t)$ - is a vector of a yield curve variables.

The Z(t) variable needs more attention. First, as Durbin and Ng [2002] we assume that the yield spreads on government bond, $s_{it}^{G,n}$, and the yield spread on firm's bond, $s_{it}^{F,m}$, have the following relationship

$$s_{it}^{G,n} - s_{it}^{F,m} = w_t(m-n)$$

where n and m represent the time to maturity for the government and corporate bond, respectively.

Second, we run the regression

$$\Delta s_{it}^{F,m} = \beta \Delta s_{it}^{G,n} + \varphi \Delta Z(t) + u_{it}$$

where $\Delta Z(t) = Z(t) - Z(t-1)$ and $Z(t) = D(t)(m-n)$ with D(t) being a monthly dummy.

In principle, each firm will have its own beta. But we would like to allow for different coefficients for 3 countries to check whether investors, on average, consider one of them being more "safe" than others. To do the industry analysis we pool the data on companies of a particular industry for each country and run pooled regression of the abovementioned form. Later we pool all industries of a particular country to estimate the average country beta.

It is very important to mention that many of bonds in the data sample are not very liquid. It would be rather naïve to believe that yield spreads capture only default risk. Rather there is a strong concern that bond spreads are capturing some other types of risk other than the default risk and that the change in spread reflects the effect of these omitted variables. The abovementioned liquidity characteristic is one example of such an omitted variable. Since we are going to run a regression on changes in corporate bond yields the liquidity risk may not be an issue if it is not dependent on default rate. However, we do not have any explicit tool to correct for illiquidity of some bonds in the sample.

Chapter 4

REGRESSION RESULTS

The pairs of bonds were constructed according to the described methodology and regressions were run. We are interested to check whether the coefficients are statistically different not only from zero but from one as well. Being not different from one implies the "sovereign ceiling" rule in its strictest form, namely the 100% transfer. While for the most bond issues the beta coefficients are indeed smaller than 1, for many of them coefficients are found to be not significantly different from zero (employing 15% significance level rule), varying from "nearly" significant with p-values of 0.15-0.25 to highly insignificant with p-values over 0.8. Not being different from zero implies the zero risk transfer from a government debt security to a corporate one. The closer look on regression outcomes among 3 countries reveals some interesting results. There are 225 pairs and consequently 225 separate individual regressions run. In only 3 cases we find beta being greater than 1.

1. For Kazakhstan we are able to collect the data on corporate bonds only for 2 industries: banking industry represented most of the issues (14), and oil & gas industry with 2 issues.[7]

Table 1 – Individual regression results for Kazakhstan

Name	β–Coefficient (se)	# of obs	*t*–test	
			β=0	β=1
			F[6], Prob>F	F, Prob>F
Banking				
Alliance Bank	-.006094 (.0258879)	106	0.06 0.8144	1510.37 0.000

[6] The t-test and F-test for a single coefficient produce the same results.

ATF Bank (maturing 2007)	-.0170631 (.0297943)	210	0.33 0.5675	1165.28 0.000
ATF Bank (maturing 2009)	-.0358561 (.0284012)	210	1.59 0.2082	1330.23 0.000
CentreCreditBank	.0116773 (.020729)	145	0.32 0.5741	2273.21 0.000
Development Bank of Kazakhstan (maturing 2007)	**.0654138 (.0192958)**	**435**	**11.57 0.0007**	**2345.63 0.000**
Development Bank of Kazakhstan (maturing 2020)	**.0327429 (.0181159)**	**145**	**3.27 0.0728**	**2850.77 0.000**
KazKommerzBank (maturing 2007)	**.0680252 (.0280847)**	**436**	**5.87 0.0158**	**1101.20 0.000**
KazKommerzBank (maturing 2009)	.2938043 (.3812477)	136	0.59 0.4423	3.43 0.0662
KazKommerzBank (maturing 2013)	**.0285506 (.0146107)**	**436**	**3.82 0.0513**	**4420.76 0.000**
Nurbank	-.0037892 (.0239044)	145	0.03 0.8743	1763.31 0.000
Turan Alem Bank (maturing 2007)	-.007397 (.0199014)	210	0.14 0.7105	2562.32 0.000
Turan Alem Bank (maturing 2010)	-.0110924 (.0231295)	210	0.23 0.6320	1910.96 0.000
Turan Alem Bank (maturing 2014)	-.005804 (.020107)	210	0.08 0.7731	2502.27 0.000
Turan Alem Bank (maturing 2015)	.0057116 (.0176595)	108	0.10 0.7470	3170.07 0.000
Oil & Gas				
KazTransOil	.0418807 (.0378774)	436	1.22 0.2695	639.85 0.000
PetroKazakhstan	**.0451743 (.0196401)**	**427**	**5.29 0.0219**	**2363.53 0.000**

All available issues for Kazakhstan are denominated in US dollars. There is rather a straightforward explanation that some of the bond issues do have a strong correlation with the government. The Development Bank of Kazakhstan, for example, is obviously highly connected to the government since its main objective is to participate in the long-run nationwide programs aimed at economic development. The fact that beta of PetroKazakhstan is not zero or one, as the test suggests, is also rather easy to explain: this is the company that deals with natural resources on which Kazakhstan is rich. In contrast, the coefficient with KazTransOil is not different from zero although the company is

[7] Issues with coefficients statistically different from both 0 and 1 are market bold. Issues with coefficients statistically different from 0 but not 1 are market in bold italic.

also engaged in the natural resources business. Important to note that all significantly different from 0 coefficients are much smaller than 1 with the highest of 0.068 for KazKommerzBank (maturing 2007). This implies that only 6.8% of the additional risk that the government carries will be transferred to this particular banking company. The t-test for $\beta=1$ also rejects the hypothesis that the risk transfer is 100% for all issues. For KazKommerzBank maturing 2009 with its standard error being greater than the coefficient we cannot reject the hypothesis that its $\beta=0$. However, two other bond issues of this issuer show the common pattern with coefficients significantly different from both zero and one. One of possible explanations to this fact could be some conditions related to this particular issue, for example a release of new information that the issue will be bought out before the maturity. There are also some suggestions on why the risk transfer is so small. First of all, the economy of Kazakhstan is rather stable and grows continuously (although one can not speak about democracy); second, it relies heavily on its rich natural resources, especially oil and gas (which prices were rising substantially over the last decade). These facts might force investors evaluate positively the prospect of the country and its main exporting industry.

In theory, the longer the maturity of the issue the larger is its vulnerability to the change of interest rates in the economy. However the data, or the lack of its availability, does not allow us to make a conclusion that the further the maturity of the issue, the greater is the coefficient. It is more difficult to explain why so many coefficients are not significantly different from zero, meaning they show no relation with government. This may partly be explained by the fact that the time span used for regressions is on average about 1 year and for some issues longer horizons needed to recognize the relation. Durbin and Ng [2002], for instance, use in their work change in spread on a monthly basis and the length of the bonds tested is 5 years. From a theoretical standpoint the $\beta=0$ simply means that there is no risk transfer from a government bond to a corporate one. And the

question 'Why is it so?' needs further investigation.

2. Ukraine

Table 2 – Individual regression results for Ukraine

Name	β–Coefficient (se)	# of obs	*t*–test	
			β=0	β=1
			F, Prob>F	F, Prob>F
Banking & Finance				
AlfaBank (maturing 2009)	-.7005167 (3.03099)	202	0.05 0.8175	0.31 0.5754
CreditPromBank (maturing 2005)	1.583333 (3.075067)	125	0.27 0.6076	0.04 0.8499
CreditPromBank (maturing 2006)	.1723168 (.4194311)	138	0.17 0.6818	3.89 0.0505
CreditPromBank (maturing 2011)	***.675753 (.2571192)***	***81***	***6.91 0.0103***	***1.59 0.2109***
Dnestr (maturing 2006)	-.2034161 (.3268006)	177	0.39 0.5345	13.56 0.0003
Dnestr (maturing 2007)	**.2705281 (.1089622)**	**175**	**6.16 0.0140**	**44.82 0.000**
Garant (maturing 2007)	***1.108907 (.5116943)***	***103***	***4.70 0.0326***	***0.05 0.8319***
East Industrial Bank	.9565899 (.9102643)	168	1.10 0.2948	0.00 0.9620
Khreschatick	-1.16855 (.9739613)	189	1.44 0.2317	4.96 0.0272
Megabank	.1101419 (.279539)	175	0.16 0.6941	10.13 0.0017
Metropolya	-.5159595 (.4142501)	102	1.55 0.2158	13.39 0.0004
Privat Bank	.179325 (.2969135)	202	0.36 0.5466	7.64 0.0062
UkrEximBank	**.0924838 (.0511629)**	**200**	**3.27 0.0722**	**314.63 0.000**
UkrSibBank (maturing 2008)	**.1342266 (.0724618)**	**100**	**3.43 0.0670**	**142.75 0.000**
UkrSotsBank (maturing 2008)	**.2092163 (.065192)**	**134**	**10.30 0.0017**	**147.14 0.000**

Chemical				
Azot	.0470559 (.9358578)	103	0.0 0.96	1.04 0.3110
Natur	-1.664484 (5.371634)	102	0.1 0.7573	0.25 0.6210
Stirol	.0239195 (.0372484)	80	0.41 0.5227	686.68 0.000
Communication				
Farlep	-.0016496 (.4336932)	202	0.0 0.997	5.33 0.0219
Kyivstar (maturing 2009)	**.1921913 (.068942)**	**200**	**7.77 0.0058**	**137.29 0.000**
Kyivstar (maturing 2012)	**.7776303 (.1013488)**	**108**	**58.87 0.000**	**4.81 0.0304**
UkrTeleCom	**.492934 (.1598068)**	**165**	**9.51 0.0024**	**10.07 0.0018**
Construction				
Arkada	-.6929209 (.7338341)	102	0.89 0.3488	5.32 0.0245
BDC (maturing 2014)	**.3008601 (.1108034)**	**177**	**7.37 0.0073**	**39.81 0.000**
Distribution Centre	.1175479 (.8791885)	118	0.02 0.8939	1.01 0.3176
DS	-.6060398 (.5776829)	114	1.10 0.2964	7.73 0.0064
Kommercheskaya kompaniya	-.2977751 (.3980392)	177	0.56 0.4554	10.63 0.0013
Romsat	.1149897 (.4606743)	104	0.06 0.8034	3.69 0.0575
TMM (maturing 2007)	.2492793 (2.499538)	202	0.01 0.9207	0.09 0.7642
TMM (maturing 2008)	-.4732965 (.6266379)	175	0.57 0.4511	5.53 0.0198
Electric power				
EnergoAtom	-.0159564 (.7620934)	175	0.00 0.9833	1.78 0.1842
Engineering				
Loutsk automobile plant	-.0696095 (1.25461)	105	0.0 0.9559	0.73 0.3959

Food				
Agrospetsresursy (maturing 2008)	-.93943 (3.343757)	169	0.08 0.7791	0.34 0.5627
AVK (maturing 2009)	.1913755 (.1920682)	173	0.99 0.3205	17.72 0.000
AVK (maturing 2009 - C)	**.1941572 (.1164892)**	**202**	**5.01 0.0263**	**15.59 0.001**
Conti	-1.329256 (10.00164)	126	0.02 0.8945	0.05 0.8162
Galaktis	-.1587859 (28.07672)	202	0.0 0.9955	0.0 0.9671
Greesun	-.8948044 (1.347272)	177	0.44 0.505	1.98 0.1614
New Krakhmal Technology	.0640744 (.1896871)	110	0.11 0.7362	24.34 0.000
Poultry Plant Yarishiv	.0365891 (.303251)	175	0.01 0.9041	10.09 0.0018
Pridneprovsky	-2.23971 (5.670993)	175	0.16 0.6934	0.33 0.5685
Sarmat	.1414017 (.2652078)	181	0.28 0.5946	10.48 0.0014
Sindikat (maturing 2005)	.7477945 (1.397429)	109	0.29 0.5937	0.03 0.8571
Sindikat (maturing 2008)	.0999713 (.1997997)	202	0.47 0.4943	40.54 0.000
SIT-relain	.1913147 (1.329102)	175	0.02 0.8857	0.37 0.5437
Sunoil	-.7653994 (6.603609)	202	0.01 0.9078	0.07 0.7895
Ukrshampiniyon	1.247878 (2.808493)	202	0.2 0.6573	0.01 0.9298
Metals				
Metalen	-2.757947 (12.70803)	197	0.05 0.8284	0.09 0.7678
Titan (maturing 2005)	.6526152 (1.112445)	142	0.34 0.5584	0.1 0.7553
Titan (maturing 2006)	.0859476 (.1256131)	161	0.47 0.4948	52.95 0.000
Oil & Gas				
ChernomorNaftoGaz (maturing 2006)	**.4409488 (.1760102)**	**178**	**6.28 0.0131**	**10.09 0.0018**
GalNaftoGaz	**.4864505 (.2526961)**	**102**	**3.71 0.0571**	**4.13 0.0448**
NaftoGaz	**.3900666 (.2365601)**	**200**	**2.72 0.1008**	**6.65 0.0107**

Other				
Stal'kanat (maturing 2006)	**.2368742 (.0657162)**	**195**	**12.99 0.0004**	**134.85 0.000**
Stal'kanat (maturing 2007)	**.5359267 (.1653482)**	**196**	**10.51 0.0014**	**7.88 0.0055**
Trade				
Arestei	.6273083 (1.355472)	196	0.21 0.6440	0.08 0.7836
Biznes	1.288532 (5.369817)	175	0.06 0.8106	0.0 0.9572
Kviza-Trade	.0536846 (1.129807)	118	0.0 0.9622	0.7 0.4040
Velika Kishenya Finance	.3524557 (1.978425)	196	0.03 0.8588	0.11 0.7438
Zolotoi Rog	.0477103 (.0549074)	175	0.73 0.3927	292.81 0.000
HARP Trading	.2900191 (1.020544)	202	0.08 0.7766	0.48 0.4874
Transport				
Borispol	.0664899 (.1081795)	102	0.38 0.5402	74.46 0.000
Decort (maturing 2008 - A)	**.4719567 (.1602831)**	**152**	**8.67 0.0038**	**10.85 0.0012**
Decort (maturing 2008 – B)	**.0804898 (.0450858)**	**157**	**3.19 0.0762**	**415.94 0.000**
Decort (maturing 2008 – C)	**.1551851 (.1005325)**	**162**	**2.38 0.1247**	**70.62 0.000**
South-west Railways	**.4116516 (.2116482)**	**197**	**3.78 0.0532**	**7.73 0.0060**
UkrTransGaz	-.1522054 (.130634)	202	1.36 0.2454	77.79 0.000
Municipal				
Donetsk (maturing 2007)	**.1277592 (.0816465)**	**186**	**2.45 0.1193**	**114.13 0.000**
Donetsk (maturing 2010)	**.3530057 (.1674183)**	**93**	**4.46 0.0375**	**14.13 0.0003**
Kharkov (maturing 2008)	**.0811864 (.053772)**	**102**	**2.28 0.1342**	**291.97 0.000**
Kiev (maturing 2008)	**.0529482 (.0309799)**	**202**	**2.92 0.0890**	**934.52 0.000**
Kiev (maturing 2011)	**.405341 (.060811)**	**212**	**44.43 0.000**	**95.63 0.000**
Zaporozhje (maturing 2007)	**.2226112 (.1110036)**	**192**	**4.02 0.0463**	**49.05 0.000**

Again we see that in many cases we cannot reject the hypothesis that the coefficient is zero. In general, it is unexpectedly that bond yields of so many

leaders of national industries do not correlate with the yield of national government. However, there are many issues compared to Kazakhstan where both hypotheses (zero and one) cannot be rejected because of very large standard error. As an example, the s.e. of AlfaBank's bond maturing 2009 is 4.3 times greater than its coefficient, in absolute terms. UkrEximBank is the state bank that officially serves the state export-import operations. In addition, it is the only Ukrainian bank that has a branch in the New York City. The Garant bank shows the coefficient greater than 1. Because of financial machinations this bank is currently not operating and is in a process of liquidation. Communication provides better results. First, Kyivstar, a national mobile operator has coefficients between 0 and 1; the value of the coefficient with a bond maturing 2012 which is rather a long-term bond for Ukraine, is greater than of its 2007 counterpart supporting the theory that the further the maturity, the larger is the coefficient. Thus, it is logically to expect that a bond with maturity in 2012 will be considered as more risky than the one with maturity in 2009, all else being equal. UkrTelecom which is not only a state-owned company, but also a monopolistic one, also shows risk transfer much less than 100%. Only for 1 company out of 3 in the Chemical industry we are able to reject the hypothesis that the coefficient is equal 1. However for none of them we reject the $\beta=0$ hypothesis. The same picture is in trade: only for one company we can reject the null $\beta=1$. All other issues can have coefficient 1 as well as 0 showing no clear connection to the change in government yield. In food and construction only one issue in each are significantly different from both 0 and 1. Such industries as engineering, electric power (state company EnergoAtom) and metals do not show clear picture. Oil and gas industry is represented by 2 state and 1 private corporations with coefficients being between 0 and 1. As expected, this particular industry is highly correlated with the yield on state debt. In transport South-West Railways is a state monopolist, and the case is similar to the one of Ukrtelecom. Stal'kanat (other industries) also shows less than 1 to 1 risk transfer although it is connected to the

metal industry. The municipal bonds all show less than 100% risk transfer, although the municipal power can be seen as a part of governmental.

3. Russia

Table 3 – Individual regression results for Russia

Name	β–Coefficient (se)	# Of Obs	*t*–test	
			β=0	β=1
			F, Prob>F	F, Prob>F
Agriculture				
APC Arkada	**.0641154 (.0411028)**	**100**	**2.43 0.1220**	**518.44 0.000**
Roskhleboproduct	.0189996 (.138167)	131	0.02 0.8908	50.41 0.000
Banking & Finance				
Alfa Bank (maturing 2005)	.0069973 (.0131436)	378	0.28 0.5948	5707.89 0.000
Alfa Bank (maturing 2007)	**.2861345 (.0786905)**	**148**	**13.22 0.0004**	**82.30 0.000**
Alfa Bank (maturing 2008)	**.0392249 (.0270214)**	**106**	**2.11 0.1496**	**1264.24 0.000**
Bank of Moscow (maturing 2009)	-.0037791 (.0037581)	253	1.01 0.3156	71339.24 0.000
Bank of Moscow (maturing 2010)	.0009355 (.0066574)	135	0.02 0.8885	22520.21 0.000
GazPromBank	***.917046 (.1097049)***	***277***	***69.88 0.000***	***0.57 0.4502***
RosBank (maturing 2009 – 1)	**.3699173 (.2376185)**	**109**	**2.42 0.1225**	**7.03 0.0092**
RosBank (maturing 2009 - 2)	**.0559783 (.029204)**	**209**	**3.67 0.0566**	**1044.91 0.000**
VneshTorgBank (maturing 2011)	**.2229343 (.0644359)**	**241**	**11.97 0.0006**	**145.43 0.000**
VneshTorgBank (maturing 2035)	**.7916432 (.0472635)**	**107**	**280.55 0.000**	**19.43 0.000**

Chemical				
Amtel (maturing 2007, RUR)	***1.148358 (.6728932)***	***311***	***2.91 0.0889***	***0.05 0.8256***
Amtel (maturing 2007, USD)	**.2041827 (.099545)**	**99**	**4.21 0.0429**	**63.91 0.000**
Amtelshinprom	-.0249498 (.0674999)	392	0.14 0.7119	230.57 0.000
Nikoshim	1.153102 (2.775832)	359	0.17 0.6781	0.0 0.9560
Salavatnefteorgsyntez (maturing 2006)	**.1069344 (.0732666)**	**311**	**2.13 0.1454**	**148.58 0.000**
Salavatnefteorgsyntez (maturing 2009)	**.4551024 (.1255228)**	**128**	**13.15 0.0004**	**18.84 0.000**
Communication				
Bashinformsvyaz (maturing 2005)	.1219164 (.1893877)	360	0.41 0.5202	21.50 0.000
Centralnyi telegraph (maturing 2006)	**.2477975 (.171722)**	**342**	**2.08 0.1499**	**19.19 0.000**
CentrTelecom (maturing 2003)	-.0867875 (.2138072)	158	0.16 0.6854	25.84 0.000
Megafon	-.0030852 (.0204444)	228	0.02 0.8802	2407.28 0.000
MTC	**.4325381 (.0558199)**	**406**	**60.04 0.000**	**103.35 0.000**
Smart	-.3527767 (.4631862)	258	0.58 0.4470	8.53 0.0038
UTK	**.2049281 (.0883448)**	**389**	**5.38 0.0209**	**80.99 0.000**
VimpelCom	***.5831599 (.2903887)***	***242***	***4.03 0.0457***	***2.06 0.1525***
Construction				
Glavmoststroi Finance	***.6032582 (.3524436)***	***265***	***2.93 0.0881***	***1.27 0.2613***
Iskitimtsement	.0778824 (.1594995)	160	0.24 0.6260	33.42 0.000
Kamskaya Dolina Finance	.2470999 (.5054762)	116	0.24 0.6259	2.22 0.1391
Lenstroimontazh	-.0186974 (.035084)	142	0.28 0.5949	843.09 0.000
Peresvet	**.2802853 (.0965074)**	**138**	**8.43 0.0043**	**55.62 0.000**
Tsun	***.6838243 (.4592023)***	***92***	***2.22 0.1399***	***0.4929 0.47***

Electric power				
BashkirEnergo	.4912898 (.3826193)	319	1.64 0.2011	1.77 0.1849
FSK (maturing 2007)	**.2759703 (.0564347)**	**182**	**23.91 0.000**	**164.60 0.000**
GT TETS Energo (maturing 2006)	**.2217363 (.0539347)**	**447**	**16.90 0.000**	**208.22 0.000**
Lenenergo	.0231031 (.2680209)	193	0.01 0.9314	13.28 0.0003
RAO UESR	.0316518 (.0289973)	405	1.19 0.2757	1115.18 0.000
Yakutskenergo	.1304039 (.1188037)	146	1.2 0.2742	53.58 0.000
Engineering				
Arsenal	-.0221157 (.0993504)	129	0.05 0.8242	105.84 0.000
IAPO	.0024504 (.0082939)	378	0.09 0.7678	14466.04 0.000
Izh	**.1851666 (.1192563)**	**219**	**2.41 0.122**	**46.68 0.000**
Kamaz	-.00261 (.0098367)	261	0.07 0.7910	10388.77 0.000
MiG	**.0618571 (.0332413)**	**278**	**3.46 0.0638**	**796.49 0.000**
Russian Autobuses-finance	**.1937562 (.1133447)**	**384**	**2.92 0.0882**	**50.60 0.000**
Salut Energia	.0656223 (.127343)	159	0.27 0.6071	53.84 0.000
SOK Avtocomponent	.1007709 (.1693762)	91	0.35 0.5534	28.19 0.000
UHM	.2611858 (.3768662)	501	0.48 0.4886	3.84 0.0505
Uralvagonzavod	-.0039005 (.0328462)	185	0.01 0.9056	934.14 0.000
Vagonmash	-.0606657 (.5481044)	100	0.01 0.9121	3.74 0.0558
VAZ (maturing 2005)	**.1207624 (.0792193)**	**88**	**2.32 0.1310**	**123.18 0.000**
VAZ (maturing 2008)	**.13963 (.0619321)**	**327**	**5.08 0.0248**	**192.99 0.000**
Food				
Bakery #28	.1102688 (.4621343)	143	0.06 0.8118	3.71 0.0562
Efko	**.4088973 (.1562814)**	**269**	**6.85 0.0094**	**14.31 0.0002**
Kristall Finance	.33269 (.2702172)	198	1.52 0.2197	6.1 0.0144
Krasnyi Vostok-Invest	**.0753349 (.0371095)**	**318**	**4.12 0.0432**	**620.87 0.000**

MKShV	-1.152172 (1.10797)	189	1.08 0.2997	3.77 0.0536
OGO AIC	-.0767653 (.2175837)	303	0.12 0.7245	24.49 0.000
OST Group	**.0218934 (.0086288)**	**319**	**6.44 0.0116**	**12849.21 0.000**
Parnas	.0676715 (.4056129)	382	0.03 0.8676	5.28 0.0221
Pit	**.1344575 (.0579778)**	**359**	**5.38 0.0210**	**222.87 0.000**
Rosinter Restaurants	.016973 (.0192614)	378	0.78 0.3788	2604.69 0.000
Tinkoff	**.0132254 (.0079892)**	**289**	**2.74 0.0989**	**15255.56 0.000**
Wimm-Bill-Dann	.0081284 (.0455471)	458	0.03 0.8584	474.23 0.000
Metals				
ChTPZ	**.5643616 (.1212572)**	**92**	**21.66 0.0000**	**12.91 0.0005**
Evrazholding (maturing 2006)	**.4253624 (.1686378)**	**371**	**6.36 0.0121**	**11.61 0.0007**
Evrazholding (maturing 2009)	.0045741 (.0043883)	255	1.09 0.2983	145.24 0.000
MMK (maturing 2005, EUR)	***1.308998 (.0176292)***	***249***	***5513.28 0.000***	***307.22 0.000***
MMK (maturing 2008, USD)	**.1220912 (.0428104)**	**404**	**8.13 0.0046**	**420.53 0.000**
Russian Aluminium Finance	**.0565745 (.0215327)**	**458**	**6.9 0.0089**	**1919.63 0.000**
SeverStal (maturing 2009)	**.0850692 (.0393991)**	**349**	**4.66 0.0315**	**539.27 0.000**
SeverStal (maturing 2014)	**.1464782 (.0371052)**	**147**	**15.58 0.0001**	**529.13 0.000**
Svobodiy Sokol	-.2125936 (.1779662)	293	1.43 0.2332	46.43 0.000
TMK	**.1098146 (.0736206)**	**126**	**2.22 0.1383**	**146.21 0.000**
Uglemet Trading	**.0122303 (.007374)**	**437**	**2.75 0.0979**	**17943.32 0.000**
OMC	**.0889671 (.0511322)**	**91**	**3.03 0.0853**	**317.45 0.000**
Mining				
Alrosa (maturing 2005)	**.0373838 (.0245295)**	**413**	**2.32 0.1283**	**1540.03 0.000**
Alrosa (maturing 2008)	**.132064 (.0495838)**	**469**	**7.09 0.0080**	**306.41 0.000**
Alrosa (maturing 2014)	**.2918362 (.0519523)**	**236**	**31.55 0.0000**	**185.80 0.000**
Kuzbassrazrezugo	**.2333581 (.1490728)**	**107**	**2.45 0.1205**	**26.45 0.000**
Severalmaz	.1340209 (.1005525)	168	1.78 0.1844	74.17 0.000

Oil & Gas				
Gazprom (maturing 2007, USD)	**.2046083 (.0934826)**	**475**	**4.79 0.0291**	**72.39 0.000**
Gazprom (maturing 2009, USD)	**.1514529 (.0893533)**	**471**	**2.87 0.0907**	**90.18 0.000**
Gazprom (maturing 2010, EUR)	**.4283123 (.0625011)**	**416**	**46.96 0.0000**	**83.66 0.000**
Gazprom (maturing 2013 - 1, USD)	**.3717681 (.0359809)**	**469**	**105.98 0.000**	**302.64 0.000**
Gazprom (maturing 2013 – 2, USD)	**.4278848 (.1117058)**	**108**	**14.67 0.0002**	**26.23 0.000**
Gazprom (maturing 2013 - 3, USD)	**.5196721 (.0609349)**	**108**	**72.73 0.000**	**62.14 0.000**
Gazprom (maturing 2015, EUR)	**.8240049 (.0457177)**	**148**	**324.16 0.000**	**14.57 0.0002**
Gazprom (maturing 2020, USD)	**.2331393 (.0863716)**	**266**	**7.29 0.0074**	**78.83 0.000**
Gazprom (maturing 2034, USD)	**.8944318 (.0301021)**	**302**	**882.88 0.000**	**12.3 0.0005**
Northgas-Finance	.1652588 (.1370879)	234	1.45 0.2292	37.08 0.000
Novatec	***.973284 (.4160333)***	***97***	***5.47 0.0214***	***0.0 0.9489***
Sibneft (maturing 2007)	**.2371967 (.0605212)**	**452**	**15.36 0.0001**	**158.86 0.000**
Sibneft (maturing 2009)	**.2385047 (.0448451)**	**471**	**28.29 0.000**	**288.34 0.000**
TNK	**.2478102 (.0645398)**	**471**	**14.74 0.0001**	**135.83 0.000**
Other				
Afk Sistema	**.0770392 (.0459142)**	**462**	**2.82 0.0940**	**404.09 0.000**
Avtoban	-1.318166 (3.405414)	156	0.15 0.6992	0.46 0.4971
Eliseev Palace Hotel (maturing 2007)	.1251935 (.2446118)	222	0.26 0.6093	12.79 0.0004
Eliseev Palace Hotel (maturing 2009)	-.0090229 (.1102787)	203	0.01 0.9349	83.72 0.000
RosPechat'	**.2331214 (.0671231)**	**202**	**12.26 0.0006**	**130.53 0.000**
SUEK	.088911 (.278506)	277	0.1 0.7498	10.7 0.0012
Textile				
Alliance Textile (maturing 2006)	**.2411403 (.0534585)**	**405**	**20.35 0.0000**	**201.51 0.0000**
Alliance Textile (maturing 2009)	**.4995414 (.3075845)**	**142**	**2.64 0.1066**	**2.65 0.1060**

Timber				
North-west timber company	***.6478014 (.3689621)***	***112***	***3.08 0.0819***	***0.91 0.3419***
Pef	-.6545471 (1.050428)	256	0.39 0.5338	2.48 0.1165
Volga	.083488 (.0875335)	270	0.91 0.3410	109.63 0.000
Trade				
Adamant	**.2418054 (.1355739)**	**100**	**3.18 0.0776**	**31.28 0.000**
Euroset	**.2140775 (.076248)**	**190**	**7.88 0.0055**	**106.24 0.000**
Inprom (maturing 2007)	**.373449 (.2030099)**	**225**	**3.38 0.0672**	**9.53 0.0023**
JFC International (maturing 2005)	.3084228 (.9383545)	121	0.11 0.7430	0.54 0.4626
JFC International (maturing 2007)	-.1465801 (.8511997)	159	0.03 0.8635	1.81 0.1799
Marta	.0091717 (.0801276)	118	0.01 0.9091	152.91 0.000
Novie Cheremushki	**.2730612 (.1821012)**	**291**	**4.84 0.0286**	**261.04 0.000**
Pyaterochka Finance	***.699717 (.4425677)***	***98***	***2.5 0.1171***	***0.46 0.4991***
Transport				
East Line Handling	.0515837 (.1214091)	113	0.18 0.6717	61.02 0.000
RzhD (maturing 2007)	**.3195738 (.1321937)**	**154**	**5.84 0.0168**	**26.49 0.000**
RzhD (maturing 2009)	**.4105985 (.0683496)**	**202**	**36.09 0.000**	**74.36 0.000**
Samara Aircompany	**.1138942 (.0605651)**	**315**	**3.54 0.0610**	**214.06 0.000**
Transnefteproduct	**.1190046 (.0715452)**	**288**	**2.77 0.0973**	**151.63 0.000**

Municipal				
Irkutsk Region	**.1386793 (.0710109)**	**253**	**3.81 0.0519**	**147.12 0.000**
Belgorod Oblast	**.1203192 (.078966)**	**455**	**2.32 0.1283**	**124.10 0.000**
Karelia	**.053005 (.0293146)**	**244**	**3.27 0.0718**	**1043.59 0.000**
Krasnoyarsk	**.3582062 (.0973811)**	**197**	**13.53 0.0003**	**43.44 0.000**
Moscow (maturing 2006)	**.1570621 (.0745285)**	**438**	**4.44 0.0357**	**127.92 0.000**
Moscow (maturing 2011, EUR)	**.1652131 (.0402277)**	**244**	**16.87 0.0001**	**430.63 0.000**
Novosibirsk	**.2018948 (.1029184)**	**178**	**3.85 0.0514**	**60.14 0.000**
Saint-Petersburg (maturing 2008)	**.1243839 (.034531)**	**471**	**12.98 0.0003**	**643.00 0.000**
Saint-Petersburg (maturing 2011)	**.0942761 (.0277844)**	**466**	**11.51 0.0008**	**1062.65 0.000**

First of all, many more issues show clear picture for Russia than for Ukraine. Agricultural bonds show less than full risk transfer although in only 1 case we can reject the $\beta=0$ hypothesis. Interesting enough, in banking & finance industry only for GazPromBank we are not able to reject $\beta=1$, implying possible full risk transfer. Another interesting example is in chemicals. The Amtels' ruble-denominated issue shows full risk transfer which is supported by test. At the same time its dollar-denominated counterpart shows only 20% risk transfer. In communications we can reject $\beta=1$ for all issues except for the VimpelCom. With its coefficient showing only 58% risk transfer we still cannot reject the hypothesis that the coefficient may be 1 on the basis of the test. A similar picture is in the oil & gas industry where only Novatec has a coefficient of 0.97 and s.e. of 0.416. Thus we are not able to reject the hypothesis that $\beta=1$. All other issues show less than full risk transfer. Timber and trade industries also have one issue each where the hypothesis of 100% risk transfer cannot be rejected, although they all have coefficients smaller than 1. There are 2 issues in construction that have coefficients less than 1 but still we cannot reject $\beta=1$ hypothesis. For all bonds in the engineering industry the hypothesis of the full risk transfer can be rejected. The same is for food industry. Although in the latter we able reject $\beta=0$ only in 5

cases out of 12. In metals, mining, and transport we also reject one, not always being able to reject zero. Transport as well as in Ukraine includes a state railways monopolist RzhD which shows less than 100% risk transfer. Centralnyi telegraph is another state company presented in the communications. In municipals in all cases we are able to reject both 0 and 1. The coefficients in this group are far below 0.5.

Note that among all issues examined for all 3 countries only 3 coefficients are larger than 1 (MMK, Amtel and Garant). In the case of MMK we also reject one as well as zero; with coefficient equal 1.3, it shows that the risk transfer is possibly greater than 1. That is, the 1 point change in yield of government bond would be associated with more than 1 point change in yield provided by this particular issue. However, in the vast majority of examined cases we are able to reject the null hypothesis that $\beta=1$ supporting the idea of the risk transfer less than 100% from government to corporate security. The same conclusion can be applied to the corporate bonds of Ukraine and Kazakhstan.

We suspect that daily spread changes may not provide a clear picture since the reaction of corporate bond's yield on government's one may not be instant and require longer time intervals to take place. Therefore, we select the longest issues (the issues with number of days traded more than or equal 200) and redo the regression analysis together with the t-test specifying the change in spread as a 10-day difference. We take exactly 10 days because there are 5 trading days in a week. Durbin and Ng whose methodology we follow use monthly changes to do the difference in spreads. However, they have data for 6 consecutive years. We do not enjoy such a long time span and thus use two changes per month. The only purpose of regressing in such a way modified data is to check whether the coefficients will increase. Tables in Appendix 1 provide with the regression results with the spread being as a 10-days difference. The overall picture is the

same. There are still many issues with beta coefficients such that we cannot reject neither 0 nor 1. Due to the increase in the number of days used to compute the spread, for some issues we cannot reject zero anymore (e.g. ChernomorNaftoGaz) and for some, in contrast, we can (e.g. Svobodiy Sokol). However, there are only few issues showing such performances. The most part of the issues with coefficients between 0 and 1 under 1-day change in spread remained between 0 and 1 under 10-day change in spread specification. This fact leads to the conclusion that even if there exists an omitted variable reflecting the liquidity (or illiquidity of some bonds) it does not influence the regression results significantly. Comparing pairs of bonds with 1-day change in spread specification and 10-day one, we can see that in most cases the coefficients indeed increased. This suggests that the hypothesis that the "longer" the change in spread, the greater the coefficient, may be true. For instance, the coefficient with PetroKazakhstan has increased two times and now accounts for 0.093 meaning that 9.3% of the additional risk will be on average transferred from the government to the corporate bond. For Kiev'11 we cannot already reject the hypothesis that $\beta=1$ although for one maturing 2008 this is still the case. Again, the coefficient with the issue maturing later is greater supporting the idea that the further the maturity, the greater is the coefficient. In the case of the South-West Railways we cannot already reject that the coefficient is zero. The coefficient with Izh became greater than 2 and we clearly reject 0 as well as 1. Kamaz and MiG also have coefficients greater than one but in these cases we do not reject neither 0 nor 1. In contrast with previous findings VimpelCom shows now only 40% risk transfer and we can reject both 0 and 1. Also for Efko and OGO AIC we cannot reject the hypothesis that $\beta=1$. Interestingly, the coefficient with MMK'05 becomes less than 1 but we still cannot reject its beta being equal 1. The same applies to the MMK'08, Svobodniy Socol, and Uglemet Trading. In oil & gas we cannot reject the $\beta=1$ hypothesis for 3 more large private companies. One important note should be done here. We can clearly see that the number of

coefficients larger than 1 for which we can reject the hypothesis that $\beta=0$, have increased from 3 to 9, although less issues were employed in the second part of the analysis. We would also like to construct 20-day changes in spreads as Durbin and Ng [2002] did in order to verify further the hypothesis that increasing the time interval for the change in spread leads to the increase in coefficients. However, the data limitations do not allow us to implement this analysis.

In the majority of the individual regressions the maturity difference dummy variable appeared to be insignificant. However in several cases the dummy variable appeared to be significant. In many cases where the dummy is significant, its incremental value is rather a small one and do not introduce much of new information (Gazprom, maturing 2013 – 1). Although sometimes the dummy variable showed to be significant with a rather high negative coefficient, mostly it is the case with insignificant beta coefficients for government spread. The R^2 varies substantially with most issues showing really small value of explanatory power, although some pairs (e.g. Gazprom, MMK) have rather high R^2. To check for the autocorrelation problem among the individual issues we employed the Durbin-Watson d test. For more information concerning R^2, dummy variables and DW d statistics, see Appendix 2.

To analyze the issue further we have pooled the data. Namely, the data on all companies of one particular industry for each country were pooled together to estimate the industry-average β-coefficients. The following table provides the estimates (industries where the both hypotheses of 100% risk transfer and 0% risk transfer can be rejected are marked **bold**).

Table 4 – Industry regression results

Industry Name	β–Coefficient (se)	# of obs	Test	
			β=0	β=1
			X^2, Prob> X^2	X^2, Prob> X^2
Kazakhstan				
Banking & Finance	**.1583925 (.0085761)**	**3298**	**341.11 0.000**	**9630.39 0.000**
Oil & Gas	**.0429709 (.0213605)**	**863**	**4.05 0.0443**	**2007.36 0.000**
Ukraine				
Banking & Finance	-.0332098 (.3055099)	2269	0.01 0.9134	11.44 0.0007
Chemical	.3890037 (.7443311)	284	0.27 0.6012	0.67 0.4117
Communication	.2161971 (.1692901)	674	1.75 0.1860	21.02 0.000
Construction	-.119507 (.5194327)	1129	0.05 0.8180	4.65 0.0311
Electric power (EnergoAtom)	-.0159564 (.7620934)	175	0.00 0.9833	1.78 0.1842
Engineering (Lutzk Autoplant)	-.0696095 (1.25461)	105	0.0 0.9559	0.73 0.3959
Food	-.3822975 (2.501729)	2550	0.02 0.8785	0.31 0.5806
Metals	-.9783943 (5.40782)	500	0.03 0.8564	0.13 0.7145
Oil & Gas	**.4386389 (.1280397)**	**480**	**11.74 0.0006**	**19.22 0.000**
Other (Stal'kanat)	**.3898107 (.0899663)**	**391**	**18.77 0.000**	**46.0 0.000**
Trade	.506789 (1.079267)	1062	0.22 0.6387	0.21 0.6477
Transport	.0713842 (.0504872)	972	2.0 0.1574	338.31 0.000
Municipal	**.1236931 (.0263952)**	**987**	**21.96 0.000**	**1102.21 0.000**
Russia				
Agriculture	.0552104 (.0522373)	230	1.12 0.2906	327.12 0.000
Banking & Finance	**.5077931 (.0324101)**	**1963**	**245.48 0.000**	**230.64 0.000**
Chemical	.1018835 (.2791201)	1600	0.13 0.7151	10.35 0.0013
Communication	.0045449 (.023739)	2383	0.04 0.8482	1758.40 0.000
Construction	-.0147538 (.0203684)	913	0.52 0.4689	2482.03 0.000
Electric power	**.1605272 (.0774773)**	**1692**	**4.29 0.0383**	**117.40 0.000**
Engineering	.0018762 (.0067044)	3100	0.08 0.7796	22164.16 0.000

Food	**.0180144 (.0121427)**	**3605**	**2.2 0.1379**	**6540.04 0.000**
Metals	**.8149914 (.0128514)**	**3272**	**4021.63 0.000**	**207.24 0.000**
Mining	**.0772581 (.0201074)**	**1393**	**14.76 0.0001**	**2105.95 0.000**
Oil & Gas	**.3520987 (.0337983)**	**4488**	**108.53 0.000**	**367.47 0.000**
Other	.0782816 (.1435027)	1522	0.3 0.5854	41.26 0.000
Textile	**.2858869 (.0785148)**	**547**	**13.26 0.0003**	**82.72 0.000**
Timber	-.114772 (.4072628)	638	0.08 0.7781	7.49 0.0062
Trade	-.0899344 (0857245)	1302	1.1 0.2941	161.66 0.000
Transport	**.1163333 (0371879)**	**1072**	**9.79 0.0018**	**564.64 0.000**
Municipal	**.1292067 (.0199918)**	**2495**	**41.77 0.000**	**1897.25 0.000**

As can be seen from the table, we can clearly reject both hypotheses (about $\beta=0$ and $\beta=1$) for the two Kazakhstan industries. Note that the average risk transfer for the Banking & Finance industry is almost 3 times higher than for the Oil and Gas industry, and it amounts to nearly 16%. That is to say that if the government yield increases by 1 point, it leads, on average, to 0.16 point increase of the yield of bond issued by a company from the Banking & Finance industry. The same explanation applies to the Oil & Gas industry, leading to 0.043 point increase in corporate yield. On the one hand, this result goes contrary to intuition because Oil and Gas companies are tight to the natural resources and the later are highly controlled by the government thus leading to a conclusion of a rather high correlation with government. On the other hand, Durbin and Ng [2002] also find in their work that throughout the developing economies the Oil and Gas firms have lower spreads than their host governments, on average. Also, there is a theoretical support that banks may have relatively high beta coefficients facing higher transfer risk if the government considers them to be the most accessible source of foreign currency during the crisis. Hard currency revenues may also be an explanation for a violation of sovereign ceiling and having very low

coefficients for Oil and Gas industry. Companies selling the natural resources abroad and receiving profits in foreign currency may be involved in guaranteed loan agreements to secure future export revenues.

For Ukraine note first of all that two industries (Electric power and Engineering) are represented by a single company each. Thus the industry results coincide with the individual regression's results. The Other industry includes 2 bond issues of one issuer, Stal'kanat, which is highly connected to the Metal industry. Also note that there is no single industry where we can reject the hypothesis of $\beta=0$ and at the same time can not reject $\beta=1$. In all 6 cases (all of them being Ukrainian: Chemical, Electric power, Engineering, Food, Trade, Metals) where we can not reject the 100% risk transfer, we can not reject the 0% risk transfer as well. Variations of coefficients throughout the industries are rather large as well as the standard errors of the industry-average coefficients. For 3 Ukrainian industries we can clearly reject both 0% and 100% risk transfers. From those Municipal can be seen as a part of government. The explanation for Oil & Gas industry may the same general one used in case of Kazakhstan. And the Stal'kanat is the only company in the Other industry, as was already mentioned. In case of the rest 4 industries (including the Banking & Finance one) we can not reject the null that there is a 0% risk transfer although clearly rejecting the 100% risk transfer.

The picture with Russian bonds is rather different from the Ukrainian one. To begin with, in all the cases we can reject the hypothesis of full risk transfer since $\beta=1$ is rejected for all 17 industries. Of them, in 9 cases we can reject also the hypothesis of no risk transfer which leaves us with coefficients between 0 and 1. The highest one is with the Metals industry (0.81). The Banking & Finance industry also has relatively high coefficient of 0.5 supporting the idea that banks may more vulnerable to the government payment crisis. As with the cases of Kazakhstan and Ukraine, Oil & Gas industry gives the coefficient lower 0.5

implying that less than a half of an additional risk from a government bond will be transferred to the corporate one. However, there is one major distinction between the 3 country's industries. While Kazakhstan gives a beta of 4.3%, Ukraine and Russia give 44% and 35%, respectively. The estimation of beta for Municipal bonds gives the coefficient of 0.13 which is roughly the same as for Ukrainian municipals. For the rest of 8 bonds we can reject the null of $\beta=1$ but not the one of $\beta=0$ implying no risk transfer.

Then we pool all industries of one country to estimate the average coefficient for each country in general. First we pool all industries and do not include the municipal bonds to check the coefficient of only corporate issues together. Later we add municipal bonds where they are available. The following table summarizes.

Table 5 – Country regression results

Country Name	β–Coefficient (se)	# of obs	Test	
			β=0	β=1
			X^2, Prob> X^2	X^2, Prob> X^2
Corporate issues				
Kazakhstan	**.1332188 (.0081684)**	**4161**	**265.98 0.000**	**11260.14 0.000**
Ukraine	-.077486 (.6951998)	10591	0.01 0.9113	2.4 0.1212
Russia	**.2502594 (.0070662)**	**29720**	**1254.33 0.000**	**11257.76 0.000**
Corporate and municipal issues				
Ukraine	-.0658153 (.6447425)	11578	0.01 0.9187	2.73 0.0983
Russia	**.2498408 (.0067378)**	**32665**	**1374.96 0.000**	**12395.70 0.000**

As expected, Kazakhstan shows a coefficient significantly different from both 0 and 1. Russian beta amounts to 0.25 and Ukraine shows that the coefficient is not

statistically different from 0 although being different from 1 (employing 15% level of significance, as previously). The addition of municipal bonds does not change result dramatically. From a statistical point of view the fact that we cannot reject the beta being equal 0 for Ukraine is due to the large number of industries which showed a 0-correlation with government securities. The question on why there is no risk transfer for bonds of so many Ukrainian companies need further investigation and is somewhat beyond the scope of this paper. However some propositions may be made, e.g. the investors holding the Ukrainian government bonds and bonds of Ukrainian food companies belong to absolutely different groups of investors; meaning that the investor from one group will never buy a bond that is usually purchased by the investor from another group making these bonds not substitutes at all. The fact that we can not reject the zero coefficient for so many Ukrainian companies, industries and the country as well may be an indication of a violation of the rule of "sovereign ceiling" by itself. Having no correspondence between the changes in yield spreads of companies' securities with the ones in the government securities signalizes that the risk transfer should be questioned. Generally we do not observe that investors believe in the 100% risk transfer and the justification of the rule of "sovereign ceiling" that whenever the government defaults, the firm defaults too. As the estimation results of individual regressions suggest, we may consider the "sovereign ceiling" to be used as a rule of thumb. On the industry level there are also cases where we cannot reject beta of 1 hypothesis. In contrast, the country-average coefficients suggest that on average the risk transfer is much lower than 100% (for Kazakhstan and Russia) or is not an issue (the case of Ukraine).

As we were doing cross-sectional time-series analysis, we used the Hausman test to chose between fixed and random effects model. We would expect using the random effects models since we may have omitted variables that may be constant over time but vary between cases as well as they may be fixed between cases but

vary over time. Thus we use the Hausman test as a formal rule. The test confirmed random effects model to be appropriate (see Appendices 3). The R^2 for pooled data estimation are reported in the Appendix 4.

Chapter 5

CONCLUSIONS

This paper investigated the appropriateness of the so-called rule of 'sovereign ceiling' for the CIS countries. The practice of 'sovereign ceiling' is a long-standing tradition of credit agencies saying that no company is more creditworthy that its home government. This automatically implies that no private corporation can receive a credit rating from a credit agency better (higher) than the one received by the company's government. The justification of the rule is that whenever the government defaults, the firm defaults too. By applying this rule practitioners adjust for a country risk while implementing their investment projects in the emerging markets. It is naturally to question whether this rule is appropriate for the CIS bond markets and the Ukrainian one in particular. Saying it differently, we ask to what extent the government default probability is incorporated into the corporate risk premium. If the risk transfer is less than 100%, then it might happen that investors evaluate the prospects of a particular company higher than of company's government. Therefore, if the rationale of sovereign ceiling is strictly believed by investors then the change in yield of a sovereign bond will be associated with at least as great a change in the yield of a similar corporate bond.

Although we may conclude that the rule of "sovereign ceiling" may be applicable as the rule of thumb (there are issues that show greater than 1 risk transfer), generally there are as many issues supporting the argument that the justification of the rule (whenever the government defaults, the firm defaults too) is not applicable. Thus, as the current research shows, the rule of "sovereign ceiling" should not be applied to all companies of developing economies blindly. If

investors consider some company (e.g. one related to the natural resources' or the one getting revenues from abroad) being creditworthy enough such that its bonds are traded with lower spreads compared with the bonds of the company's government, then this company may be considered to receive a better (higher) credit rating than its government has, and thus the company can borrow cheaply.

This study investigates one of the sources of risk for corporate debt securities in the three CIS countries, Ukraine, Russia and Kazakhstan. The understanding of the government default risk is as essential for the investments in the emerging markets as the analysis of asset's prices. The future possible research could be investigating the common factors causing so many companies and industries to show the coefficient statistically not different from zero. Also, the government default probabilities should influence the stock market, since they are able to affect the riskiness of debt securities of the companies. Therefore the analysis of the interaction of the stock market with the government yields may be another field of investigation for the future.

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