

**Market Reaction to Information Technology Investment
Announcements in Russian Firms**

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Market Reaction to Information Technology Investment Announcements in Russian Firms

Completed Research Paper

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Abstract

This study examines the stock market reaction to announcements of information technology (IT) investments by Russian firms. While several similar studies have been published in the context of highly developed economies like the USA, very few such studies have been conducted in transition economies, and perhaps none previously in Russia. Based on 91 announcements between 2009 and 2012, three research hypotheses are tested. Similar to the results reported in previous studies from other countries, industry sector of the company making the IT investment has little effect on the market reaction. Also similar to the results reported from the USA, the Russian stock market seems to respond more positively to innovative IT investments than to non-innovative investments. However, in contrast to the results reported in a study conducted in Poland, where IT investments through global vendors seem to be perceived more positively than investments through local vendors, in Russia investments through global vendor are received negatively by the stock market.

Keywords

Event study, information technology investments, Russia, transition economies

Introduction

Though the business activities of modern enterprises are highly dependent on information technology (IT), investments in new IT are expensive and must compete for limited financial, material and human resources. Thus the issues of effectiveness and economic pay-off of IT investments are of primary concern. Since a basic postulate of modern investments and financial management is a company's value maximization for investors and other stakeholders, any investments should be value-oriented. That is, the investments should be directed toward reaching economic goals set by the major stakeholders of the company, and the return on the invested capital must meet expectations of the stakeholders and be appropriate for the level of risk involved.

It is generally recognized that investments in IT may help or even be required to maintain or increase the competitiveness of a company. Competitive advantage occurs by providing consumers with more value for the same price (differentiation strategy) or providing equal value at a lower cost (cost leadership strategy) (Porter 1980). However, IT investments may not always be effective and value growth generating (Kohli, Sherer and Baron 2003). One way of measuring IT investment performance is looking at the market reaction to such investment announcements of publicly traded companies. Though the first such event studies of market reaction to IT investment announcements by companies in highly developed economies were published more than twenty years ago (Dos Santos, Peffer and Mauer 1993), in the context of transition economies and emerging markets such studies are still extremely rare. Emerging markets or countries are countries with low absolute, but fast growing per capita income and with administrations dedicated to economic liberalization. The term transition economy refers to a country that recently transformed or is in the process of transforming from a centrally planned economy to a market driven system (Roztock and Weistroffer 2008, 2011b). Most transition economies also qualify as emerging markets (Roztock and Weistroffer 2009a).

Perhaps the first event study conducted in the context of a transition economy (Dobija, Klimczak, Roztocki and Weistroffer 2012) investigated the impact of IT investment announcements on the Warsaw Stock Exchange in Poland. Subsequent studies by Delina, Packova, Roztocki and Weistroffer (2013) and by Janke and Packova (2013) looked at market reaction using stock market data from Czech Republic, Hungary and Slovakia. For Russian companies, such studies are still in their very early stages.

Thus, the objective of this study is to further expand the repository of event studies within the field of information system research and investigate how the stock market in transition economies, and specifically in Russia, reacts to IT investment announcements as compared to the USA.

Market Dynamics of IT Investments in Russia

The market value of publicly traded companies may be one of the most important indicators of their business success. If company shares are in high demand, it is easier for that company to raise capital. Thus looking at stock market reaction to IT investment announcements may be a useful way to measure performance of IT investments.. For the purpose of our study, we define IT investments as “any large, non-routine expenses for implementing new technology or aimed at making better use out of existing technology” (Roztocki and Weistroffer 2009b).

After the 2008-2009 financial crisis, the global IT market has been recovering gradually, and by 2010 it had reached its pre-crisis level. In 2011, it finally recovered from the recession and increased in relation both to the previous year and to pre-crisis levels. However, it is worth noting that 2011 was a peak in the IT market recovery from the recession, with lower growth in 2012 and 2013. Figure 1 shows the dynamics of the global IT market as seen by leading agencies such as Gartner, Forrester and IDC.

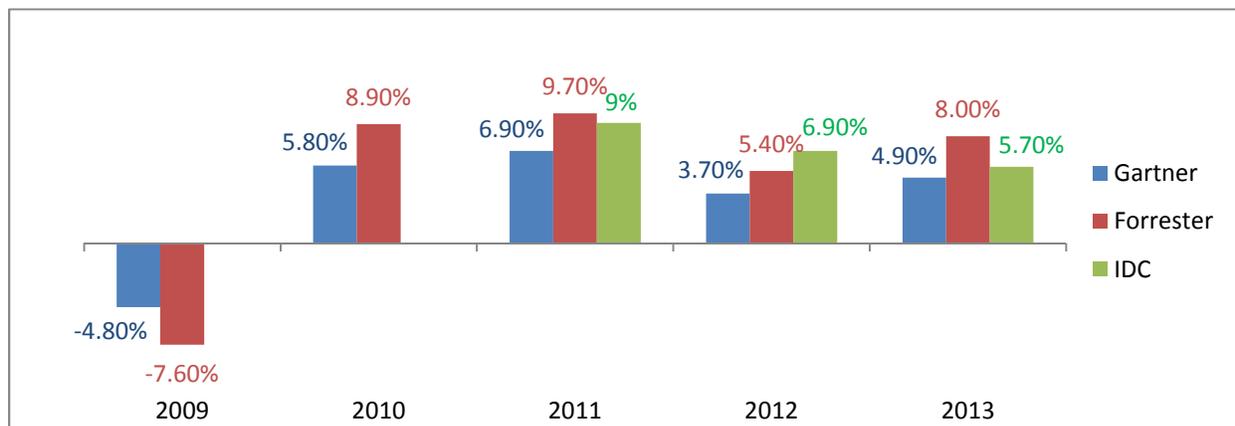


Figure 1. Dynamics of the Global IT-Market, 2009-2013 (Tadviser 2013)

In April 2012, the World Economic Forum published a ranking of countries on the development of IT in 2010-2011 (GT 2013), with Russia ranked at 38. The IT market in Russia has been demonstrating high rates of growth, but it is still far from saturation. Despite impressive post-crisis growth rates, absolute figures are still quite modest. Thus, the contribution of IT spending to GDP is 1.2 %, while for the developed countries it has reached 4.3 % (CNews 2012) According to PMR (2013) the Russian IT market reached its pre-crisis level in 2011 – 584.4 billion rubles or €14.3 billion, versus. €14.1 billion in 2008. Although the Russian market has shown steady growth, this growth has slowed down in recent years with only 3.9 % growth in 2012 (CNews 2012), the lowest rate of growth of the market over the past ten years, except for the crisis years 2008–2009. According to IDC (2012), in the next 5 years the Russian IT market should grow only 5-7% a year, so its performance would be on par with the world market (Figure 2).

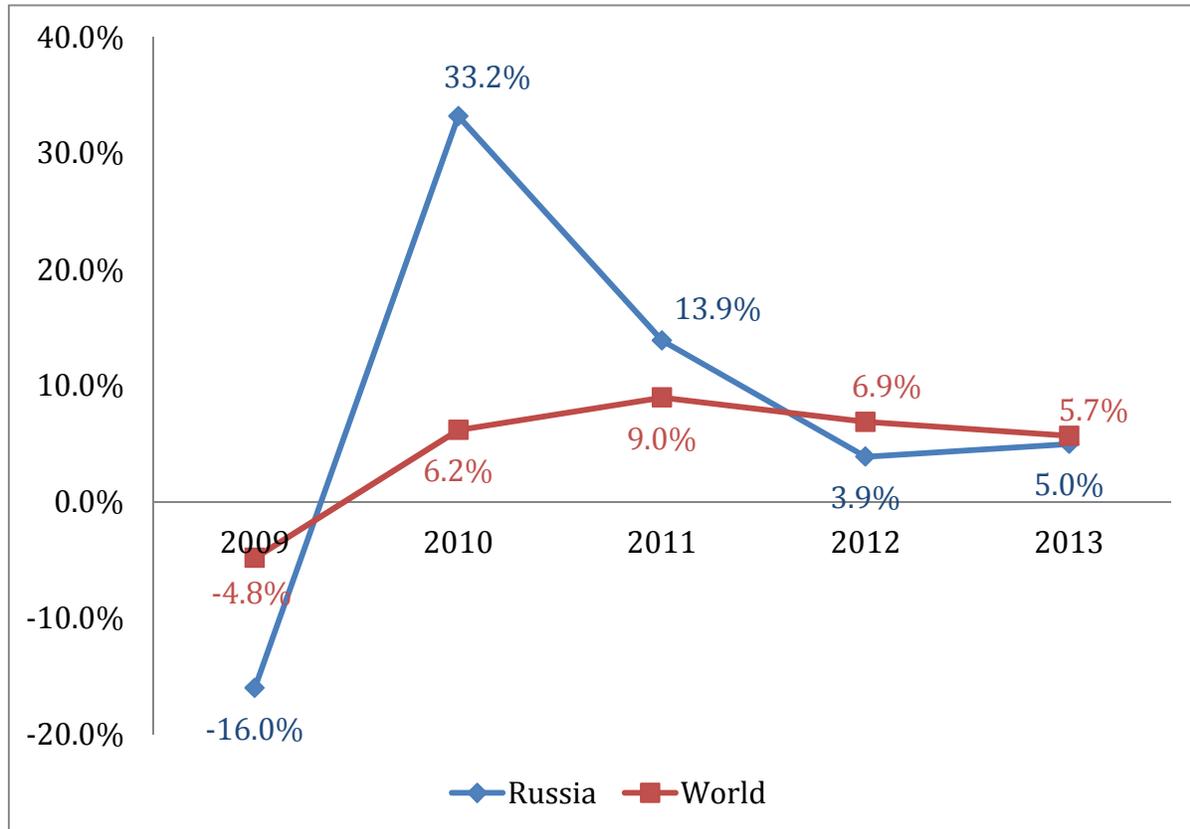


Figure 2. Rate of Growth of the Russian Market as Compared to the Global Average Rate, 2009-2013 (CNews 2012)

The leaders in the consumption of IT-services in Russia include banks and insurance companies (22%), the public sector (20%) and the telecommunications sector (13%) (CNews 2012). The intensity of investments in the Russian IT companies (measured as the share of the IT budget in revenues) is several times lower than that of the foreign companies (Table 1).

Sector	Russian companies (%)	Foreign companies ¹ (%)
Banks and financial companies	1.4	6.9
Insurance and financial services	1.2	3.5
Retail	0.7	2.3
Machinery	0.7	2.5
Metal processing	0.4	2.7
Chemicals	0.4	2.4
Professional services	0.7	3.5
Telecommunications	2.3	8.7
Energy processing and distribution	1	2.5
Oil and gas extracting	1.6	4.5
Construction	0.6	2.1
Food processing	0.3	No data

Table 1. Industry Sector

¹ The average indicator

Research Methodology and Hypotheses

The methodology used in the work reported in this paper is event study analysis. Foundational work on event study analysis goes back to the late 1960s. Ball and Brown (1968) looked at the market response to announcements about companies' financial results. Fama, Fisher, Jensen, and Roll (1969) investigated market reaction to information on company stock splitting. The methodology used in many of the current event studies is basically the same as the methodology introduced in these early works. Based on the notion of an efficient market that will respond immediately to any consequential events, the objective of event study analysis is to assess the impact of specific events or happenings on company performance through the market reaction to these events. If an event is perceived to have a positive impact on company performance, the stock price for that company will go up, and if the event is perceived to have a negative impact on company performance, the stock price will go down. In Russia, event study analysis has been used to investigate dividend policies (Teplova 2008), and capitalization (Ivashkovskaya, Shamraeva and Grigoriadi 2009; Okulov 2010).

Based in part on the work of Dos Santos et al. (1993) who investigated market reaction to IT investment announcements in the USA, a highly developed economy, and on the work of Dobija et al. (2012) who published perhaps the first study on stock market reaction to IT investment announcements in a transition economy based on data from the Warsaw Stock Exchange in Poland, we investigate the market reaction to IT investment announcements in Russia, using a similar approach to these previous studies in order to ensure comparability of results.

Event study analysis as described by McKinlay (1997) consists of four steps. The first step is the determination of the type of event to be investigated and the specification of the event window and the estimation period. In our study, an event is the announcement of an IT investment by a company. The event window is the period of time in which the stock price reaction is observed. The most commonly used event window is 3 days: the day before the event, the day of the event, and the day after the event. The reason the day before the event, i.e. before the official announcement, is included is that often companies provide information on IT investments in advance of the official release. The present study also uses this 3-day event window. The estimation period is the time interval preceding the event and used for estimating the expected market return in the absence of unforeseen events. Common estimation periods range from 100 to 300 days. Based on previous publications, an estimation period of 200 days is used in the current study.

The second step in event study analysis is identification of the events, that is, in our study the identification of announcements of IT investments by publically traded companies in Russia. We used the Emerging Markets Information Service (EMIS) database for this purpose, limiting our study to announcements in the period 2009 - 2012. We included announcements of investments in IT-equipment, software, as well as services. We initially identified 436 announcements, from which we then excluded companies not traded on the stock market and those companies for which we could not get information on daily share prices. As a result, our sample was reduced to 100 announcements. After examining the announcements in detail and removing duplicate announcements and announcements that were not first announcements of the investment, we ended up with a sample of 91 announcements of large public companies (see Appendix 1). Distribution of the announcements by year and industry sector is shown in Table 2.

Year	Financial Sector	Industrial Sector	Services	Total
2009	2	4	0	6
2010	2	25	2	29
2011	11	16	11	38
2012	7	0	11	18
Total	22	45	24	91

Table 2. Distribution of Announcements by Year and Industry Sector

As shown in previous event studies of IT investment announcements, the market reaction to the announcements may depend on several factors, such as the sector of economy in which the IT investment was made, the type of IT investment, and the of vendor involved in the investment. For example, it may be reasonable to assume that the financial sector is more sensitive to IT investments, than the industrial sector. Separating the announcements by

industrial sectors allows us to test for differences in market reaction to these types of investments. Figure 3 visualizes the distribution of the announcements in our sample by industry sector.

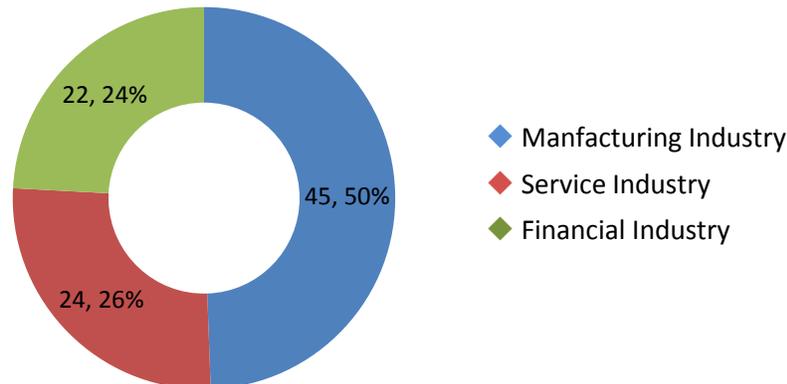


Figure 3. Distribution of Announcements by Industry Sector

Similarly, we may divide the announcements into those that relate to an investment of IT for innovation purposes, and those that aim at improving efficiency rather than innovation. We term the latter type adaptive technology investments, and Figure 4 shows the distribution of our sample announcements between innovative technology investments, adaptive technology investments, and those that we were unable to classify along those lines.

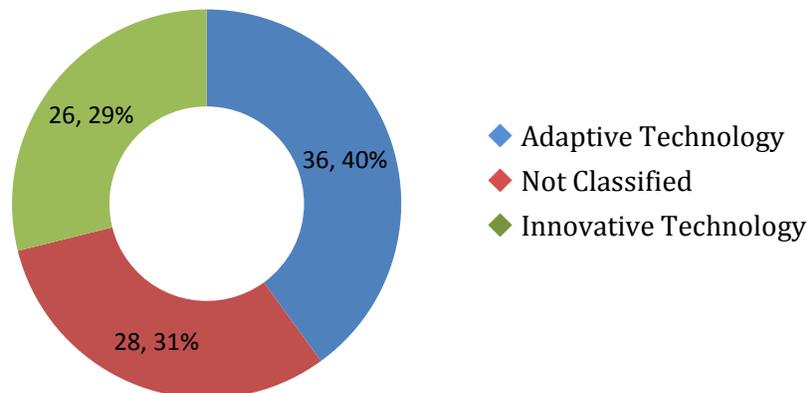


Figure 4. Distribution of Announcements by Investment Type (Innovative or Adaptive)

In developed economies, major services providers (vendors) seem more attractive to market participants than small local vendors (Hayes, Hunton and Reck 2001; Ranganathan and Brown 2006). In emerging markets, small local suppliers of IT may be preferred because they are expected to be more knowledgeable about the local business environment than international companies. Particularly in Russia, IT market needs are different from global markets because of language and legal requirements creating barriers for international participants. However, local providers may lack sufficient resources, so that global vendors may still be preferred as being safer. To test this, we group our IT investment announcements based on the providers of the IT investments. Figure 5 shows the distribution of the IT investment announcements in our sample among four groups: local vendors, global vendors, local subsidiaries of global vendors, and company internal IT departments.

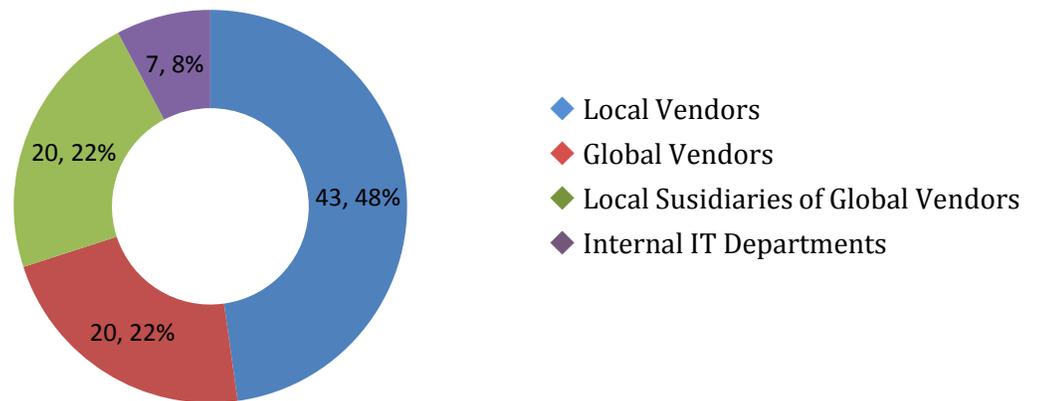


Figure 5. Distribution of Announcements by Type of IT-vendors

Based on previously published event studies on IT investment announcements and in accordance with the various classifications of our announcements as shown in Figures 3, 4, and 5, we established a set of research hypotheses. According to Roztocki and Weistroffer (2011a), industry sector was found to have little or no influence in previous event studies that investigated this factor in the context of mature economies. But to test if this may be different in Russia, we hypothesize:

H1: The market reacts differently to IT investments from companies in different industries.

Dos Santos et al. (1993) in their event study found that for announcements of innovative technology investments the stock market reacted positively but found no significant reaction for non-innovative investments. Using data from Australia, Ferguson, Finn and Hall (2005) compared stock market reaction of innovative and non-innovative e-commerce initiatives. Non-innovative e-commerce investments were received in Australia more favorably than innovative ones. To compare stock market reaction in the context of Russia with these earlier results, we propose the following two hypotheses:

H2a: The market reacts positively to innovative IT investments.

H2b: There is no abnormal market return from adaptive IT investments.

Vendor characteristics were found to be an influential factor in some previous event studies, where investments through large vendors were received more favorably than investments through small vendors (Hayes et al. 2001). Dobija et al. (2012) compared stock market reaction to investments using global vendors to those using local Polish vendors. The stock market reaction for global vendors was significant and positive. Thus, we establish the following hypothesis:

H3: The market reacts more positively to IT investment announcements when the investment is done through a major global vendor rather than a local vendor.

To assess the market reaction to IT investment announcements and test our hypotheses we look at the abnormal or excess returns of the investigated stock, which is calculated as the difference between the actual return and the estimated expected return, based on the stock performance during the estimation period:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

where AR_{it} denotes the abnormal return on the security i at day t ; R_{mt} denotes the expected market return at day t ; α_i and β_i are estimation parameters for the expected return calculated based on the estimation period; and R_{it} denotes the actual return on the security i at day t , based on the closing prices of the shares on the Moscow MICEX stock exchange.

To standardize AR we can divide it by its standard deviation (Henderson 1990; Peterson 1989), giving us the standardized abnormal return (SAR) for company i on day t as follows:

$$SAR_{it} = \frac{AR_{it}}{SD_{it}}$$

where

$$SD_{it} = \sqrt{S_i^2 \times \left(1 + \frac{1}{T} + \frac{(R_{mt} - R_m)^2}{\sum_{t=1}^T (R_{mt} - R_m)^2}\right)}$$

and S_i is the standard deviation of residual returns for company i as calculated from the market model (Dodd and Warner 1983). R_m is the arithmetic mean of all market returns during the estimation period and T is the number of days in the estimation period.

Cumulative abnormal returns (CAR) can be calculated by summing the AR for the days of the event window. To assess the stock price reaction for significance, cumulative standardized abnormal returns (CSAR) are calculated for a particular event window as:

$$CSAR_i = \sum_{t=t_1}^{t_2} \frac{SAR_{it}}{\sqrt{t_2 - t_1 + 1}}$$

where t_1 is the first day of the event period and t_2 is the last day of the event period. The stock price reaction can further be tested for significance using:

$$Z = \frac{\sum_{i=1}^N CSAR_i}{\sqrt{N}}$$

where N is the number of investment announcements included in the sample or subsample. A value for Z close to zero would indicate that the observed results are not significant, i.e. that the observed “abnormal” returns may be due to chance variation.

Research Results

Table 3 shows the cumulative standardized abnormal returns for the total sample as well as by industrial sectors, together with the Z values.

	CSAR	Z value
The total sample of announcements (91)	-0.13	-0.69
Manufacturing sector (45)	-0.24	-0.91
Financial sector (22)	-0.26	-0.69
Services (24)	0.05	0.14

Table 3. Results by Industry Sector

The Z -values in Table 3 show that none of the results are statistically significant. There is no significant difference in the stock market reaction to IT investment announcements by industry sector, and hypothesis H1 must be rejected.

Table 4 shows the cumulative standardized abnormal returns for innovative and adaptive IT investments. Only the results for innovative technology are statistically significant. There is a positive market reaction to innovative IT investments. Thus hypothesis H2 is accepted.

	CSAR	Z-value
Innovative technology (26)	0.89	2.43*
Adaptive technology (36)	0.26	-0.81
Non-classified technology (28)	-0.98	-2.76

* significant at 5% level

Table 4. Results by Type of Technology

Table 5 shows the results for the different types of vendors.

	CSAR	Z-value
Global vendor (20)	-0.94	-1.74*
Domestic vendor (43)	0.28	-0.90
Local subsidiary of global vendor (20)	-0.18	-0.44
Internal IT-department (7)	-0.01	-0.01

* significant at 5% level

Table 5. Results by Type of Vendor

Only the results for global vendors are statistically significant: the market reacts negatively to IT investments by global vendors. This is different from what we expected in hypothesis H3.

The results are summarized in Table 6.

Hypothesis	Supported	Comments
1	Rejected	There is no significant difference in stock price reaction based on the industry sector of the investing company
2a	Accepted	The market reacts positively to innovative IT investments
2b	Accepted	There is no significant stock price reaction for adaptive IT investments
3	Rejected	The market reacts negatively to investments from global vendors

Table 6. Overview of the Results

Conclusions

The most surprising result of our analysis is the negative stock price reaction for global vendors. This is different from the results in the study conducted by Dobija et al. (2012). It is quite possible that our earlier supposition, that global vendors lack knowledge about the local business environment holds and thus causes this negative reaction, as IT market needs in Russia differ from global markets due to language and legal requirements. On the other hand, the lack of a significant market reaction to local vendors' announcements may be explained both with relatively small size of most of these investments and the lack of resources of these vendors. This may be an interesting issue for further investigation.

We believe that our study makes a significant contribution to the repository of event studies in IS research, in that it is probably the first event study published in English and looking at IT investments in Russia, and one of only very few such studies in transition economies in general. We anticipate that our research provides a robust basis for further event studies looking at IT investments outside of the highly developed economies like the USA and Western Europe. For example, a future study may extend the scope of the investigation to other Commonwealth of Independent States countries. Another research opportunity is to conduct a comparative event study that directly compares stock market reaction to IT investments in Russia to stock market reaction in the USA, or other developed economies. All these future projects will expand our knowledge on IT in transition economies, where research still is very limited in quantity and scope (Roztocki and Weistroffer 2014).

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Appendix 1. Lists of Announcements

Company	Industry	Announcement Date	Vendor
MGTS	Services	06.11.2012	Business logic 2.0
MGTS	Services	02.11.2012	Business logic 2.0
FSK-EES	Services	02.11.2012	Navigation Information Systems
Rostelecom	Services	24.10.2012	Nokia Siemens Networks
Rostelecom	Services	20.09.2012	Amdocs
MGTS	Services	15.06.2012	IT department
Rostelecom	Services	19.09.2011	Microsoft
Aeroflot	Services	11.08.2011	Software AG & IDS Scheer
MTS	Services	06.06.2011	Comarch
MTS	Services	11.09.2012	Sitronics IT
Rostelecom	Services	30.08.2012	AT Consulting
MOESC	Services	14.06.2012	Energodata
MOESC	Services	23.03.2012	Energodata
MTS	Services	07.03.2012	Evolving Systems
MOESC	Services	26.12.2011	Energodata
MTS	Services	24.10.2011	ABBYY
MTS	Services	15.09.2011	Plus One
MTS	Services	01.08.2011	Sitronics IT
Dixy	Services	07.07.2011	Xerox
Rostelecom	Services	02.06.2011	EGAR Technology
Magnit	Services	30.03.2011	Softex
MGTS	Services	31.03.2011	Sitronics IT
MTS	Services	21.10.2010	Sitronics IT
Transneft	Services	01.10.2010	Energodatacontrol

Table A1. Services Sector Announcements

Company	Industry	Announcement Date	Vendor
Rosbank	Finance	12.12.2012	Computershare
Sberbank	Finance	03.02.2012	n.a.
Sberbank	Finance	30.12.2011	IT department
Sberbank	Finance	12.11.2011	IT department
Sberbank	Finance	06.05.2011	IT department
VTB	Finance	01.02.2011	Asteros
Rosbank	Finance	15.12.2010	IBM
VTB	Finance	12.05.2010	EPAM Systems
AFK Sistema	Finance	05.11.2009	Nokia Siemens Networks
Sberbank	Finance	07.09.2012	n.a.
Sberbank	Finance	10.12.2012	Lanit
VTB	Finance	16.11.2012	n.a.
Sberbank	Finance	19.09.2012	I-teco
Sberbank	Finance	21.02.2012	SAP
Bank of Moscow	Finance	26.12.2011	SAS
Saint-Petersburg Bank	Finance	02.09.2011	CSBI Group
Sberbank	Finance	30.05.2011	Sitronics IT
Sberbank	Finance	02.05.2011	Neoflex
Rosbank	Finance	14.04.2011	Neoflex
Bank Saint Petersburg	Finance	11.04.2011	Cleverics
Bank of Moscow	Finance	15.03.2011	AMT Group
VTB	Finance	17.12.2009	TopS BI

Table A2. Financial Sector Announcements

Company	Industry	Announcement Date	Vendor
LenEnerg	Manufacturing	25.08.2011	Omninet
Rosneft	Manufacturing	07.07.2011	InterTrast
Kalina	Manufacturing	4.06.2011	ALPE consulting
KAMAZ	Manufacturing	17.05.2011	SAP
Razgulay Group	Manufacturing	05.05.2011	1C
Russian sea	Manufacturing	26.04.2011	Directum
Baltic Beverages Holding	Manufacturing	25.04.2011	Monolit-Info
Norilsky Nikel	Manufacturing	19.04.2011	IT department
VSMPO Avisma	Manufacturing	07.04.2011	NPO Computer
KAMaZ	Manufacturing	16.03.2011	SAP
Tatneft	Manufacturing	15.03.2011	IT department
Slavneft	Manufacturing	10.03.2011	ABSZEiM
MRSC	Manufacturing	03.02.2011	IT department
KAMAZ	Manufacturing	24.02.2011	Intelcom
RAO ES Vostok	Manufacturing	18.01.2011	Lanit
Norilsky Nikel	Manufacturing	11.01.2011	I-teco
Gazprom neft	Manufacturing	09.12.2010	Cognitive Technologies
Irkut	Manufacturing	30.11.2010	GMCS
Lukoil	Manufacturing	11.11.2010	Emerson
Mesk	Manufacturing	29.10.2010	Sov.techno
VSMPO Avisma	Manufacturing	21.10.2010	Directum
Irkut	Manufacturing	19.10.2010	GMCS
Inter RAO	Manufacturing	10.09.2010	Stinscoman
OGC-2	Manufacturing	02.09.2010	Korus consulting
Polyus gold	Manufacturing	25.08.2010	IBS
Rosneft	Manufacturing	26.07.2010	Electronic Office Systems
Gazprom neft	Manufacturing	20.07.2010	1C-RaRus
Gazprom neft	Manufacturing	05.07.2010	1C-RaRus
Rosneft	Manufacturing	28.06.2010	DocsVision
TGK-6	Manufacturing	16.06.2010	1C-RaRus
Razgulay Group	Manufacturing	26.05.2010	Navicon
TGK-1	Manufacturing	17.05.2010	Proektnaya PRACTIKA
IrkutskEnerg	Manufacturing	15.04.2010	Software AG & IDS Scheer
Rosneft	Manufacturing	13.04.2010	Business IT
Baltic Beverages Holding	Manufacturing	10.03.2010	Autotracker
Lukoil	Manufacturing	15.02.2010	Manzana Group
RusGidro	Manufacturing	04.02.2010	1C Automatization
Sinergiya	Manufacturing	21.01.2010	Polikom Pro
NLMK	Manufacturing	28.01.2010	1C Inteco
Gazprom	Manufacturing	27.01.2010	Asteros
RusGidro	Manufacturing	13.01.2010	IT department
TGK-6	Manufacturing	08.12.2009	1C-RaRus
Gazprom neft	Manufacturing	01.12.2009	AXELOT
Severstal	Manufacturing	25.11.2009	SAP
Irkut	Manufacturing	03.11.2009	Intalev

Table A3. Manufacturing Sector Announcements

Appendix 2. Example Announcement

Example of an announcement of investment in innovative IT

JSC "INTER RAO UES" and JSC "Steens Coman" signed a contract for the implementation of high-tech trading system

Publication: Press-release.ru: Hi-tech

Provider: Press-Release.ru

September 10, 2010

JSC "INTER RAO UES" has signed a contract with JSC "Steens Coman" in the introduction of high-tech systems for managing portfolios of commercial contracts, trading activities generating assets and business risks. The project will last for one year and is aimed at improving the quality of planning and forecasting trading activity.

As a result of the project JSC "INTER RAO UES" will receive an integrated assessment software business risks, and the formation of the optimal control trading portfolio of export- import operations and generating assets in electricity trading and power in the domestic and foreign markets.

The software has no analogues in Russia. It is adapted to the Russian power market and takes into account the objectives of "INTER RAO UES" in the export and import of electricity.