

# CLUSTERING OF EFFECTIVE INITIAL PUBLIC OFFERINGS ON THE RUSSIAN IPO MARKET

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***Abstract:** Straightforward parameters of IPO market reflecting the number of placements undertaken and the total value of the capital raised in the course of IPO do not provide interesting details. Measurable results of IPO reflect both fundamental factors and speculative factors as well as interpretation of issuer information by investors. As a result, IPO successful at the beginning could become investor's disaster in few weeks or months. The research is filtering out a subset of successful IPOs, which demonstrated the high level of stock exchange quotations for the first trading day following by the quotation after a week, a month and a quarter of trading. Extending the depth of study besides a calendar quarter is getting the risk of reflecting the influence of after IPO business achievements rather than reflecting the value of IPO. Research covers all 154 IPOs that took place in Russia in the period starting from 1996 until 2015 and utilized DEA (Data Envelopment Analysis) method. Research filtered out a subset of successful placements and made evident the clustering of successful IPOs by long phases of IPO market activity and by calendar quarters, which give additional information to the qualified market participants.*

***Key words:** DEA, initial public offerings, data envelopment analysis, Russian IPO market, IPO effectivity, clustering*

***JEL codes:** R53, C50, F30, F31, G15*

## 1. Introduction

Success of the initial public offering an essential goal targeted by all parties involved in the placement. It is natural that objectives of parties involved do not necessarily comply and even contradict to each other. The common approach of study the success forms the view of investors. The evaluation of the IPO success can be provided by several approaches, for example by the expert evaluation, by the assessment of the financial performance of the issuer presented in the financial statements; evaluation of the market price of the issuer's shares, formed in the course of trading on the stock exchange. The price of share, which is determined in the course of daily trades, is the most important parameter for investors and it provides the most objective parameter of the company performance. The success of the IPO from the investor's point of view reflects in the prices of shares in the short term and midterm perspectives and effect of investments. Long term trading values of stock rather reflect management success and current economic trends. Several factors influence the company's stock value: the state of the business at the time of the placement, current market trends as well as factors related to the quality of business management influence at the issuers company development. The more time elapsed after the IPO, the more influence on the outcome of the issuer's business is made by new factors that are not related to placement. For this reason, it is necessary to differ the effectiveness of the IPO at the moment of the placement with the following period and the successful or unsuccessful further development of the company after the IPO.

Public company is usually measured by annual result and further decisions on policy or management changes are largely based on it. It is worth to mention that in some cases special efforts are made in order to make year results look better. Assuming this the period of one year from the placement is the maximum for evaluation of IPO results rather than the further operation of the company, since the impact of macroeconomic or subjective factors on the issuer is minimal and the price of shares reflects the IPO results. The effectiveness of the IPO in this study is determined by several factors: the value of the issuing company securities by the end of

the first day, the first week, month and quarter of trading. While measuring the effectiveness of the IPO the study also takes in the account the amount of capital raised in the placement.

## 2. Methodology and Data

The study used the DEA (Data Envelopment Analysis) method to determine the most effective placements. (Cooper and Seiford, 2006) With the help of this method, a set of data on the activities of many organizations builds the boundaries of production opportunities for the units under consideration and assesses the technical effectiveness of their activities. (Boussofiane et al., 2012) The authors of the data envelopment analysis method are A. Charns, W. Cooper and Rodes - for the first time they proposed the basic approaches in the analysis of the measurement of the effectiveness of organizations, as well as the tools of linear programming. (Charnes et al., 1978) The DEA model considers a set of observation points describing the results of the independent production units – Decision Making Units (DMU). DEA method has not previously been applied in analyze of the Russian IPO market.

In the context of an IPO, the DEA method was applied to evaluate the effectiveness of the initial public offering in the US by Greg Gregorio and Meir Coulee (Gregoriou, 2008). The purpose of research was to determine the most effective primary public placements for investment. In their work, three models of efficiency were used: basic, crossover and super-efficiency.

The DEA method allows using various parameters for describing the inputs and obtaining output parameters. When specifying the output parameters – factors describing the IPO market, it is possible to identify both effective and ineffective IPOs. Further analysis of the Russian IPOs parameters, determined as effective, will allow to see the IPO clusters on the Russian IPO market. The purpose of the research is to determine the set of effective IPOs, which can be compared with different phases of the IPO waves, and will allow finding the best time for successful IPO.

The analysis utilizes the basic efficiency DEA model. Input parameters (i) are described by general IPO indicators that are supposedly determining medium- and short-term results: IPO volume, which indicates the price of IPO stock on the day of its placement (multiplied by the number of placed shares); stock price at the moment of placement; the minimum and the maximum stock price on the first day of offering. The following parameters are selected for output parameters (j): the change in the stock price by the end of the first trading day (reflects the result of the first trading day); change in the stock price after the trading week (reflects the weekly return on the IPO); change in the stock price after the month and the quarter of trading (reflecting the monthly and quarter returns; see table 1).

It is important to mention that this choice of parameters reflects evaluation of IPO effectiveness from the point of view of the investor. This type of effectiveness can be accurately calculated, as it is well provided with accurate and objective stock exchange data.

**Tab. 1** Russian IPO effectiveness evaluation: parameters for DEA method

Parameter description	Units	Variable
Input parameters		
IPO Volume	\$ bn (USA)	IPOvolMln\$
The stock price at the moment of placement	\$ bn (USA)	openV
The minimum stock price, first trading day	\$ bn (USA)	Inf
The maximum stock price, first trading day	\$ bn (USA)	Sup
Output parameters		
stock price change, end trading day	%	1day%
stock price change, end first trading week	%	1week%
stock price change, end first trading month	%	1mth%
stock price change, end first trading quarter	%	1qrt%

Source: Prepared by the author

DEA model with selected IPO effectiveness parameters could be presented by for the following formula:

$$h_j^* = \max \frac{u_1 1day\% + u_2 1week\% + u_3 1mth\% + u_4 1qrt\%}{v_1 IPOvolMln\% + v_2 openV + v_3 Inf + v_4 Sup} \quad (1)$$

where:  $h_j^*$  – IPO effectiveness in the Russian IPO sample,  $u_i$ ,  $v_i$  – coefficients of incoming and outgoing parameters, respectively.

The results can take a value in the range 0-1. An IPO is considered to be effective if the value of the indicator approaches or reaches 1. The study covers the IPO data of Russian companies in the period 1996 to

2015. A total of 153 IPOs were made during this period. Data on some companies were excluded from the analysis due to inconsistency of information (companies were either delisted or ceased to exist).

The Russian IPO market has key features: relatively low liquidity due to insufficient demand in the local market; a significant proportion of depositary receipts in the total volume of securities; the relative weakness of Russian financial institutions and the inefficiency of the market and limited access of foreign investors. Traditionally, mostly large Russian companies practice raising capital through IPO. Investors, on the other side, are aimed to invest in the largest national companies with a low level of risk. Moreover IPOs in Russia are used not only for raising capital, but also to fulfill secondary tasks – withdrawal of funds to international capital markets and change of ownership.

The calculation was performed using OSDEA modeling software OSDEASolver-v0.287. To obtain a more complete result, the most efficient issuers indicated at the stage were excluded from the range before performing the next stage of the analysis determining the next stage of the effectiveness.

### 3. Results and Discussion

As a result, 45 of the most effective IPOs out of slightly more than 150 instances were selected that represent 29% of all Russian companies IPOs and the four most profitable placements. Using a phased elimination of the most effective companies, it was possible to identify 4 levels of efficiency: from the most effective – the level of effectiveness 1 to level 4. Results are given in table 2.

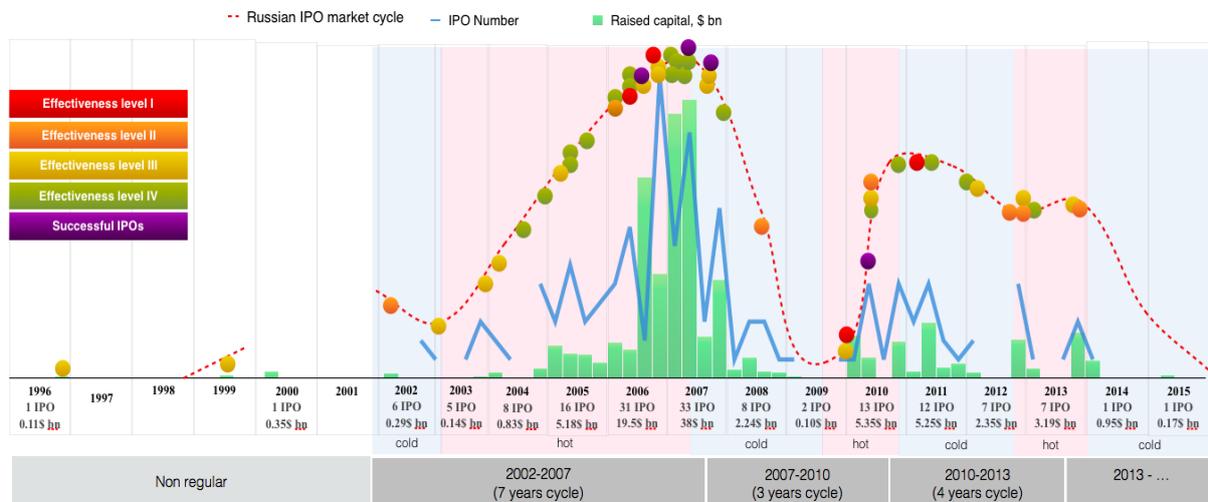
**Tab. 2** Russian IPO effectiveness evaluation: DEA method parameters

Company	IPO date	IPO Volume (\$ mln)	Stock Exchange	Industry
Effectiveness level I				
Энел ОГК 5	2006, Oct	459	RTS/MMVB	Power Engineering
Matra Petroleum	2006, Apr	12	LSE/AIM	Oil and gas
Институт стволовых клеток Человека	2009, Dec	5	MMVB	Biotechnology
Federal Grid Company of Unified Energy System	2011, Mar		LSE	Power Engineering
Effectiveness level II				
РосБизнесКонсалтинг	2002, Apr	13.28	RTS/MMVB	Media
Aurora Russia	2006, Mar	109	LSE/AIM	Financial services
Акрон	2008, Aug	3	LSE	Chemical industry
РУСАЛ	2010, Jan	2240	HKEX	Metallurgy
Мультисистема	2012, Dec	3	MISEX-RTS	Power engineering
Левенгук	2012, Dec	3	MISEX-RTS	High tech
ТПГ АЭССЭЛЬ	2013, Nov	6	MOEX	Industrial production
Effectiveness level III				
ВымпелКом	1996, Nov	110.8	NYSE	Telecommunications
Голден Телеком	1999, Sep	144.2	NASDAQ	Telecommunications
АПК Хлеб Алтая (ПАВА)	2005, Mar	8	RTS/MMVB	Food
Транс Сибирь	2003, Nov	27.1	LSE/AIM	Metallurgy
Petronet Resources	2006, Sep	15.6	LSE/AIM	Oil and gas
Центр международной торговли	2006, Dec	105.3	RTS	Real estate
Распадская	2006, Nov	316.7	RTS/MMVB	Coal
ДВМП	2007, Jul	206	RTS/MMVB	Transport and logistic
Армада	2007, Jul	29.8	RTS/MMVB	High tech
Exilon Energy	2009, Dec	100	LSE	Oil and gas
ДИОД	2010, Jun	10	MMVB	Pharmaceuticals
ЕРАМ Systems	2012, Feb	72	NYSE	High tech
Руспетро	2012, Jan	250	LSE	Oil and gas
АЛРОСА	2013, Oct	1304	MOEX	Metallurgy
Аптечная сеть 36.6	2003, Jan	14.4	MMVB	Pharmaceuticals
Иркут	2004, Mar	127	RTS/MMVB	Aviation
Effectiveness level IV				
Victoria Oil and Gas	2004, Jul	18	LSE/AIM	Oil and gas
Открытые Инвестиции	2004, Nov	68.8	LSE/AIM	Real estate

Новатэк	2005, Jul	878	LSE	Oil and gas
Овса Gold	2005, Jun	3	LSE/AIM	Metallurgy
Соллерс	2005, Apr	135	RTS/MMVB	Automotive
СТС Медия	2006, Jun	346	NASDAQ	Telecommunications
Верофарм	2006, Apr	139.7	RTS	Pharmaceuticals
Группа Разгуляй	2006, Mar	144	RTS/MMVB	Foodstuffs
Уралкалий	2007, Oct	948	RTS/MMVB/LSE	Petro chemistry
Росинтер	2007, Jun	100	RTS/MMVB	Trade
РТМ	2007, May	92	RTS/MMVB	Real estate
Фармстандарт	2007, May	880	RTS/MMVB/LSE	Pharmaceuticals
Волга Газ	2007, Apr	135	LSE/AIM	Oil and gas
Фармсинтез	2010, Nov	17	MMVB	Pharmaceuticals
Протек	2010, Apr	400	RTS/MMVB	Pharmaceuticals
Polymetal	2011, Oct	785	LSE	Metallurgy
Яндекс	2011, May	1304	NASDAQ	Telecommunications
CIS Acquisition	2012, Dec	40	NASDAQ	Financial services
Successful IPOs with highest volume				
Rosneft	2006, Jul	10600	RTS/MMVB/LSE	Oil and gas
Sberbank	2007, Feb	8800	RTS/MMVB	Financial services
VTB	2007, May	7940	RTS/MMVB/LSE	Financial services
Rusal	2010, Jan	2240	HKEX	Metallurgy

Source: Prepared by the author

**Fig. 1** The most effective and profitable IPO on the Russian IPO market, 1996-2015

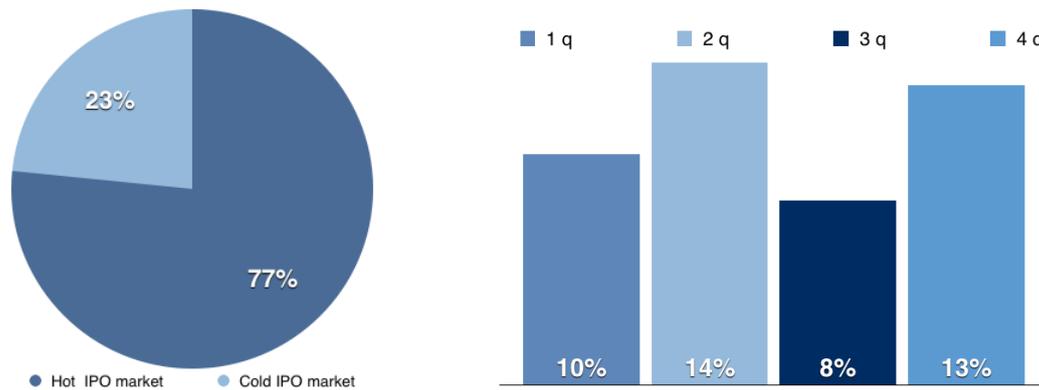


Source: Prepared by the author as the result of DEA modeling

Figure 1 presents graphical interpretation of the results achieved. It reflects parameters of 45 the most successful IPO placed on the chart. The chart represents both information on the number of IPOs performed per year and the total IPO volume per year. The resulting curve of multiplying IPO quantity and volume formed on the logarithmic scale reflects activity of the Russian IPO market during the period studied which has cyclical nature.

The most effective and profitable placements took place on the rise of IPO waves and tend to form clusters. The three main clusters are visible: the largest was formed in the period 2006-2007 at the stage of high activity in the IPO market, this cluster consists of 19 IPOs. The second cluster is much smaller in size (9 IPOs), formed from the end of 2003 to 2005. The third cluster consists of 6 IPOs that took place between the end of 2009 and the beginning of 2010.

**Fig. 2** The most effective and profitable IPO on the Russian IPO market, 1996-2015 гг. (by phases of cycle, by quarters)



Source: Prepared by the author as the result of DEA modeling

Market conditions depend, in particular, on the political situation, competitive environment, interest rates, inflation, economic forecasts. Help in determining the most successful IPO moment is provided by the underwriter, who investigates market trends and follows the investors' mood.

The majority of effective placements were realized in the second quarter, due to the traditional rise in activity. At this period of time, issuers expect an increase of activity of investors. A significant number of placements occur in the 4th quarter before the closing of the reporting period. However, the minority of effective and profitable placements took place in the 3rd quarter – the most inactive due to the high season of vacations in the summer. According to the analysis, 36 of the selected companies conducted an IPO in the "hot" IPO market, which is 77% of the total sample.

There is no general solution of the IPO timing problem in the scientific and business communities. The decision of the issuing company about the placement time comes from many factors, aiming not only to place stocks at the highest possible price and maximize the rising capital, but also to ensure high profitability after the IPO. The issuer considers its financial and stock exchange conditions, regulatory requirements, as well as additional external factors, both economic and human. The issuer's decision to conduct an IPO and choice of the time for achieving the best results can be divided into two main groups:

- External factors that depend on the market situation. This group can include international and national events that affect the development of the IPO market, as well as macroeconomic parameters.
- Internal factors that depend on the state of the issuer's business, including microeconomic parameters, current market conditions, business management culture and growth prospects.

Market conditions depend, in particular, on the political situation, competitive environment, interest rates, inflation, economic forecasts. Help in determining the most successful IPO moment is provided by the underwriter, who investigates market trends and follows the investors' mood.

The IPO market cycle, that reflects the mood of investors, has a great influence on the choice of the moment for buying, selling or holding. On the other hand, that affects the amount of raised capital, as well as the success of placement. Emissive activity of companies is subject to significant fluctuations from year to year. Investors are tending to overestimate the company's shares potential because of optimistic sentiment at the market, which serves as an additional incentive for firms to enter the market. The issuing company, as a rule, pursues the main goal in carrying out an IPO – raising the maximum amount of capital. In the case of a favorable situation, it can attract a much larger amount of funds than the one that it can claim in other conditions.

Companies are trying to spot the best periods of time when IPO launching meets high investors' optimism, thereby reducing their costs of transformation into a joint stock company. During the upsurge of economy, companies are opened for investment opportunities, therefore, a greater number of firms seeking to involve additional financial resources, which increases the number of IPOs conducted, thereby exacerbating the problem of unfavorable selection. Unsuccessful timing for an IPO may affect the exchange value of the issuer's securities, and the issuer will have to reduce the cost of its offer to attract investors. The most obvious risk is the failure of trading. It would mean that all the funds that were prepared for the IPO were wasted, and the issuer's business reputation suffered a lot.

Possibility of entering the stock market and the IPO process involves a large number of participants, who tend to have different, and often conflict goals (table 3).

**Tab. 3** Conflict of participant's goals during the initial public offering process

Participants	Matching goals		Conflict goals
Company	Company value growth	Ensuring of shares liquidity	Maximization of income from the sale of securities
Selling shareholder	Increase of the market value of outstanding shares	Preservation of outstanding shares liquidity	Maximization of income from the sale of securities
Investors	Increase of the market value of the acquired shares	High liquidity of acquired shares	Acquisition of shares at a low price
Agent	Participation in a successful transaction	Minimization of transaction costs	Maximization of income from the sale of securities

Source: Prepared by the author

The investor is aimed to acquire cheaper stocks with the hope of increasing their value in the future, on the contrary, the issuing company, tries to maximize the raised capital during the IPO. In addition, sometimes an IPO participants implement indirect goals: privatization, change of ownership, and withdrawal of cash or simply takeover of the company. For this reason, investors who are familiar only with the official IPO documentation may not know the details of the placement. In such cases, the general rules for choosing the moment for an IPO placement will not greatly influence the outcome although the public information about that kind of issuers will not significantly differ from the "usual" IPOs.

#### 4. Conclusions

It should be noted that the ratio of effective IPOs to the total volume of placements in Russia for the year does not follow a normal distribution, which indicates the impact of the cyclicity of the IPO market on the success and effectiveness of placement.

The most profitable IPOs of national companies took place on foreign stock exchanges (61%) and only 61 companies out of 153 conducted IPOs on the national stock exchanges (39%). In addition, some Russian IPOs were made according to the scheme of "double placement" - on the foreign and national stock exchanges at the same time. Excluding "double placement" IPOs leads to only 52 "purely" Russian IPOs (34%) in the studied period from 1996 to 2015. Western stock markets are more attractive for issuers by many reasons: the diversity of investors, market liquidity and diversification of country risk. Russian issuers among all foreign stock exchanges prefer the European stock exchanges, mainly the LSE. Despite the fact that historically most Russian issuers look positive for placement on the global sites, the study shows that the most effective Russian IPOs were made on the national stock market.

The longer horizons of assessments: six months, a year and over, will require to comprehend additional parameters reflecting the national and global economies factors as well as the use of more complex models requiring a larger sample. The Russian IPO market now cannot provide such sample thus setting limits for the study with greater accuracy and reliability. There is no evident solution found to the IPO timing based upon the sample studied. Still successful placements tend to cluster at the peak of the IPO activity cycle and this fact should be seriously be taken into the account by the ventures exploring IPO opportunities in order to select proper timing. Unsuccessful timing for an IPO may affect the exchange value of the issuer's securities, and the issuer will have to reduce the cost of its offer to attract investors. The most obvious risk is the failure of trading. It will mean that all the funds that went to prepare for the IPO were wasted, and the business reputation of the issuer suffered significant damage.

It should be noted that the ratio of effective IPOs to the total volume of placements in Russia by the year doesn't show a general distribution, which indicates the IPOs success and efficiency impact on the IPO market cycle. It should be noticed that in the current DEA model, an evaluation of efficiency with short and medium-term horizons is made. The longer horizons of assessments, for six months, a year or more, will require the inclusion of additional variables describing the state of the national and global economies. Taking into account the subjective factors affecting the market, which require the use of more complex models and much larger sample, which at the moment can't provide the Russian market IPO (in the Russian market for 20 years, was held slightly more than 150 placements, which is not dos sampling for the study with great accuracy and reliability).

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