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Impact of the Macroeconomic Factors on the Initial Public Offerings in the Gulf Cooperation Countries

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Abstract. This paper seeks to address the question of whether local macroeconomic parameters (reference interest rate, crude oil production, stock market index, direct foreign investment, loan growth and GDP) have any influence on the numbers and volume of IPOs on an emerging markets of GCC region over the period of 1996 to 2016. The Gulf Cooperatin Council is a regional intergovernmental political and economic integration group of 6 Arabic countries (Kingdom of Bahrain, State of Kuwait, Sultanate of Oman, State of Qatar, Kindgom of Saudi Arabia and the United Arab Emirates). The region primary capital markets still seem to be rather poorly developed.

1. Introduction

All over the world companies go public to access capital markets and finance their futher development. This research points out key internal and external factors that have significant effect on the financing choice of enterprises via IPOs. Recent studies show the strong relationship between macroeconomic factors and IPO markets [Tran & Jeon (2011); Chen (2009), (2007); Jovanovic & Rousseau (2004); Campbell, Lettau, Malkiel, & Xu (2001)]. These studies argue that changes of macroeconomic factors affect cash flow of many companies and influence risk-adjusted discount rates.

The motivation of this study is to address the question if local macroeconomic variables have any influence on the number of IPOs and volume of raised capital in GCC region.

It could be assumed that the global IPO market reflects trends of the world economy and follows its cyclical development. The number of IPOs fluctuations can be explained due to the influence of macroeconomic factors on the cash flow as well as risk-adjusted discount rates [Ameer, R., (2012)].

Analysis of the impact of the IPO market cycle on the initial public offering process is based on the study of the relationship of key internal and external factors affecting the decision to hold an IPO. Loughran, T (1994) determined the relationship between the IPO timing (based on IPO data of 15 countries) and the key indicators such as stock market index adjusted for inflation and GDP growth rate. He found a positive relationship between the number of IPOs and the stock market price levels. However, he was unable to identify any positive correlation with the phases of the economic cycle. Rudkvist K. and Hogholm K. (1995) found that bursts of IPO activity generally occurred only after a sharp increase in share prices. Lungvist A. P. (1995) in his research suggests that a large number of IPOs has a positive correlation with both high level of equity indices and favorable conditions for business. Although they have a tendency to underestimate the issuing company. Breinlinger L. and Glogova E. (2002) have studied the impact of certain macroeconomic factors over IPO market factors

of six developed countries of continental Europe for the period over 18 years (1980-1997). They tried to clarify the connection between the number of IPOs and the performance of the stock market indexes. The research studies the influence of stock index returns on IPO volumes, necessity for problem segmentation was found. The hypothesis that percentage changes in savings and GDP growth have explanatory power for IPO volumes could not be supported by empirical evidence; neither the two factors exhibits any significant influence.

The result of the study of Ameer, R. (2012) established a negative relationship between the interest rates level and IPO volumes. The paper proved a positive correlation between industrial production and the number of IPOs in Malaysian emerging market. That study confirmed the impact of macroeconomic factors on the number of IPOs in the developing and developed capital markets.

As a result of studying dependence of the IPO market of Poland on the macroeconomic factors, Meluzin, T., Zincecker, M. Lapinska, J. (2014) found the relationship with the percentage year to year change of GDP and changes of WIG (Warszawski Indeks Giełdowy) of the Warsaw Stock Exchange. However, in their study, they analyzed only the dependence of the number of IPOs from the macroeconomic factors, not taking into account the amount of capital raised during the IPO.

The relationship between the number of IPOs and macroeconomic factors is a relatively not well-developed area of the IPO process study. The question of applicability of the research results to the modern global IPO market and the market of GCC region, in particular, remains open and requires verification. The majority of the studies refer to the impact of macroeconomic factors on the number of IPOs, not considering the impact on the amount of raised capital. The size of the IPO market is determined not only by the number of IPOs, but also by the amount of raised capital.

2. Literature review and hypothesis

In this study GCC IPO market cycle and it dependence on macroeconomic factors over the period from 2007 to 2016 raised the question of the existence of the interdependence between economic indicators, the number of placements and raised capital. Regression analysis of OLS (Ordinary Least Squares) models and test hypotheses made using specialized mathematical package GRETL (GNU Regression, Econometrics and Time-series Library, version 2015d). A gradual decline in the number of non-significant variables using stepwise elimination (a posteriori method) was carried out. Data was tested in significance level $\alpha = 5\%$ (95% confidence interval).

The study put forward several hypotheses to explain the impact of global economic indicators on the number of ongoing IPO and on the volume of capital employed in the framework of placements.

H1: There is a positive relationship between GDP growth and number of IPOs / raised capital

On the one hand, La Porta and his co-authors [La Porta et el (1997)] evaluated the effect of economic conditions: the legal system, the IPO number of 49 countries. The results of the study of Breinlinger, L. & Glogova, E. (2002) show a high correlation between an effective legal system with a per capita GDP – they have a significant positive impact on the IPO number. In other words, the average annual percentage increase of GDP per capita between 1970 and 1993 has a significant impact on the amount of IPO. On the other hand, Rydqvist, R. and Hogholm, K. (2007) and Loughran, T. et el (1994) showed that short-term growth rate of GNP does not have a significant impact on European market IPO activity. In addition, Breinlinger, L. & Glogova (2002) analyised IPO market of 6 European countries for 18 years, and the study did not confirm the hypothesis that GDP growth rates have an impact on the number of IPO. In fact, GDP reflects the well-being of the economy, which can directly affect the market sentiment. Thus, according to the hypothesis 1, with GDP growing activity on the IPO market will rise.

H2: There is a positive relationship between industrial production rate and number of IPOs / raised capital

The industrial production rate is an indicator of business cycles that affect the price fluctuations on the stock market [Moody, J. Et el (1993)], it reflects the structure of the economy [Holsey, A. Et el (1985)]. On the one hand, the growth of the industrial production rate reflects the development of existing industries, which can cause increase of the IPO number, and, on the other hand, may indicate

the development of high-tech industries, new and innovative companies, which come to the capital markets seeking for investments for development. In other words, some industries tend to cluster leading to formation of clusters or IPO waves [Choe, H. Et el (1993)]. As a result, these companies may take an abnormally large proportion of the total IPOs number.

The theory of business cycles suggests that the company is capable for IPO at a certain stage of development, when capital is needed for further development. High activity on IPO market can be due to abnormal activity on the market in certain industries. The most famous example is the dotcom crisis in the second half of the 1990s. To test the hypothesis in the study will use the percentage change of industrial production. For the GCC region we add the Crude oil production parameter – the hydrocarbon industry has a significant share in the region's economy.

Thus, according to H2, with an increase in the industrial production rate (crude oil production) activity in the IPO market will be increased.

H3: There is a positive relationship between stock exchange index and number of IPOs / raised capital

The studies of stock exchange index show that they all detect a significant positive influence of stock index returns (Loughran et al., (1994); Ljungqvist, (1995); and Rees, (1997)) on the number of IPOs.

Stock exchange index is the main indicator of the stock market, composed on securities group reflecting the price dynamics on the market. Stock markets around the world are connected via communication channels, and the information can be distributed among the investors very quickly. Stock exchange index changes over time and gives an indication of the general direction of price movement. The pessimistic mood in the market causes a decrease in quotations and contributes low volume of trade on the stock market and lower incomes [Tetlock, P. (2007)]. Pessimism and optimism equally affect stock market in accordance with market timing theory - stock market index reflects investors' intention to invest and that directly affects the amount of IPO. Companies are more favorable to hold an IPO at a time when the market promises higher returns for the company and for potential investors. Loughran, T. (1994), Ljungqvist, A. (1995), Rees, W. (1997) as well as Rydqvist, K. and Hogholm, K. (1995) identified a positive impact of stock index changes on the number of IPOs. Global stock market index generally consists of large companies: MSCI World and S&P Global 100. The absolute value of the index in the context does not carry any interest for that sudy.

Thus, according to the H3, with an increase in value of the stock index the IPO market will rise.

H4: There is a positive relationship between volume of private equtiy investment and number of IPOs / raised capital

Public market is a step to gain access to an important channel of obtaining venture capital. The stock market may be a factor contributing to the acceptance of the decision to hold the IPO. Cumming, J. and Johan, S. (2012) studied Canada, USA, UK, France, Israel, India and Germany IPO markets, as a percentage of global indicators for the period 1990-2010.

For the GCC IPO market we also checked the foreign direct investment. With the opening of local stock markets to foreign investors, IPOs provide access to foreign investors to local stock markets to achieve portfolio diversification. Kaminsky, Lyons and Schmukler (2001) report that mutual fund investments in the form of net private equity flows to East Asian emerging markets have been a major source of development for capital markets. According to the capital demands hypothesis (Lowry, 2003), when companies have higher demands for external capital, managers think of lower costs for raising capital by sharing the risks with foreign investors.

Thus, the growth of private equity investment (foreign direct investment) will be the signal for the IPO market growth.

H5: There is a positive relationship between LIBOR and number of IPOs / raised capital

The rate of LIBOR (London Interbank Offered Rate) - is the average interest rate of interbank loans estimated by leading banks in London. The higher the LIBOR rate, the higher the cost of debt capital. When choosing a method of attracting external financing company evaluates all the possible advantages and disadvantages. With the high cost of an IPO of credit may become more profitable.

Thus, according to Hypothesis 5, with an increase of the LIBOR rate the IPO market will increase activity. For GCC we also added the loan growth in the region.

H6: There is a negative relationship between yield on 10-year bonds and number of IPOs / raised capital

Rees, W. (1997) analyzed the relationship between the IPOs number and refinance interest rate by UK companies data, and come to the conclusion that there is no relationship or it is very insignificant. On the other hand, Ameer R. (2012) proved by the example of Malaysia that monetary policy has a direct impact on the capital markets, and that the intervention of the central bank distributes IPO cycles. Basing on Jovanovic, B. and Rousseau, P. (2004) research, Ameer suggested a negative relationship between the refinancing interest rate and the number of IPO - high level of interest rate is not suitable for an IPO. The study uses the yield on 10-year Treasury bonds, which are primarily indicators of the cost of long-term capital. Often comparing bond yields and earnings per share is used for the evaluation of investment attractiveness: the difference having a positive value indicates the investment attractiveness. For GCC we also added the reference interest rate in the region.

3. Data and methodology

The data consists of all Global IPOs during the period from 1996 to 2015 and for GCC IPO market from 2007 to 2016. Table 1. contains summary information about the variables used and their sources, periods and the expected dependence. To carry out the analysis we propose to use the performance of the world economy. Positive interdependence is indicated by a "+", and the negative sign "-".

Table 1. Analyzed Variables.

Hypothesis		Region	Variable		Data Sources	Calculation
			Depended variable			
		Anual Number of IPOs		NIPO	PWC, E&Y, Deloite, KPMG, Reports	using yearly closing dates
		Volume of raised capital		IPO*vol*		$ bln, using yearly closing dates
			Independed variable			
+	H1	World	GDP Growth rate	GDP*gr*	IMF	anual growth rates in %
		GCC				(using yearly closing dates)
-	H5	World	LIBOR	LIBOR	British Banker's Association	% (using yearly closing
		GCC	Reference Interest Rate	RIR	Central Bank	
-	H6	World	Yield on 10-year bonds	Bond10	Fed Reserve	% (using yearly closing
		GCC	Loan growth	L*gr*	Central Bank	
+	H2	World	Industrial Production Growth Rate	IP*gr*	Fed Reserve	anual growth rates in %
						(using yearly closing dates)
		GCC	Crude Oil Growth	CO*gr*	Ministry of Oil and Gas	
+	H3	World	Stock Exchange Index	SEI	MSCI Inc., Kuwait Stock Exchange (KSE), Bahrain Stock Exchange (BSE), Qatar Stock Exchange (QSE), Muscut Securities Market (MSM), Dubai Financial Market (DFM), Tadawul	anual growth rates in %
		GCC				(using yearly closing dates)
+	H4	World	Private Equity Investment	INV*gr*	Fed Reserve	anual growth rates in %
		GCC	Foreign Direct Investment	FDI*gr*	Central Banks	(using yearly closing dates)

Source: own processing

In this research two models were used to estimate the parameters of the linear regression model for the world IPO market and two models for GCC IPO market described by equasions:

$$NIPO_t = \alpha_0 + \alpha_1 GDPGr_t + \alpha_2 IPGR_t + \alpha_3 SEI_t + \alpha_4 INVGR_t + \alpha_5 LIBOR_t + \alpha_6 Bond10_t + \beta_t \quad (1)$$

$$IPOvol_t = \alpha_0 + \alpha_1 GDPGr_t + \alpha_2 IPGR_t + \alpha_3 SEI_t + \alpha_4 INVGR_t + \alpha_5 LIBOR_t + \alpha_6 Bond10_t + \beta_t \quad (2)$$

$$NIPO_t = \alpha_0 + \alpha_1 GDPGr_t + \alpha_2 COGR_t + \alpha_3 SEI_t + \alpha_4 FDIGR_t + \alpha_5 RIR_t + \alpha_6 LGR_t + \beta_t \quad (3)$$

$$IPOvol_t = \alpha_0 + \alpha_1 GDPGr_t + \alpha_2 COGR_t + \alpha_3 SEI_t + \alpha_4 FDIGR_t + \alpha_5 RIR_t + \alpha_6 LGR_t + \beta_t \quad (4)$$

4. Results

All variables were analyzed and checked for a normal distribution. Shown only the obtained results if all data are included into the statistical processing.

Model 1.

Insignificant variables were gradually excluded from the model: private equity investment growth (P-value 0.94 INVGR), then the growth of the industrial production rate (IPGR; p-value 0.85), and at the last stage - global stock index (NGDPGR; p -value 0.81). Thus, we identified three variables with the greatest impact on the number of IPOs on the global market: GDPGR, LIBOR and Bond10.

Table 2. Model 1: OLS global IPO market; 1996-2016 (T=21). Depended variable: NIPO.

	Coefficient	*Std. Error*	*t-Statistic*	*P-Value*	
Const	1022,64	16786,4	0,0609	0,9522	
LIBOR	56,2814	28,1291	2,0008	0,0627	>10%
Bond10	−202,516	110,71	−1,8293	0,0861	>10%
GDPGR	146,362	47,985	3,0502	0,0076	>1%

Mean depended var	1256,550	S.D. dependent var	423,1992
Sum squared resid	679060,0	S.E. of regression	206,0127
R-squared	0,800444	Adjusted R-squared	0,763027
F(3, 16)	21,39265	P-value (F)	7,61e-06
Log- likelihood	−132,7061	Akaike info criterion	273,4122
Schwarz criter	277,3951	Hannan-Quinn criter.	274,1897
rho	−0,085002	Durbin-Watson stat.	1,969867

The model is statistically correct. Basing on the F-statistics the estimated model contains variables that have a significant impact on the co-dependent variable. Three of the six variables were significant (H1; H5; H6). The total efficiency of the model – effective. (R-squared = 0.76). Growth of real GDP (GDPGR, %) has a strong positive effect on the number of IPO on the global market. The parameter α (coefficient) is the largest of all the variables - 146.36. This means that the average 1% GDP increase leads to a proportional increase in number of IPOs approximately in 146 units. It should be noted that significant difference was found between the number of IPOs and GDP growth rates at the 1% level of significance, thus the H1 is supported. The yield on 10-year bonds has an impact on the dependent variable - the result parameter α (coefficient) of the variable has a value of -202. Bond10 demonstrates a strong negative effect on the number of IPO (α > 10%). LIBOR rate also has a significant impact on the number of IPOs (the effect is statistically significant) - with growth rates of Libor by 1% the number of IPOs in the world increased by 56 units. (A (ratio) = 56; α > 10%). Thus, according to Model 1, the hypothesis of influence of industrial production index growth (H2), stock index growth (H3) on the IPO global market data are not supported.

Model 2.

Analyzing the impact of macroeconomic factors on volume of raised capital on the global IPO market were excluded the least influencing variables: private equity investment growth (INVGR; p-value 0.88), yield on 10-year bonds (Bond10; p-value 0.66), change of LIBOR (LIBOR; p-value 0.30), and stock exchange index (SEI; p-value 0.38).

GDP growth (GDPGR) shows positive impact on the raised capital amount - H1 is confirmed, H2,3,4,5,6 - rejected. In other words, the amount of attracted investments during IPO grows when GDP increases (with GDP growth of 1% the amount of borrowed capital is to increase by 25 units.).

Model 3.

Thus, four variables defined have the greatest impact on the number of initial public offerings at GCC region. The model is statistically correct. Thus, the reference interest rate (RIR), crude oil production (COGR), growth of direct foreign investment (FDIGR) have the strongest positive impact

on the number of IPO in the region and negative impact – GCC GDP growth to the previous year. All variables have impact at the very high level of significance (5% and 1%).

Table 3. Model 2: OLS global IPO market 1996-2016 (T=21). Depended variable: IPOVol.

	Coefficient	*Std. Error*	*t-Statistic*	*P-Value*	
const	−2714,99	949,872	−2,8583	0,0109	
GDPGR	25,5916	9,39156	2,7250	0,0144	>5%
IPGR	2,24837	1,67958	1,3386	0,1983	

Mean depended var	156,5750	S.D. dependent var	64,67149
Sum squared resid	47269,43	S.E. of regression	52,73096
R-squared	0,405159	Adjusted R-squared	0,335178
F(3, 16)	5,789530	P-value (F)	0,012089
Log- likelihood	−106,0576	Akaike info criterion	218,1153
Schwarz criter	221,1025	Hannan-Quinn criter.	218,6984
rho	0,393774	Durbin-Watson stat.	1,204344

Table 4. Model 3: WOLS GCC IPO market 2007-2016 (T=60). Depended variable: NIPO.

	Coefficient	*Std. Error*	*t-Statistic*	*P-Value*	
RIR	35,7302	16,5558	2,1582	0,0352	**
COgr	0,0016229	0,000312839	5,1876	<0,0001	***
FDIgr	8,74298e-05	3,47351e-05	2,5170	0,0147	**
GDPgr	−0,0152993	0,00487187	−3,1403	0,0027	***

Mean depended var	2,250000	S. D. dependednt var	4,184819
Sum squared resid	506,6723	S.E. of regression	3,007943
R-squared	0,621038	Adjusted R-squared	0,600736
F(4, 56)	22,94301	P-value (F)	2,92e-11
Log-likelihood	−149,1419	Akaike criterion	306,2838
Schwarz criterion	314,6612	Hannan-Quinn criter.	309,5607
rho	0,328271	Durbin-Watson stat.	0,769087

The findings also imply that there is no statistically significant relationships between other macroeconomic indicators and the number of IPOs. The hypothesis that the srock exchange index (H3) and the loan growth (H6) don't have explanatory power supported by empirical evidence.

Model 4.

Using the Spearman correlation analysis a significant difference was found to exist between the IPO volume and crude oil production growth rates at the 1% level of significance and positive reltionships with direct foreign investment growth rates at the 5% level of significance. Thus H2 and H4 are supported.

Table 5. Model 4: WOLS GCC IPO market 2007-2016 (T=60). Depended variable: IPOVol.

	Coefficient	*Std. Error*	*t-Statistic*	*P-Value*	
COgr	0, 447407	0,158668	2,8198	0,0066	***
FDIgr	0,0421192	0,017546	2,4005	0,0197	**
GDPgr	-3,31881	2,37995	-1,3945	0,1686	

Mean depended var	730,8000	S. D. dependednt var	1814,214
Sum squared resid	1,33e+08	S.E. of regression	1529,874
R-squared	0.410306	Adjusted R-squared	0,389615
F(3, 57)	13,22012	P-value (F)	1,16e-06
Log-likelihood	−523,5740	Akaike criterion	1053,148
Schwarz criterion	1059,431	Hannan-Quinn criter.	1055,606
rho	0,033874	Durbin-Watson stat.	1,716266

The findings also imply that there exist no statistically significant relationships between other macroeconomic indicators and the volume of raised capital in GCC region. The hypothesis that the

refernce interest rate (H5), the stock exchange index (H3) and the loan growth (H6) don't have explanatory power supported by empirical evidence.

The study showed that the GCC IPO market activity is determined by macroeconomic indicators – crude oil production rate, direct foreign investments and GDP growth rate. It is worth to mention that H1 was disproved for the GCC region – the indicator has negative influence on the IPO market. That finding requires further research.

5. Conclusions

The study found that the greatest impact on the global IPO market has a change in the real world GDP. The world economy cycle reflects changes in global GDP and IPO market cycles (Figure 1). In fact IPO market activity is characterized by the number of IPOs and amount of raised capital.

The observed IPO market is characterized by periods of "hot" (high profitability and IPO volumes, positive market sentiment) and "cold" markets that form the IPO wave or clusters. The global IPO market can be described by 5th hot markets: 1998-99 years; 2003-07; 2009-10; 2013-14, and 5 cold - 1996-98 years; 2000-03; 2007-09; 2010-12.

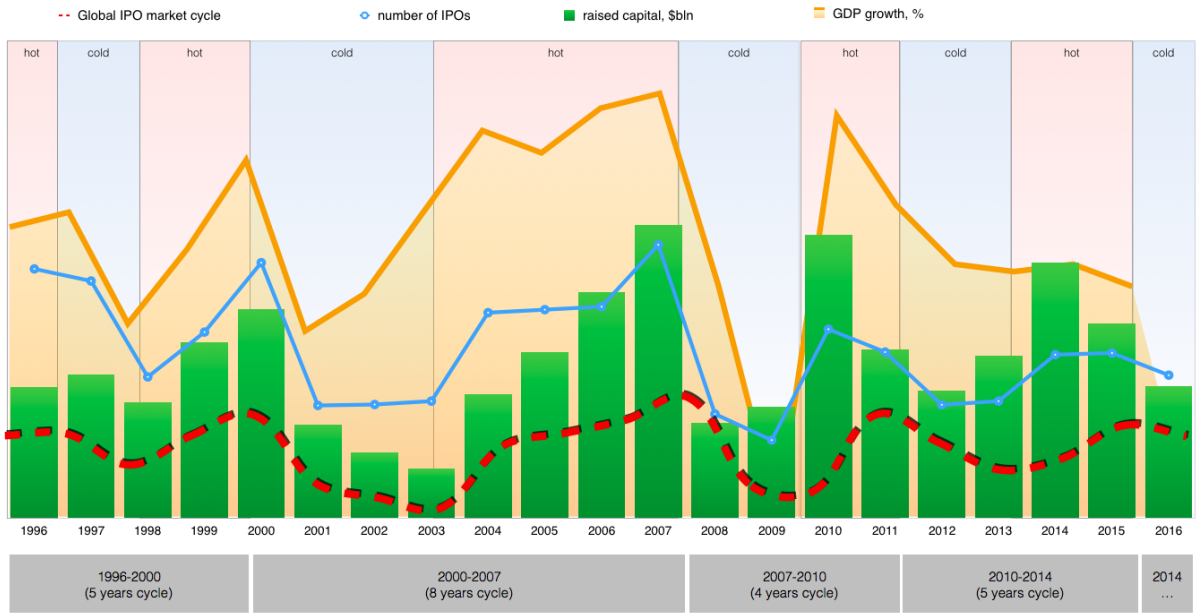

Figure 1. Global IPO market cycle.

Thus, over 21 years of global IPO market there were recorded four complete cycles: 1996-2000 (5 years cycle); 2000-2007 (8 years cycle); 2007-2010. (4 years cycle); 2010-2014 (5 years cycle). Global economic and geopolitical events had great influence on the global IPO market, such as the Asian crisis (1998), the boom of "dotcom" (2000), then the crisis of Internet companies (2001-03), the market boom in 2007, the global financial crisis (2008-09), the Eurozone crisis (2012).

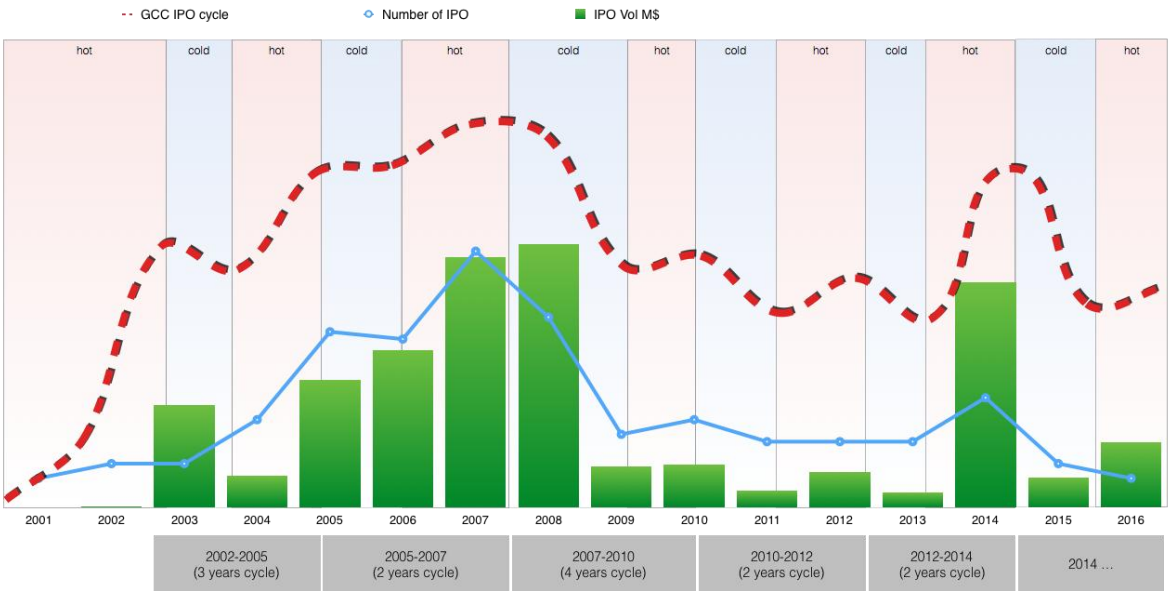

Figure 2. GCC IPO market cycle.

Figure 2 shows GCC IPO market cycle has close dynamics to the global market development. There are five complete cycles: 2002-05 (3 years cycle), 2005-07 (2 years cycle), 2007-10 (4 years cycle), 2010-12 (2 years cycle), 2012-14 (2 years cycle). Starting from 2014 the GCC IPO market is going in an incomplete cycle that is in phase of hot IPO market.

To compare the IPO market cycle of different regions it is important to choose a single reference point. For this reason, pre-crisis 2007 year was chosen as characterized by the maximum values of IPO activity at all region markets. Figure 3 shows the differences in the dynamics, amplitude, periodicity and phases of global and regional IPO markets cycle.

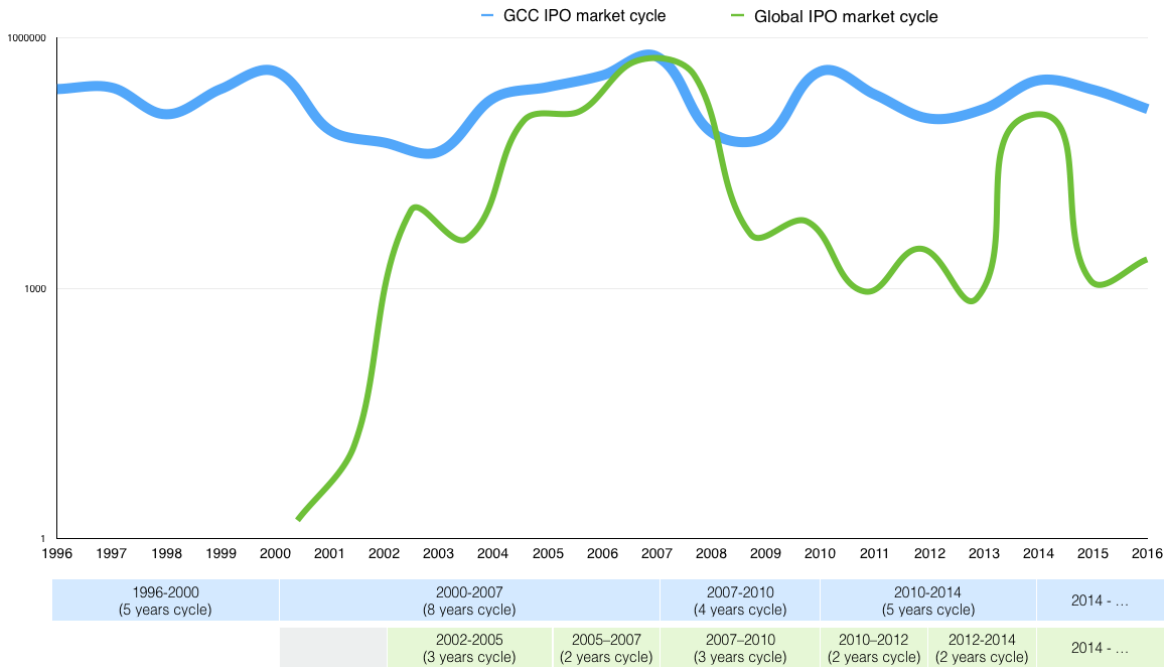

Figure 3. Global IPO market cycle (1996-16) and GCC IPO market cycle (2001-16).

Global and regional IPO markets were analyzed in the period between 1996 and 2016. It should be noted that the periods and phases of the cycles of all IPOs show correlation: the cycles of the global IPO market are 4-8 years; GCC region - 2-3 years. The cycles of the GCC IPO market differ from global due to the fact that smaller markets respond more sharply to changes in activity, even one placement can have a significant impact on the cycle phase change.

However, the amplitude is the maximum difference between the largest and lowest value of the indicator - the cycles of the global IPO market are much less than those of regional and it is less affected by fluctuations. This happens due to the fact that regional and national markets are affected not only by global events, but also by regional and national ones.

The global IPO consits of a number of national markets, so the most developed and active markets create global trends. The world market is recovering much faster after the shocks, but it is affected by a much larger number of factors. On the other hand, global events and trends have a great impact on the regional and national IPO markets. In addition, the GCC market has an irregular nature of development, which makes it difficult to identify the cycle - its actual development begins only in 2002 - with regular placement practices.

6. Acknowledgments

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