# WESTERN-STYLE CAPITAL MARKET REFORMS IN RUSSIA: IMPLICATIONS FOR MARKET EFFICIENCY AND FIRMS' FINANCING DECISIONS

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OPEN ACCESS

**How to cite this paper:** Kim, O. (2020). Western-style capital market reforms in Russia: Implications for market efficiency and firms' financing decisions. *Risk Governance and Control: Financial Markets & Institutions, 10*(3), 62-74. http://doi.org/10.22495/rgcv10i3p5



**ISSN Online:** 2077-4303
**ISSN Print:** 2077-429X

**Received:** 08.08.2020
**Accepted:** 30.09.2020

**JEL Classification:** G15, G32
**DOI:** 10.22495/rgcv10i3p5

## Abstract

Over the past decade, the Russian government implemented numerous reforms aimed at attracting investor capital and improving the capital market conditions. These reforms included adoption of stringent listing regulations and governance norms, revisions in the tax and ownership laws, restructuring of the major stock exchanges, and more importantly, adoption of International Financial Reporting Standards (IFRS) in 2011. We employ an adaptive market hypothesis (AMH) perspective formulated by Lo (2004, 2005) to examine whether the informational efficiency of the market changed over time as a result of these reforms. While we report that the Russian stock market is still not weak-form efficient, as it was before the reforms, we find the evidence of improvement in efficiency over time. Next, we find that financing decisions of Russian public firms changed following adoption of IFRS when financial statements became more transparent and better aligned with informational needs of local and foreign investors. Particularly, Russian companies that adopted IFRS were more likely to raise finance via issuance of equity rather than debt instruments, whereas for non-adopters there was no change in the firm capital structure. Finally, we report that there was an increase in the inflow of foreign direct investments (FDI) in the post-reform period, suggesting that the above noted reforms conferred significant benefits to the entire Russian economy.

**Keywords:** IFRS Adoption, Russia, Capital Structure, Market Efficiency

**Authors' individual contribution:** The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

**Declaration of conflicting interests:** The Author declares that there is no conflict of interest.

## 1. INTRODUCTION

Over the past two decades, emerging markets have been on the rise and the global investments in their equity instruments have increased substantially. Nevertheless, the benefits that accrue to national economies due to the markets growth are incredibly sensitive to an array of home-country institutional arrangements, including the strength of the regulatory environment, shareholder protection rights, the maturity of the national stock market, and more importantly, informational (reporting) transparency (Hongcharu, 2006; Kalra & Alexander, 2011; Braendle, Omidvar, & Tehraninasr, 2013). Therefore, supporting the capital market growth first requires continuous injection of capital and second, it involves a broad spectrum of reforms in the above mentioned areas.

In this study, we examine changes in the informational efficiency of the Russian stock market over time and we document that, although the market is still not weak-form efficient, it has become

more efficient following a course of radical capital market reforms. We employ an adaptive market perspective, formulated by Lo (2004, 2005), which is a more recent refinement of the efficient market hypothesis. This framework suggests that markets evolve over time and due to evolutionary processes, they become more efficient. Next, we rely on the pecking order and the information risk theories (Myers & Majluf, 1984) to investigate whether or not Russian public firms were more likely to raise capital via issuance of equity rather than debt instruments, in the post-reforms period. We document that public firms committed to adoption of International Financial Reporting Standards (IFRS) attracted more equity, rather than debt, capital, unlike their peers that did not make such a commitment. Moreover, since the inception of the capital market reforms, the inflow of foreign direct investments (FDIs) experienced a threefold increase, indicating that the entire Russian economy benefited from them. We conclude that the ambitious reforms implemented by the Russian government over the past decade were beneficial to both the Russian stock market and the global investment community.

Prior literature has increasingly focused on the benefits and costs brought about by the process of capital markets integration for emerging markets groups, among which the countries of the Soviet Union (nowadays, CIS) stand out due to their not so distant communist past and a unique process of formation of the capital market system (Melloni, 2009; Kim, 2017). Within the CIS, the Russian stock market occupied the leading position due to its remarkable growth in the number of listed companies, the total market capitalization, and the amount of the attracted capital as indicated by World Federation of Exchanges[1]. In order to sustain the growth and also under pressure from the global investment community, the Russian government implemented multiple reforms including revisions in the tax law and minority shareholders' protection rules, formation of a unified platform, the Moscow Exchange[2], and most notably, adoption of the IFRS (Kim, 2013a, 2016a). At present, the Russian stock market is mildly integrated with other global markets, and a number of foreign issuers trade their stock on the Moscow Exchange. In addition, Russian blue chips have successfully cross-listed in New York and London beginning in 1996, occupying a leading position in the market of Global Depositary Receipts (GDRs) of the London Stock Exchange (LSE) (Kim, 2013b).

Despite the fact that the above noted changes began circa 2007, the extant literature provides limited evidence on the benefits associated with the ambitious program of reforms implemented by the Russian government. Studies examined changes in value relevance of information over time (Kim, 2013a), the market valuation of Russian GDRs (Kim, 2013b), and the factors affecting adoption of the global reporting rules, IFRS, in the content of their co-existence with the local accounting standards (RAS) (Alon, 2013). Our study continues along the line of research that attempts to quantify the outcomes of the progressive capital market developments for the Russian market, focusing on one important attribute – informational efficiency. The experience of the Russian market, which is among the leading emerging economies, establishes an important precedent for the rest of the emerging markets community. This study, therefore, contributes to the emerging markets stream of literature.

Prior studies examined the impact of improvement in informational transparency as a result of capital market reforms, employing different metrics and across various settings. Particularly, tests for changes in the cost of capital, market value, and reporting quality of public firms became pervasive and the literature provides voluminous evidence for emerging and transition markets. The general conclusion from the extant studies is that the Western-style capital market reforms in those markets, including adoption of IFRS, entail significant economic benefits when supported by proper infrastructure and implemented concurrently with changes in other regulations (Christensen, Hail, & Leuz, 2013). Kim (2016a) reports that Russian public firms overall benefited from adoption of IFRS and concurrent changes in regulations, despite the fast path at which the reforms were implemented. On the other hand, studies documented limited benefits to implementation of the capital market reforms and a negative market reaction to this event in the cases of countries with limited resources. This revealed investor skepticism towards the actual achievement of the ultimate goals of these reforms, namely improving the information environment of the national market (Armstrong, Barth, Jagolinzer, & Riedl, 2010, Karampinis & Hevas, 2011). We contribute to this debate and report evidence that suggests that limited resources and imperfections of the legal system, the two major attributes of emerging markets, do not equally affect the degree of success of the capital market reforms implemented within emerging markets. Rather, each market possesses a unique set of characteristics and internal resources that ultimately define whether it is predisposed to success or failure when Western-style capital market reforms are implemented.

The study proceeds as follows. Section 2 is dedicated to the literature review and testable predictions. Section 3 describes the research design and provides the details of the data collection process. Section 4 reports the results of the empirical tests, and Section 5 concludes the study.

## 2. LITERATURE REVIEW AND TESTABLE PREDICTIONS

### 2.1. Market efficiency: The "conventional" market efficiency hypothesis and the more recent adaptive market perspective

The seminal studies of Fama (1965) formalized the term "market efficiency" and defined it as the ability of the market to incorporate promptly information into stock prices. Fama further outlined the major provisions of the efficient market hypothesis (EMH) and classified the market efficiency into a weak-form, a semi-strong form, and a strong-form. The present study focuses on the weak-form efficiency of the Russian market, which implies that stock prices fully and instantaneously incorporate

[1] http://www.world-exchanges.org/home/
[2] https://moex.com/en/

past trading information. Prior to Fama's seminal works, studies generally found support to the efficient market hypothesis, using simple serial correlation and trading rules tests. Nevertheless, a post-1970s stream of literature, employing a variety of more advanced testing methodologies (unit root, long memory, rolling tests, etc.), generally concluded that markets were not weak-form efficient. Studies were conducted across different markets, regions, and time-periods, and their findings are largely conflicting.

Lim and Brooks (2006) surveyed the market efficiency literature and determined that findings are contradictory even for the same stock markets, primarily due to differences in methodologies and time-periods. More recently, the literature increasingly focused on emerging markets due to the process of integration of capital markets and the shift in global equity trades towards these markets. On one hand, emerging markets are characterized by underdeveloped infrastructure and the general perception is that they are speculative in nature. On the other hand, these markets underwent significant changes because of capital market reforms, as in the case of Russia, which raises an expectation of improvement in efficiency over time. Chakraborty (2006) and Hassan and Chowdhury (2008) reported market inefficiency for Bangladesh and Pakistan, respectively. Squalli (2006) concludes that the United Arab Emirates stock exchanges were inefficient. In the case of the post-Soviet countries, the studies of Kim (2016b) and Kim (2017) provide evidence that contradicts the weak-form efficiency for the Russian and Kazakhstani stock markets, respectively. Based on data from 1995-2008, Chong, Cheng, and Wong (2010) showed that the Russian market was the least efficient among the four BRIC countries. Nevertheless, the studies of Al-Khazali, Ding, and Pyun (2007) reports evidence consistent with market efficiency for several Middle Eastern markets, whereas Smith (2009) provides similar evidence for Poland. In global settings, Karemera, Ojah, and Cole (1999) documented weak-form efficiency for 15 emerging markets. For the Russian stock market, Jithendranathan (2006) documented that there were no profitable arbitrage opportunities for Russian cross-listed stocks.

In an attempt to reconcile conflicting evidence regarding market efficiency, Self and Mathur (2006) suggest that there are periods of time when markets are efficient but there are also periods when markets have informational anomalies, in which case researchers documented departure from the market efficiency. This suggests that the efficiency of the market can change (evolve) over time as a result of the institutional changes, market restructuring, and technological innovations (Lim & Brooks, 2011). Moreover, in their early study, Grossman and Stiglitz (1980) propose that informationally efficient markets are impossibility: if markets were efficient, there would be no reason to trade and capital markets would eventually collapse. The authors conjecture that sufficient profit opportunities must exist to compensate investors for the cost of trading and processing information.

In his landmark study, Lo (2004) formulated this idea of viewing capital markets from the evolutionary perspective, which became known as the adaptive market hypothesis (AMH). Lo proposed that departures from economic rationality, such as investor overreaction, mental bias, etc., are, indeed, consistent with an evolutionary model of market development. In a follow-up study, Lo (2005) outlines the major principles of the AMH and suggests that the temporal informational anomalies are behavioral in nature and are consistent with an evolutionary process whereby individuals make mistakes, learn from those mistakes, and adapt to changing market conditions. Competition and adaptation, Lo (2005) argues, lead to the natural selection process that shapes market ecology. Ultimately, evolution (in this study, reforms) determines the new market dynamics and structural changes, commonly interpreted as irregularities and departures from the efficient market hypothesis. Lo (2005) suggests that this novel perspective may reconcile many contradictions between the efficient market opponents and behavioral studies.

This new perspective on market efficiency has important implications for investor trading. Particularly, it suggests that profitable opportunities do exist from time to time because of changing market conditions, but market traders typically quickly exploit those. Daniel and Titman (1999) refer to this process of co-existence of short-term profitable opportunities in the otherwise efficient market as "adaptive efficiency". As investors learn more about the price history, profitable opportunities gradually decline and the market starts exhibiting the behavior consistent with a weak-from efficiency. This also suggests that the market could deviate from efficiency during the period of structural changes, but gradually it would become more efficient.

Significant frictions and high transaction costs (State Street Global Advisors, 2015) characterize the Russian market, raising an expectation that it may not be weak-form efficient, and the study of Kim (2016b) provides evidence consistent with this claim. Particularly, the author reports that Russian GDRs listed in London are not priced efficiently and that profitable arbitrage opportunities are not realized quickly enough. Nevertheless, beginning in 2007, the national government launched a course of progressive reforms aimed at improving the informational efficiency of the stock market. In 2007-2008, MICEX, one of the two major stock exchanges, first introduced a corporate governance code with which public firms had to comply, and second, established a new clearance system similar to Euroclear and Clearstream in the European exchanges. As reported in Kim (2013b, 2016a), in 2009-2011 the tax and corporate laws were revised to guarantee additional protection to minority shareholders and foreign investors. The new shareholder agreement, introduced in 2010, was aimed at protection of voting rights and enhanced transparency in the shareholder – creditor disputes resolution. The transfer pricing regulation was overhauled in July 2011, and required significant disclosure of controlled transactions and related party lists, and special provisions on cross-border transactions were introduced. Next, the main stock exchanges, RTS and MICEX, merged into the Moscow Exchange in 2011 and conducted a successful public offering, which significantly improved the liquidity and investor base for local firms and enhanced

settlement efficiency. Following this arrangement, significant penalties for non-compliance with the stock market regulations and trading/listing rules were introduced (Federal Commission for Securities Markets (FCSM)[3]; Moscow Exchange). Most importantly, beginning in 2011, Russian public companies were required to prepare Consolidated Financial Statements in accordance with IFRS, which was expected to decrease the level of information asymmetry and attract foreign capital. Kim (2016a) reports that these important reforms overall improved the reporting quality of the Russian public companies, although she does not examine changes in market efficiency over time.

This discussion, in conjunction with the adaptive market perspective noted above, raises an expectation that the informational efficiency of the Russian stock market would improve over time as a result of evolutionary processes driven by an array of capital market innovations. This gives rise to our first prediction:

*H1: Informational efficiency of the Russian stock market improves over time.*

## 2.2. Pecking order theory, informational risk, and a firm's capital structure

The pecking order theory that originated in studies of Myers (1984) and Myers and Majluf (1984) posits that firms choose strategies that allow them to minimize the cost of raising external finance. In brief, equity financing is subject to a greater adverse selection problem, from the investor's point of view, and is, therefore, riskier, compared to debt financing. Retained earnings, on the other hand, are not subject to adverse selection and should be preferred to debt and equity financing. Overall, information asymmetry is predicted to determine the capital structure of debt versus equity issuance. Prior studies, nevertheless, provided conflicting evidence in support of the pecking order theory. The studies of Fama and French (2005), Shyam-Sunder, and Myers (1999) found that pecking order does explain firms' capital structure decisions. Frank and Goyal (2003) reported that the pecking order evidence exists but only for large firms and selective time-periods. Conversely, Helwege and Liang (1996) found that firms accessing capital markets do not follow the pecking order when choosing the type of security to offer. In line with their findings, Leary and Roberts (2010) and Graham, Leary, and Roberts (2015) found no evidence of firms following the pecking order when making financing choices.

A significant stream of literature examined the impact of information risk reduction through various channels, including improved reporting transparency, analysts' forecasts, etc. on changes in the cost of capital, market value, and reporting quality of public firms (see Ahmed, Chalmers, and Khlif, 2013, for an overview of findings). In fact, volumes of studies exist across various settings, and these suggest that public firms generally benefit from increased transparency. The adoption of IFRS represents a strong setting for testing the provisions of the pecking order and the information risk theory because this important reporting reform substantially alters the information environment of public firms. As of 2016, more than 120 nations committed to adoption of IFRS at a national level, including emerging markets such as Russia[4]. Kim (2013a) extensively discusses the path the Russian community went through before finally adopting the IFRS in 2011. Since 2012 (2011 is the first adoption year), Russian public companies are required to prepare Consolidated Financial Statements. Experts believe that this fundamental reform, originally implemented within the European Union and deemed to suit Western markets to a greater extent than emerging markets, would better align the Russian reporting environment with the informational needs of foreign investors, resulting in inflows of foreign funds.

Prior literature extensively documented that IFRS are of higher reporting quality, compared to the national accounting standards, suggesting that their adoption would raise the quantity and quality of reported information (Barth et al., 2008, 2012). Additionally, studies suggest that this reform is almost always accompanied by adoption of new stringent enforcement rules (Daske, Hail, Leuz, & Verdi, 2008, 2013). In Russia, this reform was also accompanied by changes in other regulations, as noted previously (Kim, 2016a). To the extent that IFRS adoption can reduce information asymmetry between public firms and investors, it would be reasonable to expect that firms would start choosing external (equity) capital over debt financing post IFRS adoption, as predicted by the pecking order and the information risk theories. Finally, studies reported that IFRS adoption at a national level has a positive spillover effect and networking benefits for the entire market, not limited by IFRS adopting firms. We state our next prediction in an alternative form:

*H2: Russian public firms would rely more on equity financing, rather than debt financing, following the IFRS adoption and other regulatory reforms.*

Lastly, our extended investigation suggests that not all public firms adopted IFRS and there was a significant number of non-adopters, although changes in other regulations affected, indeed, both categories of public firms (Kim, 2016a). One would expect that IFRS adopters would experience a greater shift towards equity financing, compared to non-adopters, due to more significant changes in the information environment. The next prediction is:

*H3: IFRS adopters would experience a greater shift towards equity financing, as opposed to non-adopters, following the IFRS adoption reform.*

## 2.3. Arguments against information benefits of Western-style capital market reforms in the case of emerging markets

While we expect that the IFRS adoption would benefit public firms and the Russian market as a whole, there are reasons to believe that benefits of the reforms would not materialize. The IFRS adoption at a national level is oftentimes a necessary

[3] www.fcsm.ru

[4] We omit the description of the global adoption of IFRS here because it received substantial coverage in prior literature and is not the primary focus of this study. For more details on pros and cons of global adoption of IFRS, see Ball (2006), Barth, Landsman, and Lang (2008), Barth, Landsman, Lang, and Williams (2012), among others. Ahmed et al. (2013) surveyed the literatures examining economic consequences of IFRS adoption.

condition of the assistance package of the international donors – IMF, World Bank, etc. – to emerging markets. Although these international donor organizations provided invaluable monetary and technical assistance to emerging nations, their interventions in the national course of reforms raised substantial criticism. Arnold (2015) argues that these global market makers "are not necessarily representative of broader societal interests", and that the World Bank and IMF can be regarded as the colonizing influences arising from the process of globalization (Weetman, 2006). The author noted that financial markets are often powerless in the face of inevitable changes driven by globalization. One could make the analogy regarding the global adoption of IFRS in that emerging markets are often under the heavy influence of external stakeholders to implement this reform. Several studies identified the influences of the global donors on the reporting practices of emerging nations. Mir and Rahaman (2005) reported that the Bangladeshi government's decision to adopt international reporting standards was made under pressure from international players such as IMF and that the nature of this reform was undemocratic, leading to high resistance and low compliance with IFRS. Uddin and Tsamenyi (2005) examined the implications of the World Bank sponsored public sector reforms in Ghana. They noted that "reporting to the monitoring agency did not make any positive changes to accountability and performance and was thereby unable to serve public interests" (p. 667). King, Beattie, Cristescu, and Weetman (2001) highlighted the challenges that the Romanian professional community faced in the late 1990s when the European-style reporting reforms were introduced. More recently, Kim (2017) described the resistance of the local community towards adoption of IFRS in Kazakhstan, Russia's closest peer.

To conclude, adoption of IFRS in emerging markets was more of a legitimization step to increase the credibility of arrangements between a country and international donors such as the IMF and the World Bank. Weetman (2006) suggested that "these influential institutions are imposing a cultural framework as well as an institutional framework and that some aspects of this culture may be unfamiliar or even alien to the countries receiving aid" (p. 355). This discussion suggests that the benefits of adoption of IFRS and other reforms in Russia may be more limited than often anticipated and are ultimately an empirical question.

## 3. RESEARCH DESIGN AND DATA COLLECTION

### 3.1. Informational efficiency

Earlier studies examining the market efficiency employed a simple serial correlation test, pioneered by Fama (1965). This test if fairly simplistic and only requires than changes in prices are uncorrelated over time. In the past three decades, the literature suggested alternative methodologies to test the weak-form of market efficiency. The unit root test has become pervasive in the market efficiency literature (Lim & Brooks, 2011). The earlier studies implemented conventional Augmented Dickey-Fuller (ADF) test: a market is weak-form efficient if price/return series have a unit root and are non-stationary (Kim, 2016b). On the other hand, stationarity in return series suggests that they are predictable and that investors are likely to make systematic profits on trading with the stocks under examination. The ADF statistic is a negative number and is assessed against MacKinnon (1996) critical levels. The more negative the value of this statistic, the stronger the rejection of the null hypothesis that series have a unit root.

More recently, the conventional ADF methodology has been improved and the test incorporates the possibility of a structural break. The researchers suggest one can interpret a structural break in the return series as a presence of a unit root, leading to under rejection of the null hypothesis (Lim & Brooks, 2011). The importance of this ADF test refinement was demonstrated in the studies of Lean and Smyth (2007), documenting a lack of market efficiency for several Asian markets but only when the test allowed for multiple structural breaks. Ozdemir (2008) reported similar findings for the Istanbul Stock Exchange. Overall, it appears that stationarity in return series may only emerge when the ADF test allows for a possibility of structural breaks.

We follow this stream of research and examine the weak-form of the Russian stock market efficiency using the ADF test with a structural break. Using Datastream, we download the historical daily values of the major equity trading platform, MICEX, price index beginning on September 22, 1997 (base date), and until November 9, 2016 (when the present study was implemented)[5]. We perform the logarithmic transformation of the MICEX index price series, consistent with prior research (Campbell, Lo, & MacKinlay, 1997):

$$R_{it} = \ln(P_t/P_{t-1}) \quad (1)$$

There are 4,992 return series observations computed in accordance with Model 1. To examine the changes in market efficiency over time, we break down this sample into the pre-IFRS adoption period (September 22, 1997 – December 31, 2011) and post-IFRS adoption period (January 1, 2012 – November 9, 2016). We perform the ADF test with a structural break separately for these two sub-periods. We expect the ADF test statistic to become less negative in the post-adoption period, indicating an improvement in market efficiency over time, therefore supporting *H1*.

### 3.2. Firms financing decisions

To test the *H2* and *H3*, we model the probability of firms changing their financing decisions in favor of the equity, rather than debt instruments, after IFRS adoption and estimate the following regression (omitting subscripts):

$$Pr(ExtFin) = \alpha_0 + \alpha_1 IFRS + [firmcontrols] + e \quad (2)$$

[5] Although MICEX and the second stock exchange, RTS, merged in 2012, Datastream maintains values for their price indices separately. The MICEX and RTS price indices have a significant overlap in the constituents' lists but are analyzed nevertheless as standalone market performance indices by experts. MICEX has become the leading equity platform in Russia, and we omit analyses of RTS in this study.

In the above model, *ExtFin* is a dummy variable equal to one if a firm's equity-to-debt (E/D, total equity divided by total debt) ratio experienced positive changes after adoption of IFRS, and is zero otherwise. To compute the changes in the E/D ratio, we subtract the average E/D value for the pre-adoption years (2009 and 2010) from the average E/D value for the post-adoption years (2011 and 2012). *IFRS* is a dummy variable equal to one for IFRS adopters and is zero otherwise. The coefficient $\alpha_0[\alpha_0 + \alpha_1]$ indicates the probability of raising more equity, as opposed to debt, following the IFRS adoption reform for firms exempt from the IFRS adoption requirement [adopting IFRS]. These should be positive, to support *H2*. Consequently, the coefficient $\alpha_1$ measures the relative attractiveness of using equity financing, rather than debt financing, for IFRS adopters as opposed to non-adopters, and is expected to be positive to support *H3*. We control for firms' sizes (logarithm of total assets), growth opportunities (market-to-book value of equity), performances (earnings per share, or EPS), and industry affiliations, consistent with prior literature (Naranjo, Saavedra, & Verdi, 2017). These variables affect a firm's propensity to change its capital structure and are measured on the annual basis. All the variables are downloaded from Datastream in USD. The Model 2 is estimated using *Probit* with robust standard errors.

Our analyses are based on two pre-adoption years (2009 and 2010) and two post-adoption years (2011 and 2012), as noted previously. In Datastream, we identified 386 Russian public companies that had data available for estimating Model 2 across 2009-2012 time-period. We exclude 33 firms that are blue chips because they adopted IFRS and became subject to stringent regulations long before the above-mentioned capital market reforms in Russia began. These firms listed on the world's major stock exchanges, predominantly the London Stock Exchange, beginning in the 1990s and for them, the local IFRS adoption reform was of secondary importance as they already reported under IFRS prior to 2011 due to LSE's requirements. Next, of the remaining 353 public firms, 275 were exempt from the IFRS adoption requirement and 78 firms adopted IFRS. The law on Consolidated Financial Statements postulates that firms without subsidiaries and those not listed on the organized stock exchanges are not required to report under IFRS. That is, firms that are accepted for public trading at MICEX-RTS (or combined Moscow Exchange) but did not apply for listing do not have to prepare IFRS-based financials. The Russian law, nevertheless, recognizes both trading and listed companies as public firms. Both IFRS adopters and non-adopters were affected by changes in other regulations discussed above.

Finally, among 78 IFRS adopters, several firms were early voluntary adopters. Kim (2016a), however, reports that such firms prepared IFRS reports for internal purposes and did not fully comply with IFRS, until 2011 when these standards became officially required and when the stringent compliance mechanisms were introduced. In support, she finds that changes in reporting quality for these early adopters, indeed, occurred post mandatory adoption of IFRS (2011-2012).

## 4. EMPIRICAL ANALYSES

### 4.1. Market efficiency

Figure 1 plots the performance of the MICEX price index over the examined period of 1997-2016. The value of the index steadily grew, except for the six months between July 2008 and January 2009 when the global financial crisis hit the Russian economy. The price index achieved a pre-crisis level at the end of 2015. Figure 2 depicts the behavior of the MICEX return series, computed in accordance with Model 1. There was substantial volatility in the return series around the 1998 and 2008 financial crises. Nevertheless, the return series became less volatile over time, which we interpret as indirect evidence of the improved informational efficiency.

We continue the empirical examination of the market efficiency by implementing the serial correlation test that was at the heart of the earlier stream of literature (Fama, 1965). This test for weak-form efficiency only requires that price/return series are uncorrelated over time. Lo and MacKinlay (1988) introduced the variance ratio (VR) test which became pervasive in the literature. The premise of the VR test is that if the stock prices follow a random walk, then the variance of the n-period return is equal to n times the variance of the one-period return. More recently, the VR test was refined to include non-parametric test options and the possibility of conducting a joint test for multiple periods (Lim & Brooks, 2011).

We report the results of the Lo and MacKinlay (1988) VR test in Table 1. Panel A shows that the Russian stock market is not efficient, across the entire examined period of 1997-2016. In Panels B and C, we perform the VR test separately for the pre- and post-adoption periods. The value of the z-statistics declines in the post-adoption period, suggesting that the MICEX return series are less predictable in the post-adoption period. Further, we shorten the post-adoption period (Panels D-G) and report that the z-statistic declines. We conclude that the efficiency of the market improved over time. In unreported results, we document a similar improvement in market efficiency over time when the VR tests account for a possibility of exponential random walk and random walk with innovations.

The prior studies reported conflicting results regarding the market efficiency, using the serial correlation tests, even for the same stock markets (Lim & Brooks, 2011). For example, Liu, Song, and Romilly (1997) and Lima and Tabak (2004) examined the efficiency of the Shanghai and Shenzhen stock exchanges and did not find evidence of serial correlation in return series. Ma (2004), on the other hand, reported significant autocorrelation in return series for this stock market, rejecting the random walk. Squalli (2006) reported similar evidence for relatively immature stock markets, namely the Dubai Financial Market and the Abu Dhabi Securities Market. More recently, Kim (2017) documented that the Kazakhstani stock market was not informationally efficient. Alnodel (2015) reported no changes in the informational efficiency of the Saudi stock market before and after IFRS adoption.

Next, we perform the unit root test using the ADF test, to examine the stationarity of MICEX return series. As noted, this test has been favored in

the market efficiency literature and more, recently, it was refined to allow for a possibility of the structural break. As reported in Lean and Smyth (2007) in their study examining the Asian stock markets' efficiency, a structural break is often interpreted as a unit root, leading to under rejection of the null hypothesis.

We report the results of the ADF test with a possibility of a structural break in Table 2. In Panel A, the ADF t-statistic of -65.24616 is significantly less than any critical values, indicating that the Russian stock is not weak-form efficient. Next, there has been a significant change in the test statistic, from -57.3654 to -37.39892, in the post-adoption period, compared to the pre-adoption period. As we reduce the length of the post-adoption period (Panels D through G), the ADF test statistic becomes less negative and reaches -14.07532 in the most recent year 2016. The results of the ADF test without the structural break are consistent with those reported in Table 2. We conclude that the Russian stock market gradually becomes more efficient, and the results in Tables 1 and 2 support this claim.

### 4.2. Changes in firms' financing decisions around IFRS adoption

In the previous section, we discussed the details of the data collection process and noted that there are two categories of firms: IFRS adopters and non-adopters. We report the comparative descriptive statistics for the two samples of Russian public firms in Table 3, based on the entire examined period of 2009-2012. The non-adopters, RAS reporters, are smaller, priced higher, and report higher EPS and BVPS (book value per share), compared to IFRS reporters. This evidence suggests that potentially RAS reporters could have adopted IFRS since they demonstrate stronger performance than other IFRS reporters, but they chose not to do so. In addition, adopters and non-adopters hardly differ in terms of risk. Either RAS reporters consider little incremental benefit from adopting IFRS or they lack necessary resources to switch from the local standards to IFRS, given that they are smaller than their IFRS adopting peers. The descriptive analysis shows no difference in the capital structure for non-adopters compared to adopters. Table 3 results are not based on pre-post comparisons and we do not control for firm-level factors.

In Table 4, we report the results from estimating Model 2. The constant value of -0.12 is insignificant, indicating that non-adopters did not experience changes in the capital structure after IFRS adoption reform was implemented. These firms, nevertheless, were subject to other regulations, which suggests that changes in regulations alone are insufficient to improve the market's information environment to such an extent that there is a significant shift in firms' financing decisions. Next, the coefficient on the IFRS term is significantly positive at one percent or better. Consequently, IFRS adopters were more likely to raise equity rather than debt financing in the post-adoption period, unlike their RAS reporting peers. Overall, the results reported in Table 4 do not support the *H2* but support *H3*.

In summary, the above noted results indicate that the informational efficiency of the Russian stock market improved over time and there has been a shift in firms' financing decisions in favor of external sources, following IFRS adoption. Overall, the ambitious reforms started a decade ago by the Russian government have had a positive outcome. The results reported in this study reinforce the findings of earlier works (Kim, 2013a) that conducted an *ex ante* analysis of potential benefits to the Russian public firms from progressive changes in regulations and IFRS adoption.

### 4.3. Benefits of IFRS adoption and other regulatory reforms to the Russian economy

In his seminal work that examined potential pros and cons of global IFRS adoption, Ball (2006) predicted that this process would improve the cross-border flow of investment, the proposition empirically tested more recently. Prior studies documented that global convergence of accounting standards through adoption of IFRS, along with changes in other market regulations, is expected to decrease information processing costs, thus facilitating the inflow of FDIs into a national economy and increasing the scope of cross-border mergers and acquisitions (Amiram, 2012; Chen, Ding, & Xu, 2014). This provides strong incentives for emerging markets, such as Russia, to join the IFRS adoption pool.

In Table 5, we report the extent of Russia's reliance on foreign donors. The major organizations providing monetary assistance over the past two decades were the World Bank, the European Bank of Reconstruction and Development, and the IMF. Importantly, Russia has also heavily relied on the assistance of some nations including Germany, Japan, and the United States. During the period of 1991-2012, the total foreign aid accounted for about 1.51% of the gross domestic product (GDP) of Russia. Next, we examine structural changes in the volume of FDIs, as a fraction of GDP, prior to and after 2006 (pre- and post-reforms period, not limited by IFRS adoption timing). Notably, the relative annual FDIs are markedly different in the latter period, when the national government started implementation of important capital market initiatives, and account for 3.15% of the GDP, compared to 1.09% in the pre-reform period. Overall, it appears that the capital market reforms discussed above conferred significant benefits to the entire Russian economy. Combined, the evidence reported in this section provides strong initiatives to other emerging markets to adopt IFRS and implement other capital market reforms.

## 5. CONCLUSION

The recent capital market reforms implemented by the Russian government have attracted much attention, from both the critics and proponents. There were multiple changes in stock market regulations initiated and completed within a short time-frame, including revision in tax, shareholding, listing and governance regulations, the merger of the two major stock exchanges, as well as implementation of the IFRS adoption reform at a national level. The global investment community

generally favors such innovations, especially if they concern emerging markets such as Russia. The intent of these reforms was to improve the investor climate in the country by raising the level of reporting transparency and enhancing investor protection norms. The culmination of these reforms was adoption of IFRS in 2011, as experts noted. Undeniably, the Russian government remained committed to success and consistently implemented the changes in stock market regulations, even amidst the global financial crisis. Nevertheless, critics argued that when the reforms are conducted at a rapid pace with little supporting infrastructure, raising a valid concern over the effectiveness of their implementation, the benefits might never materialize.

Absent the empirical evidence, these concerns cannot be dismantled, and the present study attempts to shed the light on the true benefits of capital market reforms in Russia. We focus on the changes in the information environment of the Russian stock market and document improvement in market efficiency over time, particularly following adoption of IFRS. Next, we rely on the informational risk and pecking order theories to examine changes in firms' financing decisions around IFRS adoption. We find that IFRS adopters were more likely to raise finance via issuance of equity, rather than debt, instruments, unlike non-adopters. Finally, we report that the capital market reforms conferred significant benefits to the entire Russian economy and the inflow of FDIs experienced a threefold increase during the reform periods, compared to the pre-reform period. Overall, the evidence reported in this study provides strong grounds for other emerging nations to launch a course of Western-style capital market reforms. The results reported in the previous section are therefore of interest to the national governments, global investors, and accounting standard setters.

Our study is subject to several limitations. While we reported improvement in the informational efficiency of the Russian stock market over time, we were unable to assess the impact of individual reforms such as changes in taxation and transfer pricing regulations, formation of Moscow Exchange, etc. on market efficiency because those were bundled and their implementations overlapped. Rather, we interpreted the evidence of increase in FDIs as the outcome of implementation of multiple reforms. Second, the literature is not in agreement regarding the validity of different market efficiency tests, as conflicting results were reported for the same settings and time periods. To mitigate this concern, we relied on several tests both providing consistent findings. Further, Russia is a unique country with a strong command past and the findings of our study may have limited generalizability. In the future, we propose that long-term implications of IFRS adoption and other market reforms are assessed, when the data are more readily available and longer time periods can be examined. Our study, nevertheless, sets an important foundation for future research in emerging market regulations and the process of markets' integration.

## REFERENCES


1. Ahmed, K., Chalmers, K., & Khlif, H. (2013). A meta-analysis of IFRS adoption effects. *The International Journal of Accounting, 48*(2), 173-217. https://doi.org/10.1016/j.intacc.2013.04.002
2. Al-Khazali, O. M., Ding, D. K., & Pyun, C. S. (2007). A new variance ratio test of random walk in emerging markets: A revisit. *The Financial Review, 42*(2), 303-317. https://doi.org/10.1111/j.1540-6288.2007.00173.x
3. Alnodel, A. A. (2015). Does mandatory IFRS adoption improve market efficiency in emerging stock markets? Evidence from Saudi Arabia. *Global Review of Accounting and Finance, 6*(2), 1-15. https://doi.org/10.21102/graf.2015.09.62.01
4. Alon, A. (2013). Complexity and dual institutionality: The case of IFRS adoption in Russia. *Corporate Governance: An International Review, 21*(1), 42-57. https://doi.org/10.1111/j.1467-8683.2012.00927.x
5. Amiram, D. (2012). Financial information globalization and foreign investment decisions. *Journal of International Accounting Research, 11*(2), 57-81. https://doi.org/10.2308/jiar-50282
6. Armstrong, C. S., Barth, M. E., Jagolinzer, A. D., & Riedl, E. J. (2010). Market reaction to the adoption of IFRS in Europe. *The Accounting Review, 85*(1), 31-61. https://doi.org/10.2308/accr.2010.85.1.31
7. Arnold, P. J. (2005). Disciplining domestic regulation: The World Trade Organization and the market for professional services. *Accounting, Organizations and Society, 30*(4), 299–330. https://doi.org/10.1016/j.aos.2004.04.001
8. Ball, R. (2006). International Financial Reporting Standards (IFRS): Pros and cons for investors. *Accounting and Business Research, 36*(sup1), 5-27. https://doi.org/10.1080/00014788.2006.9730040
9. Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International accounting standards and accounting quality. *Journal of Accounting Research, 46*(3), 467-498. https://doi.org/10.1111/j.1475-679X.2008.00287.x
10. Barth, M. E., Landsman, W. R., Lang, M., & Williams, C. (2012). Are IFRS-based and US GAAP-based accounting amounts comparable? *Journal of Accounting and Economics, 54*(1), 68-93. https://doi.org/10.1016/j.jacceco.2012.03.001
11. Braendle, U. C., Omidvar, A., & Tehraninasr, A. (2013). On the specifics of corporate governance in Iran and the Middle East. *Corporate Ownership & Control, 10*(3), 49-62. https://doi.org/10.22495/cocv10i3art5
12. Campbell, J. Y., Lo, A. W., & MacKinlay, A. C. (1997). *The econometrics of financial markets.* https://doi.org/10.1515/9781400830213
13. Chakraborty, M. (2006). Market efficiency for the Pakistan stock market: Evidence from the Karachi Stock Exchange. *South Asia Economic Journal, 7*(1), 67-81. https://doi.org/10.1177/139156140500700104
14. Chen, C. J. P., Ding, Y., & Xu, B. (2014). Convergence of accounting standards and foreign direct investment. *The International Journal of Accounting, 49*(1), 53-86. https://doi.org/10.1016/j.intacc.2014.01.007
15. Chong, T. T.-L., Cheng, S. H.-S., & Wong, E. N.-Y. (2010). A comparison of stock market efficiency of the BRIC countries. *Technology and Investment, 1*(4), 235-238. https://doi.org/10.4236/ti.2010.14029
16. Christensen, H. B., Hail, L., & Leuz, C. (2013). Mandatory IFRS reporting and changes in enforcement. *Journal of Accounting and Economics, 56*(2-3), 147-177. https://doi.org/10.1016/j.jacceco.2013.10.007

17. Daniel, K., & Titman, S. (1999). Market efficiency in an irrational world. *Financial Analysts Journal, 55*(6), 28-40. https://doi.org/10.2469/faj.v55.n6.2312
18. Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research, 46*(5), 1085-1142. https://doi.org/10.1111/j.1475-679X.2008.00306.x
19. Daske, H., Hail, L., Leuz, C., & Verdi, R. (2013). Adopting a label: Heterogeneity in the economic consequences around IAS/IFRS adoptions. *Journal of Accounting Research, 51*(3), 495-547. https://doi.org/10.1111/1475-679X.12005
20. Fama, E. F. (1965). The behavior of stock-market prices. *The Journal of Business, 38*(1), 34-105. https://doi.org/10.1086/294743
21. Fama, E. F., & French, K. R. (2005). Financing decisions: Who issues stock? *Journal of Financial Economics, 76*(3), 549-582. https://doi.org/10.1016/j.jfineco.2004.10.003
22. Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics, 67*(2), 217-248. https://doi.org/10.1016/S0304-405X(02)00252-0
23. Graham, J. R., Leary, M. T., & Roberts, M. R. (2015). A century of capital structure: The leveraging of corporate America. *Journal of Financial Economics, 118*(3), 658-683. https://doi.org/10.1016/j.jfineco.2014.08.005
24. Grossman, S. J., & Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *The American Economic Review, 70*(4), 393-408. https://doi.org/10.7916/D8765R99
25. Hassan, M. K., & Chowdhury, S. S. H. (2008). Efficiency of Bangladesh stock market: Evidence from monthly index and individual firm data. *Applied Financial Economics, 18*(9), 749-758. https://doi.org/10.1080/09603100701320178
26. Helwege, J., & Liang, N. (1996). Is there a pecking order? Evidence from a panel of IPO firms. *Journal of Financial Economics, 40*(3), 429-458. https://doi.org/10.1016/0304-405X(95)00851-5
27. Hongcharu, B. (2006). Roles and responsibilities of board of directors: Paving new path toward corporate governance in Thailand. *Corporate Ownership & Control, 3*(4-1), 184-191. http://doi.org/10.22495/cocv3i4c1p4
28. Jithendranathan, T. (2006). An empirical study of pricing and trading volume of Russian depositary receipts. *Investment Management and Financial Innovations, 3*(3), 60-78. Retrieved from https://www.researchgate.net/publication/253604963_An_Empirical_Study_of_Pricing_and_Trading_Volume_of_Russian_Depositary_Receipts
29. Kalra, R., & Alexander, M. W. (2011). Corporate governance in emerging markets in Asia: Corporate managers' perspectives. *Corporate Ownership & Control, 8*(4-4), 411-419. http://doi.org/10.22495/cocv8i4c4art3
30. Karampinis, N. I., & Hevas, D. L. (2011). Mandating IFRS in an unfavorable environment: The Greek experience. *The International Journal of Accounting, 46*(3), 304-332. https://doi.org/10.1016/j.intacc.2011.07.001
31. Karemera, D, Ojah, K., & Cole, J. A. (1999). Random walks and market efficiency tests: Evidence from emerging equity markets. *Review of Quantitative Finance and Accounting, 13*(2), 171-188. https://doi.org/10.1023/A:1008399910942
32. Kim, O. (2013a). Russian accounting system: Value relevance of reported information and the IFRS adoption perspective. *The International Journal of Accounting, 48*(4), 525-547. https://doi.org/10.1016/j.intacc.2013.10.007
33. Kim, O. (2013b). The global recognition strategy of blue chips of the Russian and Commonwealth of Independent States (CIS) markets. *Journal of Contemporary Accounting & Economics, 9*(2), 151-169. https://doi.org/10.1016/j.jcae.2013.06.003
34. Kim, O. (2016a). The IFRS adoption reform through the lens of neo-institutionalism: The case of the Russian Federation. *The International Journal of Accounting, 51*(3), 345-362. https://doi.org/10.1016/j.intacc.2016.07.001
35. Kim, O. (2016b). Market efficiency and arbitrage opportunities for Russian depositary receipts cross-listed on the London Stock Exchange. *Review of Pacific Basin Financial Markets and Policies, 19*(2), 1-36. https://doi.org/10.1142/S0219091516500077
36. Kim, O. (2017). *The effects and implications of Kazakhstan's adoption of International Financial Reporting Standards. A resource dependence perspective*. Stuttgart, Germany: Ibidem.
37. King, N., Beattie, A., Cristescu, A.-M., & Weetman, P. (2001). Developing accounting and audit in a transition economy: The Romanian experience. *European Accounting Review, 10*(1), 149-171. https://doi.org/10.1080/09638180122711
38. Lean, H. H., & Smyth, R. (2007). Do Asian stock markets follow a random walk? Evidence from LM unit root tests with one and two structural breaks. *Review of Pacific Basin Financial Markets and Policies, 10*(1), 15-31. https://doi.org/10.1142/S0219091507000933
39. Leary, M. T., & Roberts, M. R. (2010). The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics, 95*(3), 332-355. https://doi.org/10.1016/j.jfineco.2009.10.009
40. Lim, K.-P., & Brooks, R. (2011). The evolution of stock market efficiency over time: A survey of the empirical literature. *Journal of Economic Surveys, 25*(1), 69-108. https://doi.org/10.1111/j.1467-6419.2009.00611.x
41. Lim, K.-P., & Brooks, R. D. (2006). *The evolving and relative efficiencies of stock markets: Empirical evidence from rolling bicorrelation test statistics.* https://doi.org/10.2139/ssrn.931071
42. Lima, E. J. A., & Tabak, B. M. (2004). Tests of the random walk hypothesis for equity markets: Evidence from China, Hong Kong and Singapore. *Applied Economics Letters, 11*(4), 255-258. https://doi.org/10.1080/13504850410001674911
43. Liu, X., Song, H., & Romilly, P. (1997). Are Chinese stock markets efficient? A cointegration and causality analysis. *Applied Economics Letters, 4*(8), 511-515. https://doi.org/10.1080/758536636
44. Lo, A. W, & MacKinlay, A. C. (1988). Stock market prices do not follow random walks: Evidence from a simple specification test. *The Review of Financial Studies, 1*(1), 41-66. https://doi.org/10.1093/rfs/1.1.41
45. Lo, A. W. (2004). The adaptive markets hypothesis: Market efficiency from an evolutionary perspective. *The Journal of Portfolio Management, 30*(5), 15-29. https://doi.org/10.3905/jpm.2004.442611
46. Lo, A. W. (2005) Reconciling efficient markets with behavioral finance: The adaptive markets hypothesis. *Journal of Investment Consulting, 7*(2), 21-44. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1702447

47. Ma, S. (2004). *The efficiency of China's stock market*. Aldershot, the UK: Ashgate.
48. Melloni, N. (2006). *Market without economy. The 1998 Russian financial crisis*. Stuttgart, Germany: Ibidem.
49. Mir, M. Z., & Rahaman, A. S. (2005). The adoption of international accounting standards in Bangladesh: An exploration of rationale and process. *Accounting, Auditing & Accountability Journal, 18*(6), 816-841. https://doi.org/10.1108/09513570510627720
50. Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance, 39*(3), 574-592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x
51. Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187-221. https://doi.org/10.1016/0304-405X(84)90023-0
52. Naranjo, P., Saavedra, D., & Verdi, R. S. (2017). *Financial reporting regulation and financing decisions.* Retrieved from https://www.hbs.edu/faculty/conferences/2017-imo/Documents/Rodrigo_nsvcapstruc04052017.pdf
53. Ozdemir, Z. A. (2008). Efficient market hypothesis: Evidence from a small open-economy. *Applied Economics, 40*(5), 633-641. https://doi.org/10.1080/00036840600722315
54. Self, J. K., & Mathur, I. (2006) Asymmetric stationarity in national stock market indices: An MTAR analysis. *The Journal of Business, 79*(6), 3153-3174. https://doi.org/10.1086/505252
55. Shyam-Sunder, L., & Myers, S. C. (1999). Testing static tradeoff against pecking order models of capital structure1. *Journal of Financial Economics, 51*(2), 219-244. https://doi.org/10.1016/S0304-405X(98)00051-8
56. Smith, G. (2009). Martingales in European emerging stock markets: Size, liquidity and market quality. *The European Journal of Finance, 15*(3), 249-262. https://doi.org/10.1080/13518470802423262
57. Squalli, J. (2006). A non-parametric assessment of weak-form efficiency in the UAE financial markets. *Applied Financial Economics, 16*(18), 1365-1373. https://doi.org/10.1080/09603100500447594
58. State Street Global Advisors. (2015). *State Street Global Advisors report*.
59. Uddin, S., & Tsamenyi, M. (2005). Public sector reforms and the public interest: A case study of accounting control changes and performance monitoring in a Ghanaian state-owned enterprise. *Accounting, Auditing and Accountability Journal*, 18(5), 648–674. https://doi.org/10.1108/09513570510620493
60. Weetman, P. (2006). Discovering the 'international' in accounting and finance. *The British Accounting Review, 38*(4), 351-370. https://doi.org/10.1016/j.bar.2006.09.001

## APPENDIX

**Figure 1.** MICEX price index historic performance (monthly)

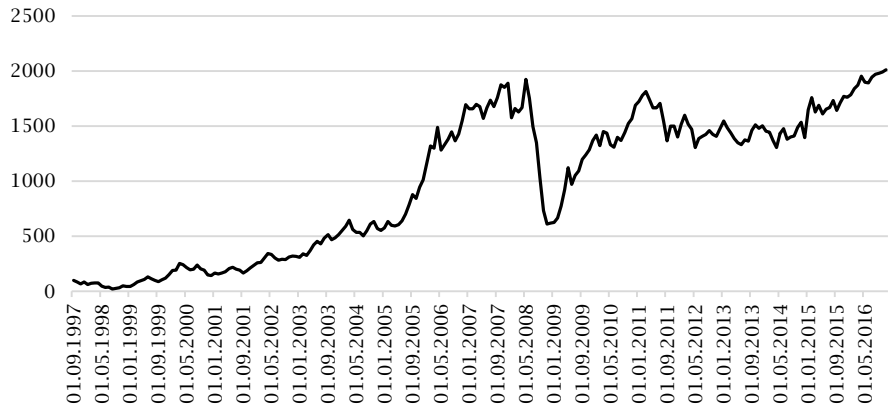


**Figure 2.** MICEX returns historic performance (monthly)

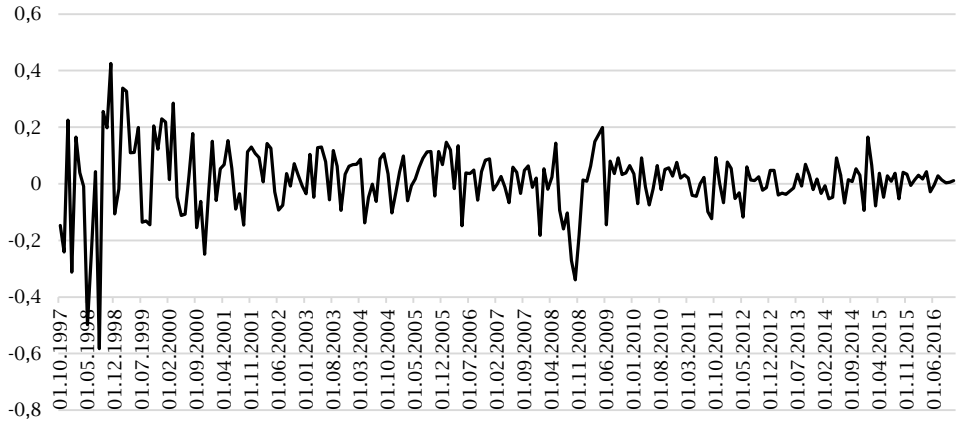


**Table 1.** Testing the Russian market efficiency: Lo and MacKinlay (1988) variance ratio (VR) test

| ***Panel A. The entire examined period (1997-2016)*** | | |
|---|---|---|
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 11.09579 | 0.0000 |
| ***Panel B. Pre-IFRS adoption (1997-2011)*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 10.42795 | 0.0000 |
| ***Panel C. Post-IFRS adoption period (2012-2016)*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 7.57455 | 0.0000 |
| ***Panel D. Excluding 2012 from the post-adoption period*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 6.182682 | 0.0000 |
| ***Panel E. Excluding 2012-2013 from the post-adoption period*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 5.255668 | 0.0000 |
| ***Panel F. Excluding 2012-2014 from the post-adoption period*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 7.533539 | 0.0000 |
| ***Panel G. Excluding 2012-2015 from the post-adoption period*** | | |
| ***Joint tests*** | ***Value*** | ***Probability*** |
| Max \|z\| (at period 2)* | 4.516066 | 0.0000 |

*Notes: The table reports the results of the variance ratio (VR) test using the methodology in Lo and MacKinlay (1988). The examined MICEX return series were computed in accordance with Model 1 and the examination period is between September 1997 and November 2016 (No. obs. = 4,992). Next, to examine the changes in market efficiency over time, we break down this sample into the pre-IFRS adoption period (September 22, 1997 – December 31, 2011) and post-IFRS adoption period (January 1, 2012 – November 9, 2016). Further, we reduce the post-adoption period, to examine changes in market efficiency over time (Panel D-G).*

**Table 2.** Testing the Russian stock market efficiency: Augmented Dickey-Fuller (ADF) test

| | | | |
|---|---|---|---|
| ***Panel A. The entire period (1997-2016)*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -65.24616 | < 0.01 |
| Test critical values: | 1% level | -4.949133 | |
| | 5% level | -4.443649 | |
| | 10% level | -4.193627 | |
| ***Panel B. Pre-IFRS adoption (1997-2011)*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -57.3654 | < 0.01 |
| Test critical values: | As in Panel A | | |
| ***Panel C. Post-IFRS adoption period (2012-2016)*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -37.39892 | < 0.01 |
| Test critical values: | As in Panel A | | |
| ***Panel D. Excluding 2012 from the post-adoption period*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -33.5139 | < 0.01 |
| Test critical values: | As in Panel A | | |
| ***Panel E. Excluding 2012-2013 from the post-adoption period*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -29.35776 | < 0.01 |
| Test critical values: | As in Panel A | | |
| ***Panel F. Excluding 2012-2014 from the post-adoption period*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -22.43666 | < 0.01 |
| Test critical values: | As in Panel A | | |
| ***Panel G. Excluding 2012-2015 from the post-adoption period*** | | | |
| | | ***t-statistic*** | ***Prob.**** |
| Augmented Dickey-Fuller test statistic | | -14.07532 | < 0.01 |
| Test critical values: | As in Panel A | | |

*Notes: The table reports the results of the ADF test. The null hypothesis is that the examined series have a unit root (non-stationary) and therefore follow random walk. The outcome of the test is assessed against critical MacKinnon (1996) one-sided values. The examined MICEX return series were computed in accordance with Model 1 and the examination period is between September 1997 and November 2016 (No. obs. = 4,992). Next, to examine the changes in market efficiency over time, we break down this sample into the pre-IFRS adoption period (September 22, 1997 – December 31, 2011) and post-IFRS adoption period (January 1, 2012 – November 9, 2016). Further, we reduce the post-adoption period, to examine changes in market efficiency over time (Panel D-G).*

**Table 3.** Comparative descriptive statistics for IFRS adopters (78 firms) and non-adopters (275 firms)

| ***Variable*** | ***No. of firm-year obs.*** | ***Non-adopters v. Adopters*** |
|---|---|---|
| *Price* | 1,412 | -16.79*** |
| | | -1.96*** |
| *EPS* | 1,412 | -1.64*** |
| | | -0.06*** |
| *BVPS* | 1,412 | -17.24*** |
| | | -2.21*** |
| *Size* | 1,412 | 2.41*** |
| | | 2.49*** |
| *MB* | 1,412 | -11.17 |
| | | 0.1* |
| *Lev* | 1,412 | -2.77 |
| | | -0.22 |
| *NoSh* | 1,412 | 7,7633,299*** |
| | | 981,848*** |

*Notes: The table reports a pairs-based comparison for the main variables of the study (mean and then median values) for IFRS non-adopters (275 firms) versus IFRS adopters (78 firms). Variables definitions: Price = price per share; EPS = earnings per share; BVPS = book value per share; Size = natural logarithm of total assets; Lev = total liabilities divided by common shareholders' equity; NoSh = number of shares of common stock outstanding (in thousands). The *, **, and *** indicate significance at 10, 5 and 1 percent levels, respectively. Examined period: 2009-2012. Pairs-based comparison. The value for the first sample is subtracted from the value for the second sample.*

**Table 4.** Changes in firms' financing decisions around IFRS adoption

| $Pr(ExtFin) = \alpha_0 + \alpha_1 IFRS + [firmcontrols] + e_{it}$ | | | | |
|---|---|---|---|---|
| ***Variable*** | ***Constant*** | ***IFRS*** | ***Firm Controls*** | ***Industry*** |
| | -0.12 | 0.57*** | Included | Included |
| R-Sq. | 0.035 | | | |
| No. firms | 353 | | | |

*Notes: The table reports the results of estimating Model 2. In the model below, ExtFin is a dummy variable equal to one if a firm's equity-to-debt (E/D, total equity divided by total debt) ratio experienced positive changes after adoption of IFRS, and is zero otherwise. To compute the changes in the E/D ratio, we subtract the average E/D value for the pre-adoption years (2009 and 2010) from the average E/D value for the post-adoption years (2011 and 2012). IFRS is a dummy variable equal to one for IFRS adopters and is zero otherwise. There are 353 non-adopters and 78 IFRS adopters for which the E/D ratio was computed. We control for firms' size (logarithm of total assets), growth opportunities (market-to-book value of equity), performance (earnings per share, or EPS), and industry affiliation. These variables are expected to affect a firm's propensity to change its capital structure and are measured on the annual basis. All the variables are downloaded from Datastream in USD. The Model 2 is estimated using Probit with robust standard errors. The *, **, and *** indicate significance at 10, 5 and 1 percent levels, respectively.*

**Table 5.** Benefits to the Russian economy as a whole as a result of IFRS adoption and other regulatory reforms

| ***Donor Commitment, USD, 1991-2012*** | ***Russia*** |
|---|---|
| Germany | 27,306,924,266 |
| World Bank - International Bank for Reconstruction and Development (IBRD) | 19,418,780,327 |
| European Bank for Reconstruction & Development (EBRD) | 20,513,453,283 |
| International Monetary Fund (IMF) | 23,588,169,391 |
| United States | 9,934,360,142 |
| Japan | 2,456,735,783 |
| World Bank - International Finance Corporation (IFC) | 2,075,257,174 |
| European Communities (EC) | 1,760,072,813 |
| United Kingdom | 756,191,407 |
| Global Fund to Fight Aids, Tuberculosis and Malaria (GFATM) | 369,282,233 |
| Global Environment Facility (GEF) | 298,277,324 |
| France | 242,179,146 |
| Sweden | 316,316,918 |
| Canada | 5,873,718 |
| Portugal | 256,503,390 |
| Islamic Development Bank (ISDB) | 8,215,373 |
| World Bank - Carbon Finance Unit | 154,746,949 |
| Belgium | 141,285,201 |
| Spain | 30,071,134 |
| Switzerland | 126,092,943 |
| Finland | 96,075,726 |
| Norway | 61,601,567 |
| Netherlands | 57,987,281 |
| Austria | 68,454,409 |
| United Nations Children s Fund (UNICEF) | 3,685,414 |
| Italy | 11,175,707 |
| United Nations Development Programme (UNDP) | 1,307,480 |
| United Nations Population Fund (UNFPA) | 2,088,245 |
| Greece | 5,873,718 |
| Joint United Nations Programme on HIV/AIDS (UNAIDS) | 4,203,278 |
| Czech Republic | 1,314,444 |
| Liechtenstein | 1,918,590 |
| United Nations Democracy Fund (UNDEF) | 927,522 |
| Luxembourg | 8,513,908 |
| Ireland | 75,594,502 |
| Australia | 1,446 |
| Lithuania | 464,466 |
| Estonia | 1,446 |
| Hungary | 2,579 |
| Monaco | 79,086 |
| Slovenia | 26,241 |
| **Total foreign aid** | **110,160,085,970** |
| Total GDP, billion USD, 1991-2012 | 16,156.7 |
| **Total foreign aid as a fraction of GDP** | **0.68%** |
| ***FDIs by period:*** | |
| Foreign direct investment, annual net inflows (% of GDP), average for the 1991-2005 period | **1.09%** |
| Foreign direct investment, annual net inflows (% of GDP), average for the 2006-2014 period | **3.15%** |

*Notes: The table reports the international donors' aid issued to Russia over the period of 1991-2012 (USD constant prices) and the relative FDIs in two periods: 1991-2005 and 2006-2014.*

*Source: World Economic Outlook (2015), World Development Indicators (2015), USAID (2015).*