



Macroeconomic Determinants of IPO Activity in Poland between 1993 and 2013

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Abstract

Purpose of the article: This study deals with recent primary stock market developments in Poland and aims to indicate the influence of local macroeconomic indicators on IPO numbers over the period of 1993 to 2012.

Methodology/methods: Descriptive statistics are used to analyse capital market and IPO developments and the Spearman correlation analysis identifies the relations between macroeconomic determinants and the IPO numbers. The data were evaluated at the significance level of $\alpha=5\%$. The entire statistical evaluation was performed by Statistica.CZ, Version 12.

Scientific aim: The scientific aim of this article is to explore external factors that may influence the decision of enterprises to go public in the Polish capital market and thus to enlarge the current IPO literature with an analysis the following issue: What are the key local macroeconomic determinants of going public on the market in question? The number of variables used in this paper is greater than those considered in previous Polish IPO studies. Moreover, we focus on IPO activities between 1993 and 2012 and thus extend the existing time-series.

Findings: The results of the correlation analysis can be summarized as follows. First of all, the hypothesis that the business cycle and stock index returns have explanatory power for the number of IPOs could not be supported by empirical evidence. On the other hand, we found empirical support that the reference interest rate affected the IPO numbers.

Conclusions: The hypothesis that the reference interest rate has explanatory power for IPO numbers in the Polish capital market could be supported by empirical evidence. On the other hand we could not confirm any significant lagged effects concerning the relationship between other explanatory variables and the dependent variable. Therefore, our results suggest only a partial consistency with the theory and findings of previous Polish IPO studies.

Keywords: Corporate Finance, Capital Markets, IPO, Czech Republic, Poland

JEL Classification: E44, G23, G32

Introduction

Relations between the number of IPOs and the macroeconomic factors (*i.e.* external conditions) have been investigated in a relatively limited number of studies. Loughran *et al.* (1994) investigate the timing of IPOs in fifteen countries in relation to inflation-adjusted stock price indexes and GDP growth rates. The results suggest a positive relationship between the number of IPOs and stock price levels, however no positive correlation with the cycle movements. Rydqvist, Högholm (1995) compare the data for a sample of family-owned enterprises in Sweden (1970–1991) and eleven European countries (1980–1989). They find that “most going public activity took place after an exceptionally sharp stock price increase, and that going public activity is not related to the business cycle”. Ljungqvist (1995) suggests that high number of IPOs is positively correlated with both high stock index levels and good business conditions and tends to follow phases of extensive IPO underpricing. Breinlinger, Glogova (2002) investigate the explanatory power of selected macroeconomic factors influencing IPOs by analysing a data set of annual IPO volumes for six developed continental European countries over a time period of 18 years. The authors followed the question if there are stable indications that IPOs depend on stock index returns for what they termed consolidated periods. The results show that a “logarithmic transformation of IPO volumes (representing authors’ supposition of a nonlinear relationship between IPO volumes and stock index returns) leads to persistently significant estimates for both pooled and individual country regressions”. The hypothesis that percentage changes in savings, GDP growth and interest rates have explanatory power for IPO volumes could not be supported by empirical evidence.

A paper by Ameer (2012) shows a significant negative relationship between the interest rate and the number of IPOs and a significant positive relationship between the industrial production and the number of IPOs in the emerging market of Malaysia. Bilson *et al.* (2002) find a moderate evidence to support the connection between local macroeconomic factors and stock returns in emerging markets.

Microeconomic studies deal first of all with the motivation of going public. The main factors taking influence on decision to go public in a firm are divided in both academic and professional literature into four groups.

Authors in the first group point out the situation of a firm which needs to obtain external funds to undertake external net present value projects. The

primary securities market offers an opportunity to raise capital from a large number of previously unknown investors. As a result, more capital is accumulated than a single investor, or a limited number of investors, would be able or willing to provide. Raising funds through an IPO should be an alternative to borrowing, particularly in companies with high investments (now or in the foreseeable future), high proportion of debt in the capital structure, and high potential for growth (Chemmanur, Fulghieri, 1999; Ritter and Welch, 2002). Pagano *et al.* (1998) investigated a comprehensive data set of Italian companies. They conclude that U.S. companies usually undergo a considerable growth process after listing while the decision of Italian independent companies can be interpreted as “an attempt to rebalance their balance sheet after large investments and growth. Brau, Fawcett (2006) investigated 336 nonfinancial U.S. companies that had successfully completed an IPO or attempted and subsequently withdrew an IPO. More than a half of the interviewed CFOs strongly supported the notion that “an IPO serves to create public shares for use in future acquisitions”.

Pagano *et al.* (1998) followed by Black, Gilson (1998) connect IPOs with another reason. Public trading of shares provides a great advantage to both the issuers, to whom the shares issued provide a long-term source of financing, and to the investors, who can sell the shares purchased at any time on secondary markets and thus recover the desired liquidity, *i.e.* the money they invested. The short-term financial funds of individual investors are thereby transformed into long-term sources, which then make it possible to implement large-scale investment projects. Raising the stock capital through a public issue also eliminates the difference between the large shareholders, who tend to take a long-term approach to investing, and the small ones, who value liquidity and are therefore inclined to take a short-term view of their investment.

Zingales (1995) and Black, Gilson (1998) argue that going public is the way how the majority shareholder’s desire to reduce his stake in the company. Thereby, an IPO allows venture capitalists to cash out and resolves the problem of generational succession in a family-run enterprise. From the shareholder’s perspective, the option to cash out his co-ownership by selling the shares of stock at any time on the secondary market is an advantage that imparts a great deal of flexibility to his financial decisions. On the other hand, Brau, Fawcett (2006) findings do not support the public statement of many venture capitalists that an IPO is an integral part of their harvest strategy because “firms with VC presence

rank four motivations higher than the opportunity to allow VCs to cash-out”.

The last reason for going public is to gain a non-financial advantage from IPO implementation (Maksimovic, Pichler, 2001). Going public is therefore associated with positive effects in the area of marketing. First of all, an IPO can increase the publicity or reputation of the firm. The prestige can be very advantageous in recruiting key employees as well as marketing products and services. Brau, Fawcett (2006) point out that the motivation for going public in the form of firm reputation enhancing and analysts' attention attracting is significant for “smaller, younger, high-tech, and VC-backed firms”.

The motivation of this study is to make a contribution to the academic literature by addressing the question if local macroeconomic factors have any influence on the number of IPOs in Poland. The range of variables and the time period covered in this paper differ from those considered in previous Polish IPO studies (Brzeszczyński, 2014; Jargot, 2006; Meluzin, Zinecker, Łapińska, 2014a; Meluzin, Zinecker, Łapińska, 2014b).

This study is organized as follows. The second part represents the problem formulation and deals with research design, *i.e.* data and methodology. The third part presents the empirical research results. The last section summarizes and provides concluding remarks.

1. Research design and methodology

This paper addresses the issue whether local macroeconomic factors have any influence on the number of IPOs in the Polish capital market over the period of 1993 to 2012. The nature of this study is based on the theory and previous empirical research. All macroeconomic indicators analyzed in this paper have sufficient support in the finance academic studies (Ameer, 2012; Breininger, Glogova, 2002; Brzeszczyński, 2014; La Porta *et al.*, 1997).

For purposes of this paper the following hypotheses have been outlined:

Hypothesis 1: *There is a positive relationship between GDP growth rates and the number of IPOs.*

La Porta *et al.* (1997) assess the influence of economic conditions (namely the legal system) on the number of IPOs using a sample of 49 countries. As reported by Breininger, Glogova (2002) the La Portas *et al.* (1997) research results show that “the quality of law enforcement, which is highly correlated with the level of GDP per capita, has a strong

positive effect on the number of IPOs”. The authors identify a statistically significant relationship between long-term GDP growth rates, *i.e.* average annual percentage growth of per capita GDP for the period 1970 to 1993, on the number IPOs. On the other hand, the studies conducted by Rydqvist, Högholm (1995) and Loughran *et al.* (1994) show that the GNP short-term growth rates are no significant explanatory power for IPO activity across the sample of European countries. Also Breininger, Glogova's analysis (2002) of annual IPO volumes for six continental European countries over a time period of 18 years could not support the hypothesis that GDP growth rates have explanatory power for IPO volumes.

Hypothesis 2: *There is a negative relationship between the reference interest rate and the number of IPOs.*

Rees (1997), concentrating on UK data, found no significant link between the number of IPOs and interest rates. Research results by Breininger, Glogova (2002) also indicate that there is no perceptibly influence of interest rates (ten-year government bond yields) on demand for raising equity through IPOs. On the contrary, the study published by Ameer (2012) reports the opposite. Ameer's results (2012) imply that “monetary policy has a direct impact on capital markets and that central bank intervention propagates IPO cycles in Malaysia”. Based on a paper by Jovanovic, Rousseau (2004) Ameer (2012) supposed a negative relationship between interest rate and the number of IPOs.

Hypothesis 3: *There is a positive relationship between industrial production growth rates and the number of IPOs.*

The industrial production index as a measurement of the output of an economy also helps to map structural economy development (Hosley *et al.*, 1985). Besides, authors say that enterprises enter capital markets when other enterprises enter them too, meaning potentially higher overall industrial production (Choe *et al.* 1993; Lowry and Schwert, 2002).

Hypothesis 4: *There is a positive relationship between the stock market index returns and the number of IPOs.*

Stock markets around the world are interconnected through the communication channels and information can spread very quickly among investors. Pessimism on stock markets predicts downward pressure on market prices and on the other hand optimism or low amount of pessimism predicts higher stock market trading volume and higher returns (Tetlock, 2007). The pessimism and optimism which affects

Table 1. Source Data.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
% Real GDP Growth Rates (X1)	3.70	5.30	7.00	6.20	7.10	5.00	4.50	4.30	1.20	1.40
% Industrial Production Growth Rate (X2)	4.80	13.10	10.80	9.40	11.30	4.70	4.80	6.80	0.40	1.40
% Ten-Year Government Bond Yields (X3)	45.10	42.00	33.50	26.10	25.20	24.50	16.90	20.00	18.40	12.00
% Change in Stock Market Index (WIG) Returns (X4)	1059.30	-39.90	1.50	89.10	2.30	-51.10	41.30	-1.30	-21.00	3.20
Number of Listings/IPOs (Y)	1	3	3	6	6	19	16	8	7	4
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
% Real GDP Growth Rates (X1)	3.90	5.30	3.60	6.20	6.80	5.10	1.60	3.90	4.50	1.90
% Industrial Production Growth Rate (X2)	8.90	12.70	3.60	12.00	9.40	2.70	-3.80	11.10	6.70	1.20
% Ten-Year Government Bond Yields (X3)	7.30	6.90	5.22	5.23	5.48	6.07	6.12	5.78	5.96	5.00
% Change in Stock Market Index (WIG) Returns (X4)	44.92	27.94	33.66	41.60	10.39	-51.1	46.85	18.77	-20.8	26.24
Number of Listings/IPOs (Y)	5	27	20	35	81	33	13	31	38	19

Note: IPOs on the Main Market of the Warsaw Stock Exchange, without Privatisations, only Locals.

Source: OECD Stat Extracts, Warsaw Stock Exchange Fact Books, Polish National Bank Statistics.

Table 2. Analysed Variables.

Data Sources	Calculation	Expected Sign
Warsaw Stock Exchange Fact Books	frequency	
OECD Stat Extracts	annual growth rates in %	+
OECD Stat Extracts	annual growth rates in %	+
Polish National Bank (NBP)	in %	-
Warsaw Stock Exchange Fact Books	in %	+

Source: Own processing.

stock markets is in alignment with investor sentiment theory and the market timing theory. As the stock market index mirrors the investor's willingness to invest or not, the number of IPOs vary accordingly. Enterprises are more likely to implement IPOs when the stock market promises higher returns and therefore profit for enterprises and also for potential investors. Studies by Loughran *et al.* (1994), Ljungqvist (1995), Rees (1997) and Rydqvist, Högholm (1995) detect a significantly positive influence of stock index levels and stock index returns on the number of IPOs. Brzeszczynski (2014) analyzed the number of new IPOs and the main stock market index (WIG) returns for the Polish stock market over a period from 1997 to 2008. He detects the correlation coefficient between those two variables 0.0244 when IPOs and stock market index return are analyzed simultaneously. However, the value of this index is 0.5683 when the WIG returns are lagged by one year. Brzeszczynski (2014) concluded that "the number of IPOs in emerging markets and the profitability of the public offers are related to macroeconomic conditions, business cycles and stock market activity. In most emerging market countries there is a time lag between movements of the stock market index and decisions to launch new IPOs".

This paper is based on evidence from the Polish capital market over the period of 1993 to 2012. Our sample includes only local enterprises that conducted an IPO on the Main Market of the Warsaw Stock Exchange. Privatised companies are excluded from the data processing. The IPO data were obtained from Warsaw Stock Exchange, Federation of European Securities Exchanges and PwC – IPO Watch Europe (2003–2012). Macroeconomic data such as gross domestic product growth rates (GDPGR), reference interest rates (GBY), industrial production growth rates (IPGR) and Warsaw stock exchange index (WIG) were obtained from the Polish

National Bank (NBP), Polish Central Statistical Office (PCSO) and OECD Stat Extracts.

Tables 1 and 2 show the source data, *i.e.* an overview of the variables used for this study.

The following steps were undertaken to analyze the quantitative data:

Firstly, we provide the Spearman correlation analysis in order to investigate the influence of macroeconomic factors on the number of IPOs. The data is evaluated at the significance level of $\alpha=5\%$ and processed in two ways. As follows from the research done (Ameer, 2012; Breininger and Glogova, 2002; Brzeszczynski, 2014; Jargot, 2006), the situation in the year preceding the company's initial public offering is crucial. Therefore, the model uses one-year delay for all the explanatory variables in relation to the dependent variable. The entire statistical evaluation was performed by Statistica.CZ, Version 12. Secondly, the results of the data analysis are discussed in order to draw some specific issues existing in the Polish primary capital market. The research results are also compared with the results of previous IPO studies conducted under conditions of developed and emerging capital markets.

2. Empirical findings

Table 3 gives an overview of descriptive statistics of annual IPOs' time series and macroeconomic indicators. A total of 398 IPOs were listed during 1993–2012 period on the Main Market of the Warsaw Stock Exchange including only local enterprises without privatisations. The total value of capital raised by companies on this market was 104,916 million PLN. Prior the financial and economic crisis (2008–2009), there was a remarkable boom in the number of IPOs which increased from 27 in 2004 to 81 in 2007. The sharp decline in the

Table 3. IPOs in the Polish Capital Market – Descriptive Statistics, 1993–2012.

	Mean	Median	Std	Min	Max
IPO Activity Indicators					
Number of Listings/IPOs	18.95	16.00	17.98	1.00	81.00
Value of IPOs, PLN Million	5,521.91	4,241.00	5,272.63	2.00	18,257.00
Macroeconomic Indicators					
% GDPGR	4.43	4.50	1.78	1.20	7.10
% IPGR	6.65	6.80	4.64	-3.90	13.10
% GBY	16.14	9.65	12.55	5.00	45.10
% WIG	66.76	14.58	238.17	-51.07	1095.30

Note: IPOs on the Main Market of the Warsaw Stock Exchange, without Privatisations, only Locals.

Source: Own processing.

Table 4. Relations between the Explanatory Variables and IPO Numbers
(One Year Shift of the Dependent Variable Relative to the Explanatory Variables).

Spearman correlation analysis				
Variables	Nr of observations	Spearman R	t(N-2)	p-value
X1 & Y	21	0.205	0.91	0.373
X2 & Y	22	-0.192	0.88	0.391
X3 & Y	22	-0.850	-7.22	<0.005
X4 & Y	21	-0.102	-0.44	0.660

Source: Own processing.

number of IPOs in 2008 was followed by a moderate recover of the market with 31 IPOs in 2010. The average GDP growth rate was 4.43 % and reached its peak level of 6.80 % in 2007 although there were remarkable values of this indicator during the whole period 2006–2008. The average industrial production growth rate was 6.65 % with its highest level of 12.70 % in 2004. Spectacular values of this indicator can be also observed in 2006 and 2007. The only negative industrial production rate was registered in 2009 (-3.80 %). The slight downward movement of the ten-year government bond yields displays the loose monetary policy executed by the Polish National Bank since 2009. Average changes in the WIG index returns, the index of the Main List, were 66.76 % while its maximal negative value of -51.07 % was reached in 2008 and its maximal positive value of 89.10 % was reached in 1996.

Table 4 reports results of the Spearman correlation analysis when the dependent variables (X1...X4) and the explanatory variable (Y) are processed with a one-year shift of new IPOs relative to the macroeconomic indicators. The results illustrate the strength and significance of investigated relations.

Using the Spearman correlation analysis a significant difference was found to exist between the number of IPOs and the reference rate at the 5% level of significance ($R_s = -0.850$; $p < 0.05$); thus H2 is supported by the empirical evidence, *i.e.* that IPOs tend to increase when the reference interest rate is decreasing. However, the empirical findings do not support H1, H3 and H4, *i.e.* there is no relationship between the number of listings and the business cycle, industrial production growth and stock market index returns. It cannot be ruled out that these variables proved to be significant if we used a different time series.

3. Discussion and conclusions

In this paper we investigate the influence of local macroeconomic factors, consequently GDP growth rates, the reference interest rate, industrial produc-

tion growth rates and the Warsaw Stock Exchange Index (WIG) returns on the number of IPOs in an emerging market, Poland, over the period of 1993 to 2012. Previous investigations of this issue conducted under conditions in terms of both developed and emerging countries show no consistent results regarding the explanatory power of macroeconomic indicators and the going public activity.

The first conclusion of our investigation is that the GDP and industrial production growth have no statistically significant impact on the number of new issues. This result implies that the business cycle has no direct impact on the IPO activity in the Polish capital market between 1993 and 2012. Building on works by La Porta *et al.* (1997) and Brzeszczynski (2014) and our previous investigations of the Polish primary market between 2004 and 2012 (Meluzin, Zinecker, Łapińska, 2014a; Meluzin, Zinecker, Łapińska, 2014b) our research results do not support the conclusion that “any decision to launch an IPO should be very carefully analysed using not only past financial data for the company, but also macroeconomic forecasts. Poor timing may result in the loss of capital if stock market prices are too low”.

The next conclusion is that the attractiveness of a capital market for investors as measured by the Warsaw stock market index (WIG) does not appear to be an important factor for going public activities. This research result is also in contradiction with findings by Loughran *et al.* (1994), Rees (1997) and Pagano *et al.* (1998) who detected a significantly positive influence of stock index levels and stock index returns on the number of IPOs.

The only macroeconomic factor that has had an explanatory power for IPO numbers is the reference interest rate. The hypothesis supposing a negative relationship between interest rates and the going public activity could be supported by the empirical evidence. Therefore, we could confirm the Ameer's (2012) and Jovanovic, Rousseau's (2004) conclusions that monetary policy has a direct impact on capital markets and that central bank policy affects IPO cycles in emerging markets.

In a future research on the questions analysed in this paper we intend to use panel data for a larger number of emerging capital markets and a wider range of external variables in order to complement the discussion.

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