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ECONOMIC CRISIS AND THE EQUITY RISK PREMIUM

UDC:336.761.6:338.124.4(100)

Abstract

Investing in stocks is a risky activity and accordingly investors require adequate compensation in the form of additional return to undertake investment over the risk free rate, called equity risk premium. It is a risky activity in developed countries, and even riskier in emerging markets that have young and underdeveloped capital markets and high volatility of stock returns. Our paper gave an overview of the risk premium earned in developed versus emerging markets. We have shown that the average stocks market return is double in emerging markets, but also double volatile, i.e. more risky. Emerging markets enable investors to achieve 4.3 times higher compensation for the risk undertaken in the form of a risk premium, which in emerging markets accounted for 10.78%, while in developed markets amounts to 2.49%. Measured by the Sharpe ratio, we prove that investors in emerging stock markets achieved dramatically better risk-return relationship.

The purpose of this paper is to observe the equity risk premium in the developed and emerging markets through the history (i.e. historical equity risk premium). We will show that the economic cycles, macroeconomic shocks, global liquidity and other macro phenomena (i.e. global financial market integration) has great influence on the equity risk premium. We will put a great focus on the impact of the economic crisis on the equity risk premium in emerging markets.

Key words: *equity risk premium, economics crisis, financial crisis, global liquidity*

JEL classification: E32, G01, G12, G15, F44, F65

1. Introduction

Macroeconomic trends have exceptionally strong influence on stock markets. Periods of economic distortions, followed by recession, as well as periods of economic boom are causing significant movements on the stock markets and increase volatility. Economic crisis through the history has definitely affected the increase in volatility of investment in shares. Moreover, in times of economic crisis it comes to an increase in risk aversion among market participants because of uncertainty about what will happen in the future. Therefore, it is logical that investors will demand higher compensation in the form of additional return for investing in stocks during economic downturns than during expansionary phases of the business cycle. That extra return that should stimulate investment is exactly the risk premium.

Classical financial paradigm, which Campbell (2007) refers to "old fashioned financial theory", under which the capital markets are efficient, and further more lay the foundation to build the most important models for valuation of the capital assets, assumes that the equity risk premium is constant. In fact the market risk premium[1] is not constant, nor small especially in emerging markets takes large values. Equity risk premium has time variation nature i.e. it varies over time showing drastic movements up and down, and that is related particularly with the business cycles, shocks and other macro phenomena, as it is the global market integration. In fact, we will show that during economic downturns it comes to a drop in stock market indexes, a drop in equity returns, and thus to a decrease in the equity risk premium which in these times becomes negative, and vice versa during the growth . This is far more dramatically expressed in the emerging markets that show greater volatility than developed markets. Thus, the analysis of the historical risk premium[2] will lead us to the illusory conclusion that in periods of economic crisis, when equity risk premium declines, comes to decreasing of the investors' risk aversion. Of course this is not the correct conclusion, and the pure economic logic suggest that risk aversion reduce in stable economic conditions, and the analysis of the expected risk premium can precisely capture this moment to us. Our analysis will put accent on the analysis of the historical risk premium, rather than expected or implied ERP, and we will try to explain the movement of the historical risk premium in the context of the business cycles.

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[1] In this paper we will use the terms equity risk premium, markets risk premium and risk premium as a synonyms

[2] We will make the difference between the four concepts of the equity risk premium, as defined by Fernandez (2007):

1. Historical Equity Premium (HEP): historical differential return of the stock market over treasuries.
2. Expected Equity Premium (EEP): expected differential return of the stock market over treasuries.
3. Required Equity Premium (REP): incremental return of the market portfolio over the risk-free rate required by an investor in order to hold the market portfolio1
4. Implied Equity Premium (IEP): the required equity premium that arises from a pricing model and from assuming that the market price is correct

We will put the most of our attention to the impact of a recent global financial crisis of 2007 - 2009, which had a great impact on the world economy, starting in the United States and further in all of the other developed economies, and spilled over, to some extent in the emerging markets. This crisis, among other things was a challenge for many researchers in the field of economics and finance, including this paper. Some of them are addressed explaining the reasons for the appearance of the crisis, as Allen and Gale (2007), Greenlaw et al. (2008), Mian and Sufi (2008), Reinhart and Rogoff (2008), Shiller (2008), and Jawadi (2009) and others. These studies relates the origin of the crisis mainly with: mortgage banks' strategies, the method for valuation of the assets and businesses, securitization, application of derivatives, and with the key macroeconomic factors such as interest rate and foreign exchange rates.

The financial crisis of 2007-2009, which began with the collapse of the financial system in the United States, quickly spread and engulfed the whole world and therefore it is known as a global financial crisis or just the 2008 financial crisis. According to its magnitude, many economists declared it the worst economic crisis since the Great Depression of the 1930s. It resulted in the threat for a total collapse of the major financial institutions, and in attempts for saving the banks in developed countries by state aid, particularly in the United States, but this effect did not appear or was not pronounced of this magnitude in emerging markets due to the great stability of the banking sector. But the sharp drop in stock prices happened anywhere in the world and this effect expand in emerging markets. Figure 1 clearly depicts this situation, where it can be seen the close correlation in the movement of the value of the emerging markets index, developed markets index and global index (represented with MSCI Emerging Markets Index, MSCI G7 Index and MSCI World Index respectively).

Figure 1. The value of the stock market indices
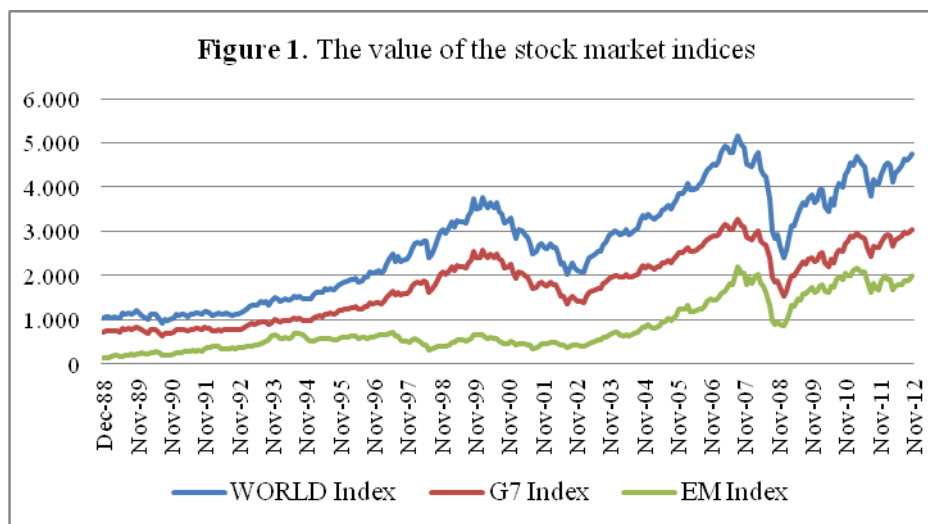
Source: MSCI

The active phase of the crisis, which manifested itself as a liquidity crisis, started from August 7, 2007, when, as pointed out by Elliott (2012) one of the largest banks, BNP Paribas with headquartered in Paris, terminated withdrawals from three hedge funds

indicating "complete evaporation of liquidity". But as an official start of the crisis it is considered the bankruptcy of one of the largest banks in the U.S., the Lehman Brothers. Figure 1 clearly shows the beginning of the fall of the indices around the world since August 2007.

The consequences of this were the real estate market crisis in the U.S. and other developed countries, bankruptcies of many businesses in the real sector, an increase in unemployment in the U.S. and other developed countries and drastic decline in living standards of the population in those countries. Some of these effects had reflected in emerging markets, although not with such magnitude as in developed countries. The ultimate effect was a sharp decline in global economic activity which led to the 2008-2012 global recession and caused the European debt crisis.

Monetary interventions by the governments in the developed countries throughout the world, with coordinated fiscal stimuli that were aimed at financial support of the real economy, encouraging of consumption, increasing the liquidity of the financial systems across the state borders and the recapitalization of troubled banks, has led to the stabilization of the world economy in the second quarter of 2009. This led to a decrease in risk aversion and increasing investor optimism. Thus, benchmarks for global risks have improved, as Revoltella, Muci and Mihaljek (2010) show a dramatic reduction in credit default swap spreads in the case of the emerging markets of Central and Eastern Europe. The general trend of decreasing risk premiums was interrupted by escalating public debt crisis in some countries in the Eurozone.

This paper aims to provide a view of the historical equity risk premium. The paper is structured as follows. Part one is introductory. The second part of the paper gives a view of the most significant achievements in the literature in this field, and would be addressed the most quoted authors relating and explaining the movement of the market risk premium with the business cycles. The third section provides a description of the data that will be used in our paper and define the historical risk premium as the difference between the realized annual returns of the stock market portfolio and the risk free rate of return. In the fourth part we systematize the results of our research. First we give an explanation of the risk premium through the measures of descriptive statistics. We show that the risk premium is 1) drastically greater in emerging markets than in developed markets, 2) more volatile in the emerging markets, but investing in stocks in these countries provides a better return per unit risk, 3) is not constant over time as it assumes the classical financial paradigm. We explain the time variation of the equity risk premium with the movement in the business cycles. We show the relationship between the risk premium and industrial production and especially the relationship with global liquidity. The fifth section provides concluding remarks.

2. Literature review

Many authors have proved the great connection between the economic crisis and the market risk premium. Thus, Rietz (1988) takes the probability of major catastrophic events to explain the higher risk premiums, and Barro (2006) makes extension of this argument. In this last paper the catastrophic risk is modeled through the GDP decline

and partial defaults in governments' borrowings. Gabaix (2009) expanded the Barro-Rietz model with the inclusion of time-varying losses during the disaster. Barro, Nakamura, Steinsson, and Ursua (2009) used panel data for 24 countries for more than 100 years in their study of the empirical effects of economic shocks. They found that the average duration of economic shocks is six years and that half of the short-term impact of economic shocks is reversed in the long run. Exploring the impact of crises on the valuation of assets, they conclude that the effects on the risk premium depends on investor utility functions, with some utility functions, such as power utility function, produce lower risk premium, while others generate very high risk premiums. Barro and Ursua (2008) carried out research on crises through history and found 87 crises by 2007 (today this number is greater), with an average impact on the stock prices of 22%, and estimated that investors need to generate a risk premium of 7% as compensation for undertaking the risk.

Lettau, Ludwigson and Wachter (2007) made extensive research of the time varying nature of the equity risk premium and shifting volatility in the real economy in the case for USA. They were searching for the explanation of the high equity values in the 1990es. They found that the fall in macroeconomic risk, or the volatility of the aggregate economy as an explanation. Empirically, they find a strong correlation between low-frequency movements in macroeconomic volatility and low-frequency movements in the stock market. More precisely, the reduced volatility in real economic variables including employment, consumption and GDP produced low equity risk premium and high equity values. Hence, they confirm the pure economic logic that the equity risk premium should be lower in a stable macroeconomics condition, in economy with predictable inflation, interest rates and economic growth, rather than in periods where the real macroeconomic variables are volatile and unpredictable. In their paper they are using the figure 2 shown bellow, to depict the correlation between the volatility in GDP growth and the dividend/price ratio which they use as a measure for the equity risk premium.

Damodaran (2012) was searching for correlation between the implied equity risk premiums that he estimated for the S&P 500 and three macroeconomic variables – real GDP growth for the US, inflation rates (CPI) and exchange rates (trade weighted dollar), using data from 1973 to 2011. He found that the only macroeconomic variable that seems to be correlated with equity risk premiums, at least over this time period, is inflation, with higher inflation going hand in hand with higher equity risk premiums.

There are other authors searching for a relation between the equity risk premium and inflation. Besides, most of them found little or no relationship as note by Damodaran (2012). Brandt and Wang (2003) are one of those who confirm the relevance of the news about inflation that dominates news about other variables as are the real economic growth and consumption in determining risk aversion and risk premiums.

Arouri and Jawadi (2010) explore the market risk premium in the United States during the economic crisis. In fact they follow the evolution of the expected risk premium in periods of economic crisis. They found a large growth of the global risk premium precisely in periods of significant economic disturbances: the oil crisis (1973-1974), the monetary experiment (1979 - 1982), Gulf War (1991-2003), crises in emerging

countries (1992, 1993, 2001) and the terrorist attack (2001). Most importantly, the recent global economic and financial crisis (2007-2009) led to a significant increase in the world price of risk which indicates a reasonable lack of confidence about the future of financial markets. Furthermore, they found that the systematic risk in the U.S. was significantly higher in this period of economic distortions, especially in the period of financial crisis (2007-2009). Accordingly, the premium raised in those periods.

Figure 2. Volatility in GDP growth and equity risk premium in USA
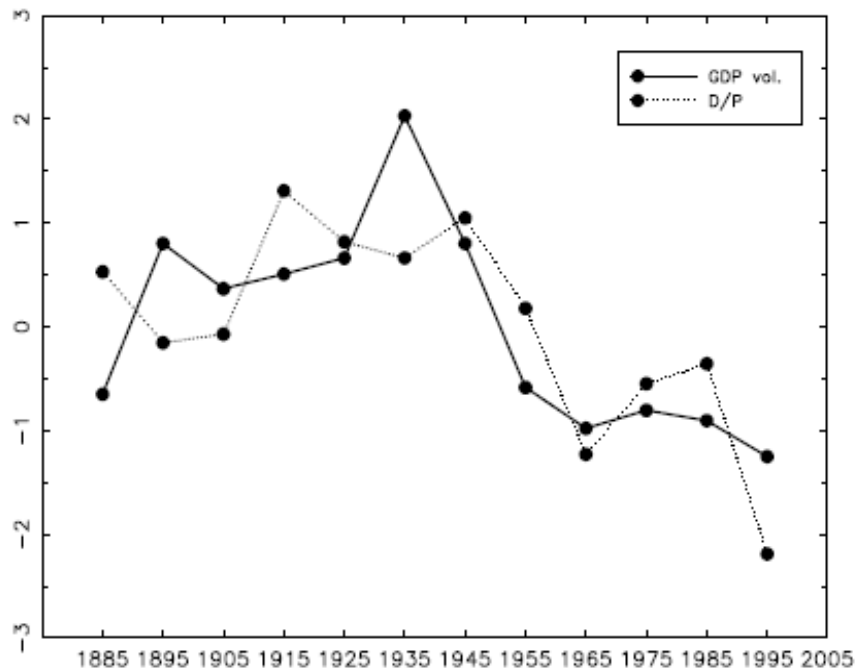
Source: Lettau, Ludwigson and Wachter (2007), page 1661

As noted by Damodaran (2012), concerning the great financial crisis of 2008, the risk premiums have increased significantly in the first weeks of the crisis. But the series of macroeconomic crises in the last four years that have an impact on all markets in the world leads to the hypothesis that globalization may increase the frequency and probability of major economic shocks and as a result the equity risk premium. He further shows that between September 12 and October 16, 2008, the year of the great world banking and financial crisis, the indices of all the world's stock markets move up and down in the same manner, with emerging markets showing slightly larger volatility.

Specifically, Damodaran (2012), found that the geometric average risk premium in the United States at the end of 2007 amounted to 4.79%, and at the end of 2008 was lower, amounting 3.88%, and in fact in all countries analyzed the situation is the same if we stop analysis in 2007 compared with 2008. Adding the data for 2008, which was extremely bad year for stocks and good year for bonds, reduces EPR dramatically, even

when applied to extremely long period of time. Thus, the approach of historical ERP will lead investors to conclude that, after one of the biggest stock market crises in recent decades, stocks become less risky than in the pre-crisis period and they need to seek lower premiums. However, by adding the data to the next, 2009 year, the average historical ERP again goes up due to higher realized growth of the stock market returns. Unlike the historical EPR, in January 2008 he estimated the implicit risk premium for the whole 2008 which amounted to 4.46% and is higher than the realized ERP at the end of 2008 (which amounted 3.88%). In January 2009 he estimated the implicit ERP for the 2009 of 6.43%, but the realized historical ERP at the end of 2009 was 4.29%. Namely, the size of the implicit risk premium gets credible conclusion that the increased risk of the stock market should result in a higher risk premium because the implicit risk premium is a result of investors' expectations and their request for compensation for taking the most risk. If we observe the historical EPR we will get the wrong idea that economic crises affect the reduction of risk aversion, i.e. that stocks become less risky than in the pre-crisis period and they need to seek lower premiums.

John R. Graham and Campbell R. Harvey from the Duke University in the United States continuously conduct a survey of CFOs in the U.S. starting from the third quarter of 1996 to the present. Graham and Harvey (2013) show the summarized data for the expected risk premium for the period starting in June 2000 to December 2012. Figure 3 shows the movement of the expected risk premium for the next quarter from the survays of the CFOs in U.S.

It can be seen that the greatest expected risk premium is in February 2009 (amounting 4.78%), which is the period of the financial crisis. During the period covered with the analysis (2000Q3 – 2013Q1) there are two crises: March 2001 - September 2001 and the recent major world financial crisis December 2007 - June 2009. As it is depicted below in figure 7, the historical risk premium varies over time, and the financial theory relates the time varying nature of the ERP with the impact of the business cycle. In fact, the pure economic logic suggest that risk premiums should be greatest during the recession when risk aversion for investing in stocks increases, and decline during economic prosperity. The concept of the historical risk premium has shown the opposite, but the concept of the expected risk premium should reflect the simple economic logic. According to Graham and Harvey (2013) during the recession the market risk premium is 3.98%, and during the stable economic activity is 3.42%. In fact, for the entire analyzed period, the average premium is 3.53%, indicating that the expected risk premium is high in recession and non-recession period. In fact expected ERP is still a result of expectations for growth and in forming their expectations investors and CFOs influenced of the recent past, and also they are optimisticaly biased. From the figure 3 we can see also that in the period of recession the standard deviation of the risk premium rises which indicates that people have less confidence in their predictions. But although in the post recessive period expected ERP declines, the standard deviation remains high.

In this paper we will analyze the historical ERP. The decline of the historical equity risk premium always happen in economic disturbances due to the collapse of the stock market returns. Right this moment we want to show in this analusis.
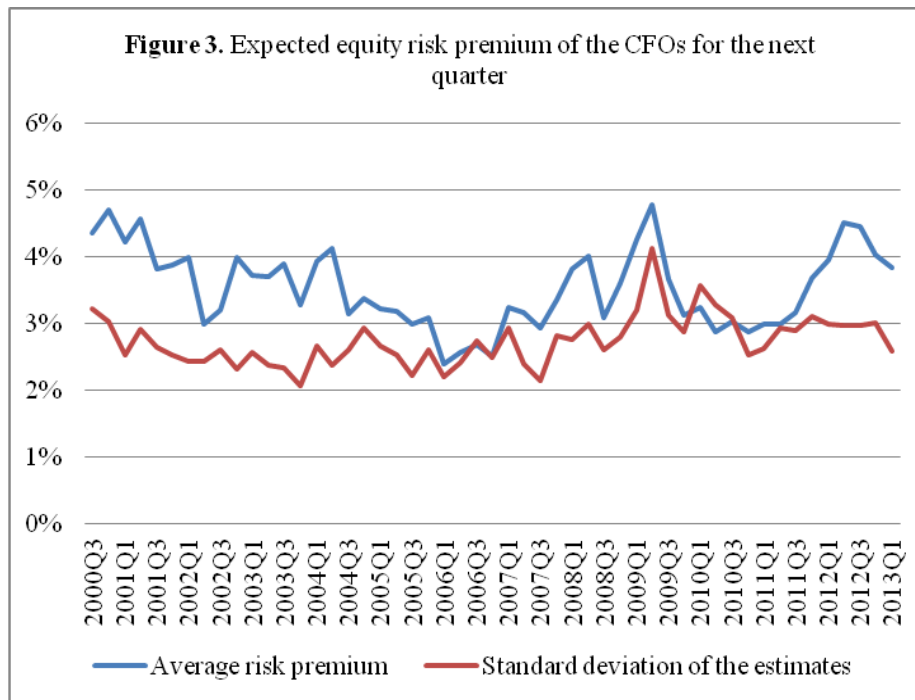
Source: based on data in Graham and Harvey (2013)

3. Data description and methodology

Regarding the data and their interpretation we highlight some of the standard problems associated with emerging markets. First, time series of the data for emerging markets is not available for such a long period of time as in the case of major developed markets. Moreover, in developing countries there is a significant volatility of the data. As a result, it is not possible to extrapolate strong conclusions based on long-term empirically validated relationships. Secondly, the quality and availability of the data in some cases contentious. Third, the change of regime through the past can complicate the interpretation of empirical results.

Market returns are calculated from Morgan Stanley Capital International, (MSCI) Total Return Indeces for the developed and emerging markets (MSCI G7 and MSCI Emerging markets respectively). The data for the risk free rate are from the database of the Federal Reserve Bank of St. Louis posted on their website. From the same data base we take the data for Federal funds Rate. Industrial production data are taken from the Organization for Economic Cooperation and Development, OECD. Time series of global MSCI world index starts from December 1969, for MSCI G7 starts from December 1976, amd for MSCI Emerging markets from December 1987.

The risk premium is defined as the annual realized stock market return minus the risk-free rate. More specifically, it is the annual return for the specific MSCI index minus the yield of the U.S. ten-year Treasury bond.

$$ERP_t = R_{t,t+1}^e \mid R_t^f \tag{1}$$

Here, ERP_t is the realized equity risk premium in time t, $R_{t,t+1}^e$ is the realized annual return of the stock market index, and R_t^f is the yield on the U.S. ten-year government bond.

Measurement of the risk premium in local currency would be the weakest form of a risk premium, which will not be of interest to international investors. Therefore, we calculate the returns of the stock markets in U.S. \$ for both developed and emerging markets, relative to the yield on ten-year U.S. government bond US \$ as a risk free rate. Given that the time series of MSCI Emerging markets are short starting in December 1987, in order to achieve a greater number of observations, we compute annual returns for each month of the year.

## 4. Empirical results

4.1. Descriptive statistics

In the analysis we considers the MSCI World as a representative for the global stock market, the MSCI G7 as a representative for developed markets and the MSCI Emerging markets as a representative of emerging markets. Market returns are calculated as the annual returns for each month from the common sub period. Namely, in order to provide a homogeneous analysis between countries, there has been a common sample time series covering the period from January 1989 to December 2012. Risk free rate is the yield to maturity on 10 years U.S. Treasury bond. Table 1 provides descriptive statistics of the time series.

Realized risk premium. From Table 1 it is obvious that the stock market return in the emerging countries is double of that in developed countries. Namely for the whole analyzed 24-year period the average annual rate of return in developed countries is only 7.85%, compared to 16.09% in emerging markets. Given that the average size of the risk free rate amounted to 5.31%, it is obvious that the emerging markets have reached 4.3 times higher equity risk premium of 10.78% VS the HEP in developed markets of only 2.49%.

The risk premium is not constant over time and furthermore it shows a downward trend. Figure 4 depicts the decrease in average risk premium. It is obvious that the average risk premium in the emerging markets in each time is higher than in developed markets, but follows the trend of dramatically reducing and convergence with the risk premium of developed markets.
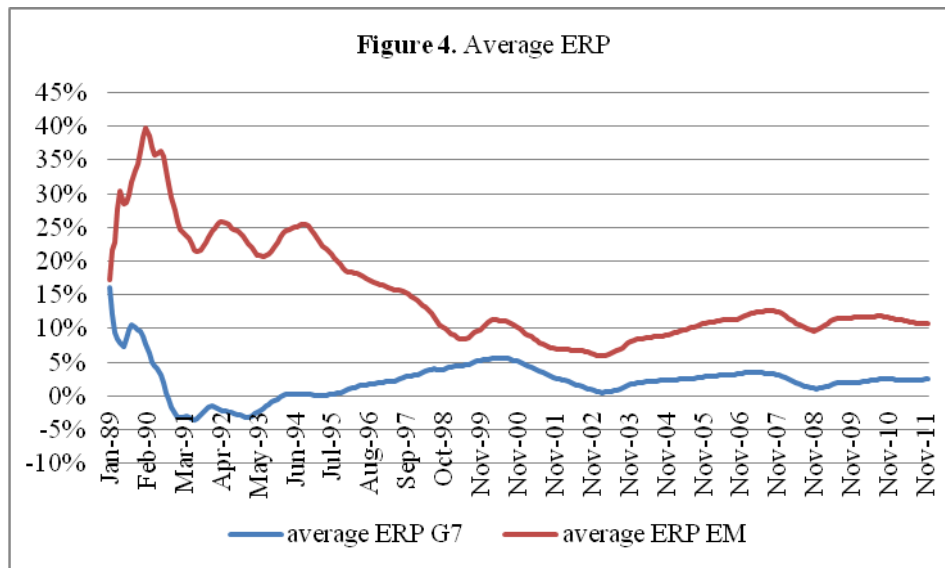
Source: Authors own calculations based on MSCI Indices

Distribution of the market risk premium. Here, we give an overview of the distributional characteristics of the time series of the historical risk premium, i.e. skewness and kurtosis. If the data are normally distributed, then these measures should be equal to 0 and 3 respectively. According to other authors in the literature, dominates the view that investors show decreasing absolute risk aversion and therefore, they have a preference for positive asymmetry. Common sub-sample data from 1989 to 2012 show the existence of a negative asymmetry and higher kurtosis in developed countries than the normal. The existence of negative asymmetry in developed countries is also confirmed by Bekaert, Erb, Harvey and Viskanta (1998), Salomons and Grootveld (2003) and others. Unlike developed countries, emerging markets mostly show positive asymmetry and kurtosis lower than the normal. As a result, the market risk premium seems to be not normal distributed. As noted by Haas (2007), empirical stock returns tend to be "leptokurtic", i.e. higher kurtosis and have fatter tails than the normal distribution. Following the Jarque and Bera (1980) and their test for assessment of the normality of the distribution, we test the null hypothesis that the risk premium is normally distributed. With significance level of 5%, at the level of sub-sample, we reject the null hypothesis for both developed and emerging markets. Figure 5 shows the distribution of risk premiums in developed and emerging markets. According to Scott and Horvath (1980) rational investors should prefer positive asymmetry. They argue that, a-priori, investors should prefer asset or portfolio with high probability of returns that are higher than expected, compared with the investment with high probability of returns that are lower than expected. Risk-averse investors prefer positive asymmetry than negative asymmetry. Thus, in the presence of negative asymmetry investors will require compensation for taking risk. Following this, and based on the results of descriptive statistics, we should expect that the market risk premium is higher in developed countries, but the results show the opposite, i.e. the market risk premium is higher in emerging markets.

Table 1. Descriptive statistics of the historical returns, historical ERP, 10 year US Treasury bond yield,

G7 change in industrial production and FED rate

	Annual return on MSCI World	Annual return on MSCI G7	Annual return on EM	ERP WORLD	ERP G7	ERP EM	USA 10Y BOND	G7 annual change in industrial production	FED rate
Mean	8.27%	7.81%	16.09%	2.95%	2.49%	10.78%	5.31%	1.26%	3.78%
Median	12.64%	12.10%	17.88%	6.72%	6.28%	12.78%	5.16%	2.03%	4.18%
Maximum	55.18%	52.29%	92.14%	51.49%	48.60%	88.45%	9.36%	10.29%	9.84%
Minimum	-46.76%	-45.52%	-56.43%	-49.63%	-48.39%	-60.03%	1.53%	-19.15%	0.07%
Std. Dev.	17.06%	16.79%	30.43%	16.93%	16.67%	30.11%	1.80%	4.45%	2.54%
Skewness	-0.748	-0.741	0.002	-0.616	-0.620	0.035	0.097	-2.273	0.131
Kurtosis	3.819	3.663	2.620	3.652	3.487	2.638	2.422	10.558	2.254
Jarque-Bera	34.9	31.6	1.7	23.3	21.3	1.6	4.5	933.5	7.5
Observations	288	288	288	288	288	288	288	288	288

Figure 5. Distribution of the annual market risk premium in developed and emerging markets in US $ for the period January 1989 to December 2012
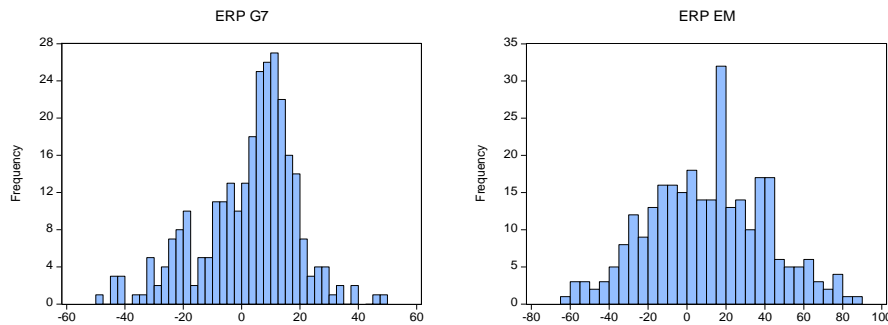
Risk. Standard deviation (σ) is generally accepted as the as a measure of risk in finance. According to this measure, it is easy to conclude that emerging markets are riskier than developed markets. The standard deviation of the annual ERP in the developed countries is 16.67% and is twice smaller than in the emerging markets of 30.11%. But at the same time the risk premium in the developed markets of 2.49% is 4.3 times lower than in emerging markets, which amounts 10.78%. It is obvious that the risk-return relationship is clearly expressed. Sharpe ratio for developed markets is 0.15, and in emerging markets 0.36. Given this we can conclude that although emerging markets are riskier they still provide investors better earnings.

Conventional theories of the last period generally say that emerging markets provide investors with the great opportunity for international diversification, which will not be the subject of this research, but also provides investors with greater compensation the risk i.e. higher returns. With a significance level of 5% we test the hypothesis of equality between the risk premium in the emerging markets with the risk premium in the developed markets:

$$H0: ERP_{developed} = ERP_{ememerging\ markets}$$
$$H1: ERP_{developed} \neq ERP_{ememerging\ markets}$$

With a confidence level of 95% and 99% we reject the null hypothesis, and confirm that the realized risk premium in emerging markets is higher than the risk premium in the developed markets. Table 2 provides the results of the test for equality.

Many authors relate the time varying nature and the volatility of the market risk premium with the global business cycles in both developed countries and emerging markets. In the later one it is especially related with increasing globalization and their integration with the world economy. Salomons and Grootveld (2003) who deal with this issue in more detail, emphasize the fact that emerging markets are heavily exposed to global business cycles and that investors can see emerging markets as a "leveraged play" in the global cycle (i.e. markets with high beta). This is evident in all countries without exception, developed and undeveloped, which indicates the impact of global business cycles on the risk premium. This also points the increasing integration of emerging

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markets into the world economy, which we will analyze in more detail through the coefficients of correlation between the returns of the indexes.

Table 2. Results of the test for equality of risk premiums in emerging markets and developed markets

	ERP G7	*ERP EM*
Mean	2,49%	10,78%
Known Variance	278,05	906,31
Observations	288	288
Hypothesized Mean Difference	0	
z	-4.087	
P(Z<=z) one-tail	2E-05	
z Critical one-tail	1.6449	
P(Z<=z) two-tail	4E-05	
z Critical two-tail	1.96	

As we have mentioned above, the financial markets in emerging markets are also influenced by the fall of the world economy. The fall of the advanced economies over the past five years, with the emergence of the global financial crisis of 2008, spilled over in the emerging markets causing decline of their economy. In the last decade, especially in recent years, countries have become more integrated in their financial markets, although located in completely different geographical areas. Table 3 clearly confirms the growing integration between emerging markets and developed markets. If the correlation coefficient for the period 1989 - 2012 was 0.621, in the recent periods it was increasing and in the last two years is even 0.933. These coefficients are even higher in relation with the return on the world stock market index, which is understandable.

Table 3. Correlation of the annual stock market returns of the emerging markets and developed markets

|	Period				
	1989-2012	1995-2912	2000-2012	2005-2012	2010-2012
EM annual returns VS World annual returns	0.658	0.704	0.903	0.905	0.940
EM annual returns VS G7 annual returns	0.621	0.675	0.888	0.884	0.933

4.2. Economic cycles and the market risk premium

The ultimate effect of the great financial crisis of 2007-2009 was a dramatic decline in the global economic activity that led to the 2008-2012 global recession and caused the European debt crisis.

Figure 6 clearly shows the decline in economic activity as measured by the index of industrial production of G7 countries. Namely, the emergence of the first signs of the crisis in August 2007 caused by a reduction in global liquidity, despite it was immediately reflected in the financial market, the impact on the real economy was imminent and occured with a delay of half to one year. The graph clearly shows that in 2008 there is a sharp drop in stock exchange indices in both developed and emerging markets followed by a deep decline in the real economy.

To test the hypothesis that the time-varying risk premium is caused by the global economic cycles, we examine the relationship between annual changes in industrial production and the annual historical risk premium, with observations on a monthly basis. Figure 7 depict the volatility, i.e. time varying nature of the annual market risk premium, both in developed and in emerging markets. Also it is obvious that industrial production show correlated movement with the risk premium, especially in the period of the financial crisisis of 2008. Correlation is more pronounced with the risk premium in developed countries than with the risk premium in emerging markets. Table 4 gives the correlation coefficients between annual changes in industrial production and the annual risk premium, with observations on a monthly basis. It is obvious that changes in industrial production to a greater extent are correlated with HEP in developed countries than in emerging markets.
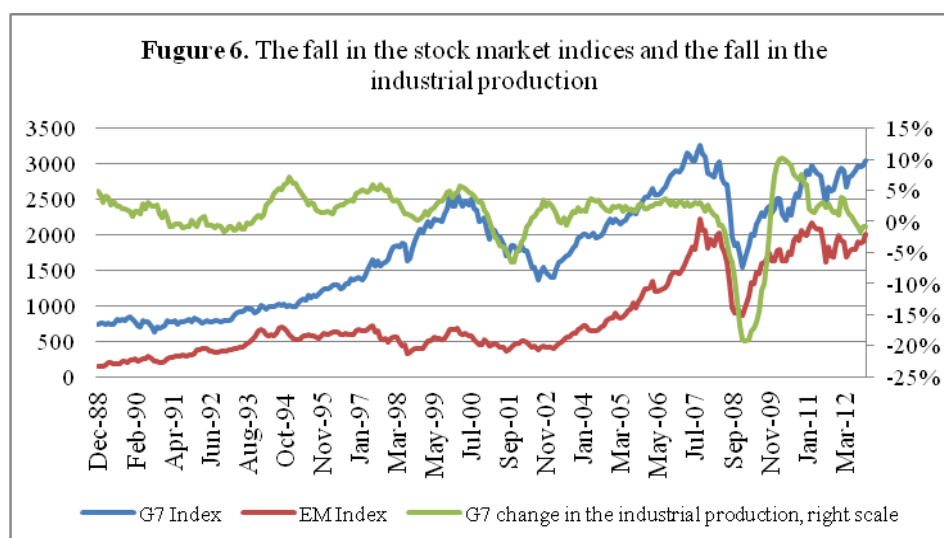
Fugure 6. The fall in the stock market indices and the fall in the industrial production

Source: OECD u MSCI

Table 4 Correlation between economic cycles and the risk premium

	ERP G7	ERP EM	G7 change in the industrial production
ERP G7	1		
ERP EM	0.610	1	
G7 change in the industrial production	0.401	0.345	1

Key events that affected the decline in industrial production, which is accompanied by a fall in the historical equity risk premium is most obvious in the early 1980s, early 2000s, and especially the period of the recent financial crisis of 2007-2009.

Narrow comovement between industrial production and the risk premium may lead us to apply the regression analysis.

We conduct classical regression analysis in order to see if industrial production explains HEP. However, this regression to some extent may seems economically illogical. First, the question is whether it can be opposite, i.e. can ERP be explanatory variable of industrial production. Second, the both variables were determined by the third variable, i.e. the global liquidity. Namely, it is the growth of global liquidity in the period before the crisis that has affected both variables to increase, and the loss of global liquidity had led both to decline. Anyway, the existence of a significant correlation between them, as shown in the able 4, confirms that the variation of the historical equity risk premium is determined by the economic cycles.

In order to see the relationship between the historical equity risk premium and industrial production, we conduct a simple classical straight-line regression. The results of the regression together with the t-statistics in parentheses are this:

In the case of developed markets:

$ERP_{G7} = 1,914 + 1,715\ G7_{IND}$ adjusted $R^2 = 15,9\%$
      (2,22)   (8,97)

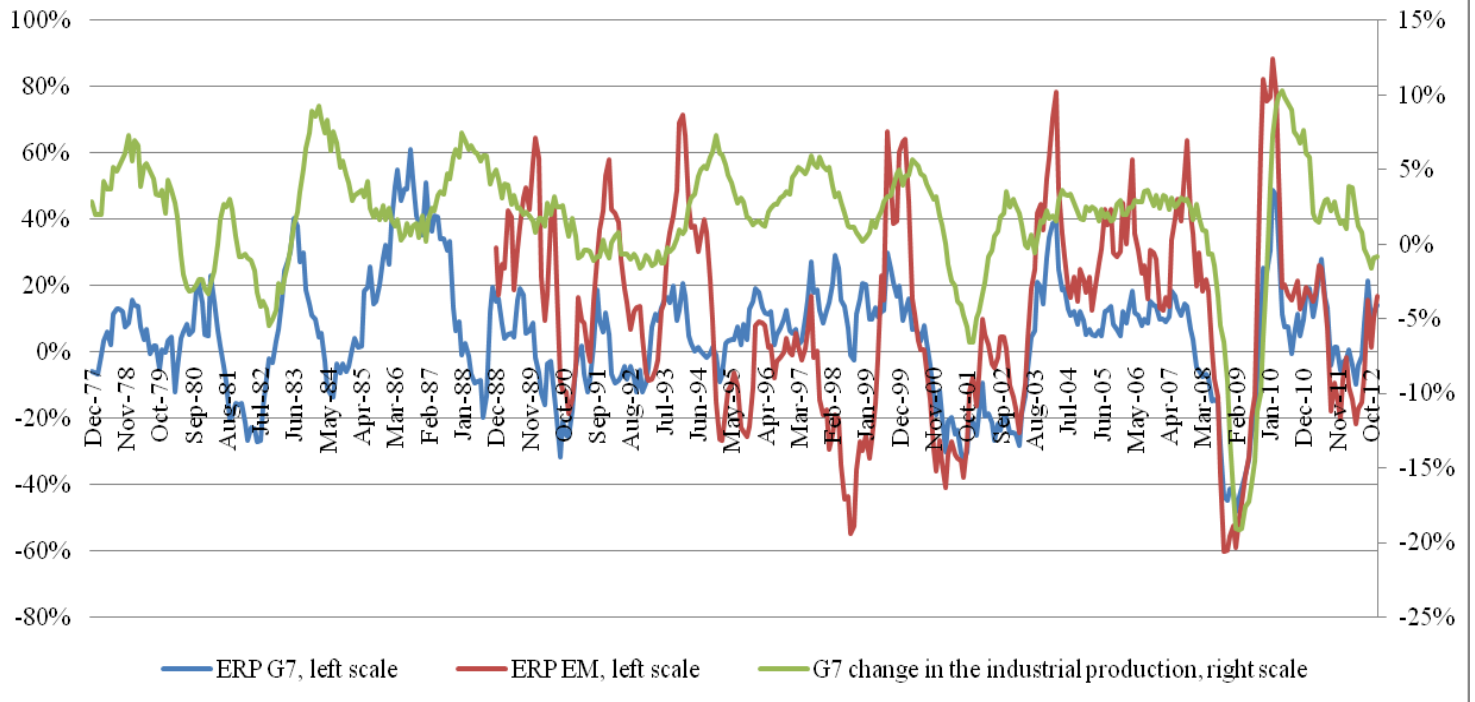In the case of emerging markets:

$ERP_{EM} = 7,882 + 2,329\ G7_{IND}$ adjusted $R^2 = 11,6\%$
      (4,55)   (6,22)

Figure 7. Economic cycles and the equity risk premium

ERP G7, left scale   ERP EM, left scale   G7 change in the industrial production, right scale

Since the economic crisis was a result of the reduction in global liquidity, we conduct clasical linear regression in order to see the relationship between the equity risk premium and the global liquidity. Baks and Kramer (1999) concluded that global liquidity (as measured by excess money supply growth in G7 countries) is in negative correlation with interest rates and is positively correlated with stock returns. IMF recently explored the relationship between the growth of global liquidity, asset prices and capital inflows into emerging markets[3].

The study concluded that the increase in the global liquidity is associated with increase in the stock returns and decrease in real interest rates in 34 economies. In addition, Alessi and Detken (2011) have investigated the extent to which financial and real indicators may be useful in predicting costly asset price boom and bust cycles using data from 1970 to 2007 for 18 OECD countries. They concluded that the global financial variables (especially M1 gap and credit gap) is more informative than the real variables in detecting these boom and bust cycles in asset prices. There are a number of measures that can be taken as a benchmark for a global liquidity, and the typical measure is the basic (short-term) interest rate of the central bank[4].

Damodaran (2012) also found that there is a positive relationship between Treasury bonds rate (the risk free rate) and the implicit risk premium. We found that the correlation coefficient between the HRP in the developed countries and the Fed rate is small but positive and amounts to 0.03. The correlation coefficient between the Fed rate and the HRP in emerging markets is also small but positive and amounts to 0.051. Therefore, we take the basic interest rate of the central bank of the United States that serves as an instrument of monetary regulation as a representative of global liquidity for both emerging markets and developed markets[5].

In the case of developed markets:

$$\text{ERP}_{G7} = 4{,}810 + 3{,}096 \text{ FED} \qquad \text{adjusted } R^2 = 0{,}8\%$$
$$\quad\quad (5{,}52) \quad (2{,}17)$$

In the case of emerging markets:

$$\text{ERP}_{EM} = 11{,}799 + 33{,}536 \text{ FED} \qquad \text{adjusted } R^2 = 4{,}43\%$$
$$\quad\quad (6{,}75) \quad (3{,}79)$$

Also, there is a close relationship between industrial production and world liquidity:

$$\text{G7}_{IND} = 1{,}935 + 1{,}321 \text{ FED} \qquad \text{adjusted } R^2 = 2{,}7\%$$
$$\quad\quad (9{,}46) \quad (3{,}87)$$

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[3] IMF, "Global Liquidity Expansion: Effects on 'Receiving' Economies and Policy Response Options", Global Financial Stability Report, April 2010

[4] European Central Bank, (ECB), Financial Stability Review, December 2011, p. 141.

[5] Bo (ECB), Financial Stability Review, December 2011, p.141 further states that there is a close correlation and high convergence in short-term interest rates in developed countries and emerging countries. Accordingly, we will use a benchmark interest rate to measure the impact of the global liquidity for both emerging markets and developed countries.

From the results of the regression analysis it can be concluded that although industrial production and global liquidity are statistically significant variables, according to the size of the coefficient of determination it can be concluded that this variables have small explanation power of the risk premium. Also, the industrial production is determined by the global liquidity, but this variable explains the production only by 2.7%.

5. Conclusion

Investing in stocks is a risky activity and accordingly investors in stocks require adequate compensation in the form of additional return to undertake investment. Investing in stocks is a risky activity in developed countries, and even riskier in emerging markets with young and underdeveloped capital markets and high volatility of stock returns. Our paper gaves an overview of the risk premium earned in developed versus emerging markets. We have shown that the average stocks market return is double in emerging markets, but also double volatile, i.e. more risky. Accordingly, at a given average risk-free rate, emerging markets enable investors to achieve 4.3 times higher compensation for the risk undertaken in the form of a risk premium, which in emerging markets accounted for 10.78%, while in developed markets amounts to 2.49%. Measured by the Sharpe ratio, we prove that investors in emerging stock markets achieved dramatically better risk-return relationship.

In this paper we have shown that the equity risk premium is not constant as assumed by classical financial paradigm. It varies over time with large amplitudes in the developed markets, and particularly in emerging markets. Given a relatively low volatility of the risk free rate, the movement of the risk premium in the past was caused by the movements in stock returns. Economic distortions followed by recession, as well as periods of economic boom, are causing significant movement on the stock markets and increased volatility. Economic crisis definitely have big impact on the increasing volatility in investment in shares. This ultimately leads to the change in the equity risk premium. We found a close relationship between the movement of the market risk premium and changes in the real economy measured by changes in industrial production. We found a remarkable and growing correlation between the emerging markets and developed markets equity markets and their convergence. Economic disturbances in developed markets are immediately reflected on the equity risk premium in emerging markets. Especially, recent financial crisis of 2007-2009 shows that the collapse of financial markets greatly affected the real economy, measured by the change in industrial production. In fact, this financial crisis started with disturbance of financial markets in the U.S., which immediately affected financial markets around the world, and then reflect on the real production with some delay. The main reason was the loss of global liquidity which began in August 2007. Therefore, as a reason for the collapse of the financial markets and the real production we take the global liquidity. However, in the literature there are divergent views regarding the impact of the global liquidity. We found a small but positive correlation between the equity risk premium with the global liquidity. The results of the regression analysis show that

global liquidity as a measured by the Fed rate is statistically significant variable in explaining the risk premium in both developed and emerging markets.

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