ESSAYS IN EMERGING EQUITY MARKETS

by

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A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2007

This manuscript has been read and accepted for the
Graduate Faculty in Business in satisfaction of the
dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

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Previous studies on the effects of cross-listing on firm value have largely omitted companies domiciled in Central Europe and Russia due to data scarcity. In this paper, I seek to rectify this hiatus by examining valuation differences between companies that choose to cross-list their stocks in other markets through the issue of Depositary Receipts (DRs), and comparable firms from Central Europe and Russia that choose not to cross-list. The results herein indicate an average valuation premium of 20% in a sample of 43 companies domiciled in Hungary, the Czech Republic, Poland and Russia relative to 123 companies from the region that choose not to cross list. After controlling for country-level legal shareholder protection, and a host of country-specific micro- and macro-economic variables, the results reveal that firms that have less access to sound money in domestic markets and firms from countries with large government sectors are more likely to issue a depositary receipt. These companies also realize a higher market value, measured by Tobin's Q, as a result of overcoming domestic financing constraints and poor institutional

arrangements. Moreover, this study reveals that companies from countries with a lower level of economic freedom, as measured by the World Index of Fraser Institute, are also more likely to cross-list.

Acknowledgments

I would like to thank the dissertation committee for their tremendous help and encouragement in the process of completing this thesis. My special gratitude goes to Professor Kishore Tandon, the chairperson of the dissertation committee, Professor Jay Dahya, whose guidance was extremely helpful, and Professor Joseph Weintrop, the Director of the Ph.D. program in Business.

I am indebted to my family and friends for their support throughout the years. Special thanks go to my parents, my husband Edward and his family, my sister Natalia and her family, and to the Ph.D. students and faculty members of Baruch College and CUNY.

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INTRODUCTION

It is well established that country differences in laws, their enforcement, and more generally, the level of legal protection afforded to investors is related to market development and stock market capitalization.[1] This macro-level relation would also appear to hold at the micro (firm-specific) level as well. For example, La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) present a theoretical model which shows that companies domiciled in countries with a low level of investor protection trade at a market value discount.

La Porta et al. (2002), La Porta, Lopez-de-Silanes and Shleifer (2006) and Doidge, Karolyi and Stulz (2004) show empirically that firms located in countries with weak legal shareholder protection are associated with lower market valuations (as measured by Tobin's Q) than firms domiciled in countries with a higher level of legal shareholder protection. The difference in market valuations, or the market value discount, between those firms in low versus high shareholder protection countries remains statistically significant even after controlling for such factors as firm size, cash flow rights, voting rights and growth opportunities. Such a market value discount has also been empirically documented by Claessens, Djankov, Fan and Lang (2002), Klapper and Love (2004) and Durnev and Kim (2005) and is commonly attributed to the ability of a controlling shareholder and insiders to divert corporate resources from other shareholders to themselves for personal consumption.

The two most cited mechanisms in the literature that work toward limiting the ability of a controlling shareholder and insiders to expropriate resources are the cross-

[1] Reese and Weisbach, 2002; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1998; La Porta, Lopez-de-Silanes and Shleifer, 2006.

listing of securities and the adoption of better corporate governance standards. These methods help to alleviate the market value discount at the firm level, which is measured by the difference in Tobin's Q between cross-listed and comparable domestic companies that chose not to issue a depositary receipt (DR).

The commitment to cross list their securities, by a company domiciled in a country with weak legal shareholder protection to a stock exchange in a country that affords a higher level of shareholder protection has been shown to significantly reduce the market value discount. For example, Doidge et al. (2004) show that the market value discount can be reduced by 37% through the cross-listing of securities on a stock exchange, such as the NYSE, NASDAQ, or LSE, which provides investors with greater assurance. The difference in valuation is 16.5% for the overall sample of cross-listings including over-the-counter and private listings. In essence, companies from emerging markets that provide weak legal shareholder protection enjoy a higher valuation, if they cross-list their stock on exchanges in developed markets (Doidge et al., 2004; Reese and Weisbach, 2002; Miller, 1999).

The adoption of better governance standards by a company domiciled in a country with weak legal shareholder protection has also been associated with a reduction in the market value discount, first documented by La Porta et al. (2002). Further, Durnev and Kim (2005) and Klapper and Love (2004) report a lower market value discount in companies that adhere to a high level of corporate governance. Similar to a cross-border listing to a country with stronger legal protection, the higher quality of governance increases the costs of diversion to a controlling shareholder and insiders. The consequence of improved governance is that less diversion occurs for personal

consumption for insiders and firm value increases. Durnev and Kim (2005) and Klapper and Love (2004) both estimate cross-country regressions in which corporate value is the dependent variable and is measured by Tobin's Q. The key independent variable is a firm specific 'quality' of corporate governance, which is proxied by Credit Lyonnais Securities Asia (CLSA) corporate governance scores and Standard & Poor's (S&P) transparency rankings.[2]

The above studies document alleviation in the market value discount and report that market-to-book asset ratios are positively correlated with country-level legal shareholder protection, cross-listing and better corporate governance standards. This implies that firm value can be increased by either cross-listing or by the adherence to higher corporate governance standards. Nevertheless, the corporate governance effect is less discernible and obvious in comparison to the decision to cross-list abroad since better governance, by default, entails a somewhat subjective assessment, while cross-listing is a binary choice variable. As a result the impetus of this study is on the decision to cross-list rather than on corporate governance standards, an examination of which is left for further research.

In this study, I extend the existing literature on the effects of cross-listing by exploring the market value discount in firms domiciled in Central Europe and Russia, following their decision to list on the NYSE, LSE and Over-the-Counter as Depositary Receipts (DRs) and Rule 144a private placements.

[2] The CLSA index is based on the 70 survey questions related to corporate governance structure and answered by financial analysts. It relies on comprehensive, yet partially subjective method. S&P scores give weight to qualitative and quantitative board of directors' characteristics, and are objective.

The primary motivation for this research stems from two key shortcomings in prior studies that examine the relationship between the market value discount and the cross-listing decision. The studies that are most closely related to this one are La Porta, Shleifer and Vishny (1998), Doidge et al. (2004), Reese and Weisbach (2002) and Miller (1999), which choose to exclude companies located in Central Europe and Russia from their cross-country analyses. Second, prior cross-listing studies have largely focused upon legal shareholder protection and enforcement and have neglected other country-specific aspects such as government regulation, monetary system management, international openness and integration, and corporate taxation all of which are also likely to affect corporate market valuations. In this research I seek to rectify these shortcomings.

Further, the Central European and Russian region has been witness to rapid economic growth over the last decade, as measured by an increase in economic production (GDP and GNP) and stock market development. This has resulted in significant capital market growth in several countries in the region, as evidenced by the increasing numbers of IPOs and business expansions in all industrial sectors - most prominently in the telecommunications, oil, gas and energy sectors.

Conventional wisdom suggests that economic growth also matters for firm valuation. Hail and Leuz (2006) document a positive valuation effect to all types of U.S. cross-listings stemming from changes in growth expectations, since Tobin's Q or realized stock returns around U.S. cross-listings are likely to reflect such growth effects in cash flows. In addition, higher real per capita growth is also associated with market liberalization (Bekaert et al., 2001; Bekaert et al., 2002). Thus, Karolyi (2006) notes

that liberalization is positively linked to the amount of cross-border capital flows and to the number of cross-listings.

In addition to liberalization in Central Europe and Russia, and their departure from common socialist settings, several globalization trends have been responsible for significant economic and capital market growth. First, emerging economies such as Central Europe and Russia have an abundance of low-cost labor, natural resources, property and equipment that result in lower operating costs, greater revenues and higher firm value. For example, a recent report by the Boston Consulting Group shows that the establishment of a manufacturing site complete with grounds, buildings, roads, power and water lines in Central Europe and Russia costs nearly 60 percent less than that in a developed economy.[3] The costs of labor are also typically 10 to 20 times lower in a developing market: labor rates for manufacturing workers run from $4 to $5 per hour in Eastern Europe, while comparable rates for manufacturing employees in Western Europe and Japan are almost four times higher.[4] Therefore, set-up and labor savings alone can translate into overall savings of 20% to 40% in the net cost of many end products and services. Figure 1.1 presents comparative labor costs and annual growth in industrial production across three countries in Central Europe (namely Czech Republic, Hungary, Poland), Russia, Japan and the United States. It is unsurprising to envision that lower manufacturing costs positively affect the market value of companies. Cost

[3] The New Global Challengers. How 100 Top Companies from Rapidly Developing Economies are Changing the World. The Boston Consulting Group Report. May 2006.

[4] Emerging Giants. Business Week Cover Story. July 31, 2006.

savings also induce foreign investment into the region, and send positive signals to investors about further future economic growth.[5]

Second, challenging operating environments in emerging countries provide opportunities for innovative and efficient companies to reap the benefits of liberalization. The challenges include selling profitably to low-income customers, dealing with inefficient logistics and distribution, operating in ambiguous legal environments, and shortages of management talent. These challenges create an environment that nurtures rapid innovation and the ability to adapt to changing needs.

The legal environment and quality of institutional framework have a direct impact on equity valuation (La Porta et al., 1998 and 2002). Several studies show that companies from countries with weak legal regimes are valued more when they cross-list abroad. Doidge, Karolyi, and Stulz (2004) and Lang, Lins and Miller (2003) find stronger valuation effects among firms that come from countries with "poor" treatment of minority shareholders or those that have large blockholders.

Third, as noted briefly above, in addition to growth in microeconomic variables several macroeconomic factors have also witnessed significant and sustained improvement over the past decade. According to IMF statistics (World Economic Outlook, 2005), the Czech Republic, Hungary, Poland and Russia have reported the highest growth of real GDP in the region at around 6%. This is nearly 3 times larger than the growth documented in many developed markets. For example, real GDP growth in emerging Europe stabilized at 5.4% in 2005, while over the previous 10 years the growth has been much higher averaging around 7%. Table 1.1 reports these statistics.

[5] Ibid., Business Week, July 31, 2006.

Table 1.2 presents data on inflation and the current account deficit in Central Europe and Russia over the period 2004 through 2007. These variables are important determinants of economic stability, growth and firm valuation. Karolyi (2004) examines the effects of stock market development on the number of ADR listings. He finds that the ratio of market capitalization to GDP, equity flows and trading activity are positively related to the number of cross-listings.

The data in Table 1.2 show that inflation has been stable in Hungary, Czech Republic, and Poland following their inclusion in the European Union, since they had to meet the requirements of the Maastricht Treaty in 2002. While, non-EU CIS countries, including Russia, are experiencing high levels of inflation, their current account balance remains in good shape, with a surplus of about 11% of GDP. In contrast to a stable current account balance in Russia, countries in Central Europe experienced current account deficits averaging at 5.2% of GDP in 2005. Development in current accounts differs across countries: the current account deficit in Hungary was 7.9% of GDP in 2005, and 1.6% in Poland. The IMF World Outlook (2005) projects an increase in the current account deficit in Poland to 3.1% of GDP, and a slight decline to 7.5% of GDP in Hungary by the end of 2007. These deficits are closely associated with fiscal imbalances in these countries.[6]

As expected, the growth of GDP, low inflation in Central Europe, low current account deficits in Russia and low production costs, coupled with the advent of market-based competition, has caused somewhat increased investor interest in corporate

[6] World Economic Outlook, IMF, 2005. Economic Prospects and Policy issues. Chapter 1. Emerging Europe: addressing rising current account deficit.

activities in the region. Actual investments in stocks by individuals, however, continue to languish behind the fervor. An apparent lack of shareholder protection and enforcement of securities laws is cited as one of the key reasons for the lack of participation in equity investments by individuals in Central Europe and Russia. Durnev and Kim (2005) report that the average index of legal shareholder rights enforcement for the Czech Republic, Hungary, Poland, and Russia is equal to 22.2, compared to 40.0 in New Zealand and Australia.

A low level of confidence in capital markets in Central Europe and Russia is not confined only to domestic investors. Traditionally, overseas investment into the region has also been perceived to carry high degrees of default risk. However, in the wake of large and high-profile corporate scandals in the United States, including Enron, WorldCom and Global Crossing among others, emerging markets may not appear to be as risky as previously thought. At the same time, they provide high levels of return. For example, over the period from January 2000 through March 2006, total shareholder return in Morgan Stanley's Emerging Market Index rose by approximately 100%, while that of the S&P 500 declined by 7% (see Table 1.3).

Despite high rates of return, the primary shortcomings of emerging markets are their inability to provide necessary capital to sustain economic growth in the region. Put simply, emerging markets often do not allow companies to attain a global scale, forcing them to seek opportunities overseas. The decision to globalize is driven by the need to create sustainable advantage, shareholder value, and investor protection when domestic legal regimes and institutional frameworks are weak.

As noted at the onset, one way to achieve a global presence is through the issuance of a depositary receipt (DR). Conventional theory states that a primary goal of cross-listing is to overcome investment barriers and lower the cost of capital as a firm makes its shares accessible to foreign investors.[7] Recent research focuses on corporate governance and agency problems, which are intensified by the need of firms in developing markets to expand. Karolyi (2006) provides an excellent survey of new research initiatives in five major areas associated with cross-listings: corporate governance, changes in information environment, liquidity, capital market monitoring, and adverse spillover effects. Studies in the first area of research show that cross-listing is a vehicle through which controlling shareholders can commit to higher corporate governance standards and avoid self-dealing (Stulz, 1999; Coffee, 1999, 2002; Licht, 2003). This is known as a bonding hypothesis of cross-listing, advanced by Stulz (1999) and Coffee (1999), and empirically tested by Doidge, Karolyi and Stulz (2004) and Doidge (2004) and Hail and Leuz (2006), among others. The second research area considers extensive information disclosure associated with cross-listings, which leads to improved analyst coverage, more accurate earnings forecasts, and higher valuations (Lang, Lins and Miller, 2003; Bailey, Karolyi and Salva, 2006; Sarkissian and Schill, 2004). The third area examines the influence of cross-listings on stock returns and their role in price discovery (Gagnon and Karolyi, 2006; Koumkwa and Susmel, 2005; Baruch, Karolyi and Lemmon, 2005; Leuz, Lins and Warnock, 2005). The fourth major area shows that large institutional investors serve as effective monitoring agents in DR

[7] Karolyi (1998, 2006) surveys contributions to the traditional market segmentation wisdom. Major inputs include papers by Miller, 1999; Foerster and Karolyi, 1999; Howe, Madura and Tucker, 1993; Lau, Diltz and Apilado, 1994; Jayraman, Shastri and Tandon, 1993; Domowitz, Glen and Madhavan, 1998, among others.

markets (Kumar and Ramchand (2005), Burns (2004), Tolmunen and Tostila (2005), among others). The final set of research documents that DR listings are often associated with negative spillover effects in domestic markets when trading migrates to international exchanges and local turnover and liquidity suffer (Levine and Schmukler, 2006; Claessens, Klingebiel and Schmukler, 2002; Lee, 2003, among others).

The research herein contributes to several major areas, identified by Karolyi (2006), including the literature on share price reactions to cross-listing decisions and on the differences in bonding constraints for cross-listed firms with exchange presence and those pursuing OTC and Rule 144a private placements. This paper seeks to explain valuation differences between companies from Central Europe and Russia that issue depositary receipts and comparable firms in the region that do not cross-list. Controlling for firm-specific and country-specific variables uncovers higher Tobin's Q for cross-listed companies. Moreover, this study reveals that companies from countries with less economic freedom are more likely to cross-list, when economic freedom is measured by the World Index, compiled by the Fraser Institute.[8]

In addition to the effectiveness of the legal system in protecting minority shareholders, which is extensively discussed in prior research (La Porta et al., 2002, Doidge et al., 2004, Reese and Weisbach, 2002), the World Index takes into account supplementary country characteristics such as government involvement in the economy, access to sound money, openness of an economy to international trade and investment, and labor market conditions. Interestingly, the first two components of the World Index are statistically significant in determining the corporate valuation premium. This

[8] Fraser Institute in Canada provides annual country ratings in five areas of economic freedom, which are discussed in Chapter 3 of this research. The data are available at www.fraserinstitute.ca.

research also uncovers that firms from countries with large government sectors are more likely to cross-list. In addition, companies from countries that have difficulty in accessing money are more likely to seek a cross-listing. Both groups of firms realize higher valuation premiums than their local counterparts. These results hint the importance of financial development and growth variables in the decision to cross-list and firm valuation.

The interesting additional result is that a cross-listing premium exists for firms that pursue SEC Rule 144a and Over-the-Counter placements. This finding is consistent with Pinegar and Ravichandran (2004) and O'Connor (2004), who challenge the legal bonding hypothesis. According to the latter hypothesis controlling shareholders make a credible commitment to minority investors that they are willing to curb their diversion of benefits by undertaking the decision to cross-list. However, stricter corporate governance regulations that come with Level 2 and Level 3 cross-listings are not present in Rule 144a and Over-the-Counter placements. These firms should, in theory, not experience any major impact on Tobin's Q from the cross-listing event, and yet they do. This implies that mechanisms other than legal bonding are responsible for the higher valuation premiums in these firms. Pinegar and Ravichandran (2004) propose that the voluntary disclosure of information might be responsible for their finding. Siegel (2005) suggests that a firm's reputation improves with cross-listing, even if it is an OTC or a Rule 144a placement. He advances that the reputational bonding argument can explain the valuation premium of such listings.

The key research question of the current thesis is the impact of cross-listing on firm value in countries of Central Europe and Russia. The companies from this region

are characterized by an abundance of affordable natural resources, educated labor force, and high shareholder returns. On the downside, the political and economic risk of the region remains substantial, with volatility in inflation in Russia and current account deficits in Hungary, Poland, and the Czech Republic. These macroeconomic factors contribute to a market value discount for firms domiciled in the region. The question that this research seeks to address is two-fold. The first issue centers on whether cross-listing provides a way to eliminate the market value discount in firms from Central Europe and Russia. And the second, examines whether macroeconomic factors contribute to a firm's decision to cross-list. These questions are answered in the remainder of this thesis, which is organized as follows. Chapter 1 analyzes the recent literature related to the two major hypotheses – market segmentation and bonding. Chapter 2 examines the stock price response to the cross-listing decision. Chapter 3 analyzes how cross-listing affects Tobin's Q after controlling for country, industry, and firm characteristics. The last chapter summarizes the major findings of this study and presents ideas on future research.

CHAPTER 1. LITERATURE REVIEW

The market for depositary receipts was created in the 1920s, and has expanded sharply in size and scope. During the 1990s many emerging countries opened up their economies to foreign investors and cross-listed their common stock abroad. The trading volume of DRs rose to a record high of $932 billion in the first half of 2006 in both the U.S. and in the international arena.[9] The Bank of New York, JPMorgan and Citibank dominate operations of the DR market. Chapters 2 and 3 of this research examine depositary receipts from selected countries issued by the above-mentioned depositories. This study focuses on the depositary receipts from Central Europe and Russia, which are presented in Table 1.4. Previous empirical evidence on effects of cross-listings on firms from emerging markets focused mainly on Latin America and Asia, which have a long history.[10] This study is filling the gap in the literature on stock price and market value changes around cross-listing of firms from the countries of Central Europe and Russia that started their stock market development in the early 1990s.

I. Overview of Depositary Receipts (DRs)[11]

For U.S. investors, American Depositary Receipts (ADRs) provide an alternative to investing in overseas equities directly without the inconvenience of

[9] *Barron's*, September 25, 2006.

[10] Domowitz, Glen and Madhavan (1998), Martell and Webb (1999), Jithendranathan, Nirmalanandan and Tandon (2000), Pinegar and Ravichandran (2002), Pasquariello (2004), among others.

[11] Karolyi (1998, 2006) provides an excellent overview of Depositary Receipts and the related research trends.

currency conversion and foreign settlement procedures. ADRs are treated in the same manner as US securities for all legal and administrative purposes.

The main advantages of Depositary Receipts are the elimination of currency conversion in trading and in dividend receipts, minimizing overseas transaction costs and custodial fees, and ensuring uniformity in information available as a result of mandatory disclosures. When actual shares from overseas company are deposited in a custodian bank, a bank in the U.S. issues depositary receipts against these shares. The depository collects and makes payment of dividends and performs all functions with respect to shareholder voting as stated in the DR. According to the Bank of New York, once 3–6% of the foreign company's shares are available as ADRs, true intra-market trading emerges.[12] When executing an ADR trade, brokers seek to obtain the best price by comparing the US$ ADR price to the dollar equivalent price of the actual shares in the home market. This process ensures parity and tends to keep the price differential (exchange rate adjusted) between the foreign stock and the ADR to a minimum.[13]

As noted above, ADRs are dollar-denominated negotiable certificates representing a pre-specified number of a foreign company's publicly traded equity held on deposit in the issuer's domestic market. They allow foreign investors to undertake international portfolio diversification while avoiding trade and settlement failures that are common in emerging markets. Other benefits that accrue to ADR investors include diversification without costly currency conversions, unreliable custodial services, poor

[12] www.bankofnewyork.com/adr

[13] However, there are instances when due to limited supply, ADRs may trade at a premium over the exchange-adjusted home prices.

information flow, and dealing with unfamiliar market practices when investing directly into foreign emerging markets.

ADRs are classified into several groups: Level 1, Level 2, Level 3, Regulation S, and private placements under Rule 144a. Level 1 ADRs are viewed as the simplest way for companies to access U.S. capital markets. They do not raise new equity, and are traded in the over-the-counter (OTC) market in the U.S. with prices published in the "pink sheets" in accordance with Rule 12g3-2(b). They do not require full Securities and Exchange Commission (SEC) registration, and the company does not have to report its accounts under U.S. Generally Accepted Accounting Principles (GAAP) or provide full SEC disclosure. Depositary shares are registered on Form F-6 with the SEC, and they allow companies to enjoy the benefits of a publicly traded security without changing its current financial reporting process, whilst using existing shares without raising new equity capital. The average cost of issue to the company is estimated to be less than $25,000 and the average time to completion is 10 weeks, which is the average number of weeks from selection of a depositary bank to the first day of trading. Incidentally, Level 1 ADRs are exempt from some provisions of the Sarbanes-Oxley Act of 2002.

Level 2 ADRs are exchange-listed securities that also do not raise new equity capital for a company. These securities require SEC registration and adherence to applicable requirements under U.S. GAAP. The issuing company files a registration form 20-F with the SEC. The issuing costs vary from $200,000 to $700,000, while the average time to completion is about 10 weeks.

Level 3 ADRs raise new equity capital in the public offering and they trade either on NASDAQ, AMEX, or the NYSE. The issuing company is required to fulfill the highest level of SEC disclosure requirements, comply with U.S. GAAP, report quarterly financial statements, and meet the listing requirements of the U.S. Exchange, where it is listed. The issue costs range between $500,000 and $2,000,000, and the time to completion averages approximately 14 weeks.

The fourth group of ADRs includes privately placed ADRs. They fall under SEC Rule 144a, which raises capital through the private placements of DRs with large institutional investors, who must be qualified institutional buyers (QIBs). These placements are exempt from SEC registration and the financial statements of the issuing companies do not have to be reconciled according to U.S. GAAP. It is common practice to establish a Level 1 program alongside a Rule 144a program. The cost of such a program ranges from $250,000 to $500,000 per issue, and the average time to completion is around 16 days.

The final group comprises Regulation S issues, which are exempt offshore transactions. Regulation S outlines the procedures, referred to as safe harbors, which companies and selling shareholders must follow to ensure that their offers and sales of securities are deemed to occur outside the U.S. These receipts do not require SEC registration since they raise capital through direct placements outside U.S. territories.

Over the past decade, the demand for DRs has grown significantly, though this process has slowed over the last four years. The market has increased in popularity to a point where 40 percent of the U.S. foreign equity investment is now held in the form of ADRs, which accounts for around 10 percent of the total dollar value of U.S. equity

trading.[14] Foreign company listings constitute a significant fraction of total listings across major exchanges such as the London Stock Exchange, the Deutsche Boerse, Euronext, Nasdaq, and the NYSE. Since 2003 the U.S. markets have been losing listings to other markets as a result of costly corporate governance and accounting requirements implemented following the Sarbanes-Oxley Act. For example, nine out of the ten global offerings in 2006 went off-shore.[15] Karolyi (2006) documents the steady growth in DR listings from 1990 to 2001, and 150 net delistings over 2002-2004. Nonetheless, the value of U.S. financial stock still significantly exceeds that of the U.K., Japan and the Eurozone, but its growth rate of 6.5% is below that of all of the above regions.[16] A restrictive climate in the U.S. is thought to have drawn business away from New York, and towards financial centers in Asia, United Kingdom, and Europe.

Notwithstanding, Level 1 DRs are structured such that they give companies, especially from emerging markets, a less costly alternative to gain exposure to the U.S. stock market without incurring the expensive costs associated with Sarbanes-Oxley Act compliance. Companies domiciled in Central Europe and Russia have taken full advantage of this provision by listing mostly over-the-counter as Level 1 DRs and using the bifurcated structure of DR programs. The firms have issued partially SEC Rule 144a Depositary Receipts, privately placed among QIBs in the U.S., and partially SEC Regulation S cross-listings, offered outside the U.S. to foreign investors. Korczak and

[14] London Stock Exchange report (LSE, June 2006).

[15] *Barron's*, September 25, 2006.

[16] Why Spitzer is backing study that endorses less regulation. *The Wall Street Journal,* January 23, 2007.

Bohl (2005) point out that the high costs associated with cross-listings deter more companies from Central and Eastern Europe entering foreign capital markets, with most firms below the size threshold when they can afford a cross-listing. Chapters two and three of this research will discuss the consequence of the cross-listing choice in more detail, and its impact on local stock returns and market value of firms from Central Europe and Russia.

II. Market Segmentation and Integration

Traditionally, valuation effects following the cross-listing of stocks are attributed to market segmentation. Market segmentation refers to direct and indirect barriers that affect how securities are priced in different markets. Direct barriers comprise regulatory frictions arising from foreign exchange controls, withholding taxes, international tax treaties, limitations on foreign ownership of capital or dividend payments, and higher brokerage and trading costs (Black, 1974; Stulz, 1981). When direct obstacles are relaxed, indirect barriers may still remain, for instance higher monitoring costs due to the lack of information about the foreign companies, more lax disclosure requirements, and non-synchronous business and trading hours (Merton, 1987).

2.1. Theoretical models of market segmentation and integration

The theoretical underpinnings of market segmentation are developed by Stapleton and Subrahmanyam (1977), Errunza and Losq (1985), Alexander, Eun and

Janakiramanan (1987), among others.[17] Stapleton et al. (1977) and Alexander et al. (1987) document how the cross-listing of shares across two segmented markets leads to a higher equilibrium market price and a lower required rate of return. The market segmentation hypothesis states that stock prices of cross-listed firms from markets with investment barriers are expected to rise as the additional built-in risk premium for these barriers disappears. The correlation of domestic returns with the world portfolio, as measured by the world beta, increases as segmentation decreases and the country becomes more integrated globally.

Stapleton and Subrahmanyam (1977) determine asset prices for different market structures and provide numerical solutions for pricing dually listed securities using an example of eight firms and twenty investors. The first type of market segmentation, considered in their model is caused by restrictions on individual investors and is exemplified by segmentation in capital markets. The second type is induced by the simultaneous existence of differential personal tax rates and transaction costs. The model numerically derives the equilibrium security prices given these market imperfections. Alexander et al. (1987) present an analytical solution to a similar model, with domestic securities dually listed on a foreign capital market and none of the foreign securities listed on a domestic market. In their model capital markets consist of a dually listed security, purely foreign and purely domestic securities. The expected return on the dually listed security depends on the covariances of its return with the returns of both the domestic and foreign market portfolios, since all the investors hold the dually listed asset. Dual listing of a security on the foreign capital market is found

[17] Karolyi (1998) provides an excellent summary of the theories relating to market segmentation.

to have an "externality effect" of indirectly integrating pure domestic securities with the foreign security market.

Similarly, Errunza and Losq (1985) derive analytical results from their model of "mild" segmentation, which examines international capital market equilibrium under partial segmentation. They assume inability of one class of investors to trade in a subset of securities as a result of government restrictions. More specifically, portfolio inflow restrictions imposed by a foreign government prevent domestic investors from holding foreign securities, while no such controls are imposed by the local government. This unequal access assumption serves as a foundation of their "mild segmentation" model. A subset of investors, called unrestricted investors, can trade all the available securities, while restricted investors can only trade a subset of eligible securities. Ineligible securities, which are available only to unrestricted investors, command a "super" risk premium because of the segmented nature of the market. This premium also measures the effect of segmentation on the cost of supplying risky securities to the ineligible investors by firms. "Super" risk premium vanishes if unrestricted investors become less risk-averse than restricted ones, and if the correlation between returns on portfolios of eligible and ineligible securities tends towards one, leading to a negligible conditional market risk for all securities. The equilibrium price of a security is determined jointly by its international and domestic risk premiums, and removal of investment barriers generally leads to an increase in the aggregate market value of the affected securities. This reevaluation occurs because of the improved ability of domestic investors to diversify their risks internationally. Errunza and Losq (1985) test their model empirically using a sample of stocks from nine developing countries and a random

sample of the U.S. securities over the period 1976-1980. Their results provide tentative support for the mild segmentation hypothesis.

2.2. Empirical tests of market segmentation and integration

The testable implication of the market segmentation theory is that following a cross-listing the domestic beta should decline, while the world beta should increase. This post-listing decrease in systematic risk translates into a lower risk premium demanded by investors, leading to an increase in stock prices in the local market and a decline in the cost of capital. Jayaraman, Shastri and Tandon (1993) examine a sample of 95 firms from seven countries that were registered outside the U.S. but have an ADR listed on a U.S. exchange over the period of 1983 through 1988. They find that the ADR listing day is associated with a positive significant daily excess return of 0.47% on the underlying home stock price. This leads them to conclude that the listing of ADRs provides the company with access to another capital market, allowing it to lower its cost of capital. They also find that the listing of ADRs is associated with an average increase of 55% in the variance of daily returns, a result consistent with the information hypothesis of Freedman (1989), which states that cross-listing provides informed traders with additional opportunities to profit from their long-lived information. Subsequently, Martell, Rodriguez and Webb (1999) examine the risk and return of 25 Latin American equity issues following the introduction of their ADRs in the U.S. equity markets in 1990 to 1994. This study finds that daily average excess returns are not statistically significant. They however do find a pattern of price increase prior to the ADR introduction, which is consistent with the managerial timing hypothesis.

Two studies that challenge the predominant wisdom of market integration benefits are Foerster and Karolyi (1999) and Miller (1999). Foerster and Karolyi (1999) document a pre-listing return run-up and an average post-listing decline in stock price return for their sample of 153 Depositary Receipts from 11 countries in Asia, Australia, Canada and Europe. However, companies from emerging markets experience the same long-run effects as firms from Canada, for example, which clearly have less investment barriers and a higher degree of market integration with the U.S. market. This finding challenges existing wisdom, since under the segmentation hypothesis, emerging market effects should be more pronounced. Foerster and Karolyi (1999) also find that the post-listing decline in stock price return is smaller for capital-raising cross-listings than for non-capital-raising DRs. Miller (1999) examines a larger sample of 181 cross-listings by ADR type. He documents a positive average abnormal return around ADR announcement dates, with a higher reaction for emerging market firms and for exchange listed ADRs. Inconsistent with market segmentation, he finds that foreign firms that list on NYSE or NASDAQ experience the largest stock price response, while the ones on PORTAL experience minimal price changes. Miller attributes this to superior liquidity and investor recognition following the cross-listing.

If markets are indeed segmented, listing in a foreign country with higher level of shareholder protection makes the shares available to a larger pool of investors, thus improving risk sharing. This generally results in smaller capital costs.[18] Errunza and Miller (2000) suggest that a decline in the cost of capital is driven by the diversification

[18] Hargis, 1997; Domowitz, Glen and Madhavan, 1997; Bekaert and Harvey, 2000; Foerster and Karolyi, 1999; Miller, 1999; Errunza and Miller, 2000; Lang, Raedy and Yetman, 2003; Durnev and Kim, 2005; Hail and Leuz, 2006.

potential for firms from segmented economies as predicted by international asset pricing models. They find no evidence of managerial timing, or poor post-listing performance. Of their sample of 126 firms, capital raising ADRs do not have positive excess performance before the listing announcement and no underperformance in the post-listing period. They document a 42.2% drop in the cost of capital in a sample of 126 firms from 32 countries, which they attribute to ADR introduction. Hail and Leuz (2006) also provide strong evidence that cross-listing on a U.S. exchange reduces a firm's cost of capital, even after controlling for risk factors, country fixed effects and firms' cross-listing choices. Similar to Miller (1999), these effects are stronger for firms from countries with weaker institutional structures, consistent with the idea that cross-listings provide a way to opt out and improve upon the home country's institutional framework. Cross-listings on the OTC market are associated with only minor reductions in a firm's cost of capital, while private placements have the opposite effect. Hail and Leuz (2006) use a different approach that does not require a choice of market portfolio or a long-time series of returns. They then examine the ex-ante cost of equity capital that is implied in market prices and analyst forecasts, thus separating the cash flow and cost of capital effects. Their sample of 870 cross-listings provides firm evidence that cross-listing on a U.S. stock exchange results in a reduction in the cost of capital that ranges between 40 and 130 basis points. Cross-listing on the OTC markets reduces a firms' cost of capital by 20 to 40 basis points, while U.S. private placements are associated with an increase in the cost of capital. One explanation offered by the authors is that private placements involve communication with a small group of institutional investors, leading to an asymmetric distribution of information among traders and hence

an increase in the cost of capital. They conclude that cross-listing in the U.S., generally, improves a firm's ability to generate future growth opportunities.

2.3. Tests of market segmentation and integration in emerging markets

Several studies on market segmentation effects of cross-listings have extended their analysis to emerging markets.[19] Domowitz, Glen and Madhavan (1998) examine weekly returns of 25 Mexican stocks that cross-list in the U.S. and find that higher volume and lower costs occur for those companies that have no foreign ownership restrictions. Jithendranathan, Nirmalanandan and Tandon (2000) study the segmentation of the Indian capital market and find that GDR returns of Indian companies are influenced by many domestic and international variables, but only the domestic market has an effect on the returns of the underlying Indian stocks listed in London and Luxemburg. They show that foreign investors, who hold global depositary receipts, estimate the expected returns at a lower level than domestic investors, leading to GDRs being priced at a premium over the exchange rate adjusted prices of the underlying securities. Indian investors, who are constrained only to domestic stocks, demand a higher risk premium on their investments while foreign investors, who are unrestricted in their choice of securities, may settle for a lower risk premium due to the diversification benefits of their larger portfolios. Aybar (2002) studies the performance of 143 privatization-related ADRs from thirty-one emerging and developed countries. The study reports that average cumulative returns of developed country ADRs exceed

[19] Smith and Sofianos (1996); Domowitz, Glen and Madhavan (1998); Jithendranathan, Nirmalanandan and Tandon (2000), Podpiera (2001), Aybar (2002), Pasquariello (2004), Korczak and Bohl (2005), and Hail and Leuz (2006) use developing countries data to test for market segmentation and cost of capital after cross-listing.

those of emerging market ADR returns, while privatization-related ADRs generally outperform their respective country indices and the FT World index, and underperform the S&P 500 Index. Level 1 ADR issues that are traded on OTC outperform the Level 2 and Level 3 ADRs traded on U.S. exchanges, as well as 144A private placements. This result is contrary to Miller (1999) who finds that exchange listed ADR issues realize higher local stock returns than OTC - listed ADRs. Pasquariello (2004) examines the recent episode of financial turmoil in Mexico, East Asia, Russia, Brazil, and Argentina. He argues that in the absence of significant investment barriers and adjusting for fluctuations in the exchange rate, ADRs and their underlying equity should be perfect substitutes, since the holders of an ADR can redeem their certificate into the underlying shares at any point in time by simply paying a small service charge to the custodian. Conversely, new ADRs can be created at any point in time by depositing the appropriate number of these shares in the custodian's hands. However, different tax rules (e.g., on the treatment of dividends), restrictions to capital mobility and foreign ownership of domestic stocks, involuntary dilution of ADR-holders' claims (due to SEC rules on the exercise of rights), limited liquidity, and nonsynchronous trading may limit the efficient realignment of the dollar prices of ADRs and their corresponding domestic stocks. Pasquariello (2004) tests whether efficiency in the market for emerging ADRs is altered during periods of financial stress and finds that normal market conditions are violated during financial crises. The law of one price often ceases to hold, and domestic sources of risk become more important for many depositary receipts in the sample -- a result, which he attributes to uncertainty among investors, exchange rate volatility, economic segmentation, and illiquidity.

Under the segmentation hypothesis, firms from capital markets that are highly integrated with the U.S. should exhibit smaller cross-listing effects than firms from segmented and less developed markets. This would be especially true for companies from transitional economies that have faced market segmentation over a long period of time. Studies on such settings are few, and this research produces much needed additional evidence on the issue. The few studies conducted on countries in this region include Claessens, Djankov and Klingebiel (2000), Podpiera (2001) and Korczak and Bohl (2005). Korczak and Bohl (2005) use a sample of 33 cross-listed stocks from Czech Republic, Hungary and Poland, Russia, Slovakia and Slovenia, which are amongst the most developed countries in the Central European region. They report that companies from these 6 countries experience a permanent value enhancement and realize cumulative abnormal returns of 26% around the DR offering. Their stock liquidity improves, and average trading volume in the domestic market increases significantly after the cross-listing. They attribute these findings to the level of costs associated with underdeveloped local capital markets that companies and investors have to bear. Claessens, Djankov and Klingebiel (2000) find that the average size of cross-listed companies from Central European countries is twelve times larger than those that are listed only domestically, which suggests that local markets are too small to provide large corporations with adequate levels of financing and liquidity needed to sustain growth. Podpiera (2001) examines the microstructure effects of cross-listing for ten stocks from Central Europe (Czech Republic, Hungary and Poland) using intraday data from the London Stock Exchange. He finds that volatility increases for 7 out of the 10 stocks after the GDR listing date. Increased trading volume and investor recognition are

the key causes of increased volatility. He concludes that information flows between local and foreign markets are cointegrated, and the application of an error correction model shows that arbitrage works in all markets to correct any pricing errors that might exist.

2.4. Financial development and cross-listing activity

Another strand of literature linked to this research relates financial and economic development to cross-border activity. [20] Claessens, Klingebiel and Schmukler (2006) use income per capita, macroeconomic policies and efficiency of legal system as determinants of stock market development. They find that the degree of migration to international exchanges increases as those fundamentals improve. This in turn leads to lower cost of capital, better terms for listing and improved share liquidity. On the downside, it can also result in a low domestic liquidity to sustain the local exchange – an adverse spillover effect evident in other studies.[21] Moel (2001) examines three aspects of market development in 28 emerging markets: openness, which is a proxy for the degree of market transparency and investability; liquidity, which is a measure of market activity, and the growth in domestic listings. He concludes that ADRs appear to negatively affect domestic investments, liquidity and growth, but they appear to increase accounting standards and disclosure-related openness. In contrast, Rajan and Zingales (2003) find that trade openness, measured by exports and imports of goods

[20] Rajan and Zingales, 1998, 2001, 2003; Moel, 2001; Karolyi, 2004; Prasad, Rajan and Subramanian, 2006; Levine and Schmukler, 2006; Claessens, Klingebiel and Schmukler, 2006; Edison and Warnock, 2003, Bekaert, Harvey and Lundblad, 2005.

[21] Moel, 2001; Edison and Warnock, 2003; Lee, 2003; Karolyi, 2004; Levine and Schmukler, 2006.

over GDP, is positively correlated with financial market development, proxied by the ratio of equity market capitalization to GDP, and that relation is especially strong when there are no capital restrictions on cross-border flows.

Rajan and Zingales (1998) study the link between financial dependence and growth, and conclude that industrial sectors that need a lot of external financing have high rates of growth in countries with more developed financial markets. In a more recent paper, Prasad, Rajan and Subramanian (2006) find that while the latter is true for developed countries, non-industrial countries that have relied more on foreign finance have not grown faster in the long run due to their limited ability to absorb foreign capital, which is measured by changes in current account balances.

Several insights stem from the literature on market segmentation and integration. First, strong information flows and linkages between the home and the foreign markets are beneficial to cross-listed firms in terms of cost of capital reduction and positive market reaction. Second, the degree of integration between local and foreign markets plays an important role for cross-listing effects to materialize. If most cross-listings are indeed conducted to avoid previous market segmentation and provide companies with the improved access to capital markets, then companies from countries with severe investment barriers will experience the greatest cross-listing benefits. Current research would appear to confirm this argument.

The next section focuses on corporate governance and agency problems that accompany cross-listings. Internationalization allows companies to alleviate informational asymmetry problems by “bonding” themselves to markets with greater disclosure requirements and stronger shareholder protection systems.

III. Bonding Hypothesis and Cross-listing Premium: Role of Corporate Governance

Several studies question the extent of market segmentation in explaining cross-listing benefits. Stulz (1999, 2005), Coffee (1999, 2002) and Reese and Weisbach (2002) argue that even firms from countries with few investment barriers realize abnormal returns and improve stock values after they cross-list their shares. Karolyi (2004, 2006) asserts that the market segmentation hypothesis cannot fully explain the time series patterns of cross listings, since dual listings have increased in the 1990s, while market segmentation has declined noticeably.

An alternative explanation for positive valuation effects of cross-listings has its foundations in the literature on corporate governance and ownership. The "bonding hypothesis" implies that the valuation premium can be attributed to increased disclosure and corporate governance standards that accompany a cross-listing. Companies that decide to cross-list abroad, especially in the U.S., are subject to stringent disclosure requirements. Listing in a market that involves a greater transparency of financial reports reduces agency costs of controlling shareholders, and reveals firms of better quality. This section describes the underpinnings of the legal and reputational sides of the bonding hypothesis.

3.1. Legal bonding

A number of theoretical studies contribute to the development of the bonding hypothesis.[22] Stulz (1999, 2005) and Coffee (1999, 2002) relate the cost of capital to information asymmetry and corporate ownership. Stulz defines governance as the set of mechanisms that affect how information and agency cost problems impact firm value. He argues that foreign institutional investors can stabilize the shareholder base of a cross-listed company, and secure improved levels of corporate governance standards using their monitoring capabilities. Globalization allows new investors to monitor management in ways that local shareholders cannot. It also changes the market for corporate control: for example, a firm that is immune from takeovers in a closed local setting may not be protected from potential bidders in the international market. Coffee expands this from the perspective of law and investor rights. He claims that the application of U.S. securities law would impose transparency and significantly constrain opportunism by controlling shareholders. This opportunism, also referred to as self-dealing, lies in the core of corporate governance issues. Investors incur costs of implementing governance mechanisms to ensure that insiders and directors do not derive private benefits beyond agreed levels. Markets with better protection of minority shareholders will attract firms with dispersed ownership, while markets in low corporate governance countries will trade shares of firms with concentrated ownership. Stulz (2005) finds that concentrated corporate ownership brings "twin agency problems": expropriation not only by firm insiders but also by state entities. Using the sum of

[22] Cantale, 1996; Licht, 1998; Fuerst, 1998; Moel, 1999; Stulz, 1999, 2005; Coffee, 1999, 2002.

insider and block ownership, Stulz shows that insider ownership increases as protection of minority shareholders weakens and as political risk goes up.

Cantale (1996) and Fuerst (1998) add information asymmetry to the bonding hypothesis and characterize a signaling equilibrium where firms with better financial prospects are able to distinguish themselves from firms of lower quality by cross-listing in markets with stricter regulatory requirements. Fuerst (1998) models the manager's decision to cross-list shares, when additional regulatory exposure is offset by higher stock prices. His model results in a positive market reaction to the firm's announcement to cross-list, even in the absence of segmentation or any difference in liquidity and shareholder base between markets. In his model, he includes the home market and two competing foreign markets with different regulatory strictness. Good–type firms reveal their high quality through listing on the market with strict regulatory exposure and high investor protection. Fuerst (1998) indicates that it might be of interest to stock exchanges, which compete for order flow, to create layers of regulatory environment and attract good-quality listings instead of eroding listing standards below optimal levels (race-to-the-top versus race-to-the-bottom equilibrium, as defined by Coffee, 1999).

Licht (1998), Coffee (2002) and Rock (2002) discuss harmonization of national legal regimes in securities regulation.[23] As more cross-listings occur, the importance of variations in legal regimes should decline across countries, and a generalized model

[23] Licht (1998) discusses convergence of accounting principles universally used in cross-border listings by International Accounting Standards Committee and International Organization of Securities Commission. Coffee (2002) envisions dual equilibrium, where high disclosure exchanges serve high-quality issuers, while firms desiring less transparency and some degree of liquidity list on lower-disclosure exchanges. Licht (1998) and Rock (2002) argue that the U.S. securities legislation provides both foreign and domestic issuers with a vehicle to credibly commit to minority investors through comprehensive disclosure.

would impose transparency and constrain self-dealing by insiders. However, it is not true in the area of corporate governance, which is embedded in national economic and legal systems. Kogan, Khanna and Palepu (2006) demonstrate that countries imitate each other's governance laws without de facto convergence of governance practices. Licht (1998) makes a distinction between securities regulation as being a part of public law domain and corporate governance as being a part of private law. The idea of twin agency problems (Stulz, 2005) also rests on the separation between state entities and private parties. Private laws are less prone to harmonization since they remain largely a national matter. Differences in corporate governance are associated with the level of economic development, such as the size of the market, the degree of investor protection, and the form of development, for example capitalist or socialist influence, degree of concentration of ownership, stockholding structure, and directors' affiliation. La Porta, Lopez-de-Silanes and Shleifer (2006) show that securities regulation works better if enforced privately through contracts rather than through public laws, and conclude that private monitoring works better in common law countries.

3.2. Macroeconomic factors and the impact on firm value

Empirical studies confirm the importance of country factors in determining governance structure, capital structure, degree of shareholder protection, market value premium and the level of capital market development.[24] La Porta, Schleifer and Vishny

[24] Doidge, Karolyi and Stulz (2004b) show that more than 70% of the variation in the S&P Governance rankings is explained by country characteristics. Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001) find that country factors are more important in explaining capital structures in emerging countries than firm-specific variables.

(1998) document that countries with common-law legal systems provide a greater level of investor protection, compared to civil law countries with German, Scandinavian, and French legal systems.[25] They also find that ownership concentration is higher in countries with weaker investor protection, and that German and Scandinavian civil-law countries have the best quality of law enforcement. In countries where securities laws offer investors better protection, stock markets tend to exhibit greater stock liquidity, while countries with poor legal protection tend to have illiquid markets and a concentrated ownership structure. La Porta et al. (1998) test for inter-country differences in anti-director rights, creditor rights, law enforcement and ownership structure, and find that the concentration of share ownership in the largest public companies around the world is negatively related to investor protection. They measure legal protection in different countries by an aggregate index of various investor rights. These rights include the voting mechanism of ordinary shares, the ability of shareholders to mail their proxy vote to the firm, preemptive rights to buy new issues of stock, the ability to challenge management decisions by minority shareholders, who hold less than 10 percent of equity capital, and the percentage of share capital needed to call an extraordinary meeting. An index of antidirector rights is formed by adding six factors associated with minority shareholder protection, and it ranges from zero to six. La Porta et al. (1998) also create an index of creditor rights by adding such factors as the existence of creditors' consent for reorganization, the ability to gain possession of the security after reorganization, preference to secured investors, and the inability of the

[25] Licht (1998) provides an excellent historical comparison of the two systems, going back to the time when the distinction between private and public law, widespread in continental Europe, was unknown in England and America.

debtor to retain the property pending reorganization. The index ranges from one to four. The indexes of antidirector and creditor rights have been widely used in subsequent research.[26] Other significant country variables, introduced by La Porta et al. (1998) as proxies for law and contract enforcement, include efficiency of judicial system, rule of law, corruption and bribes, risk of expropriation by government, regulation of contracts, accounting standards, GNP and GDP per capita, and Gini coefficient. Most of these variables are taken from the International Country Risk (ICR) guide, while the efficiency of judicial system is computed by the country-ranking agency Business International Corp.

In a related study Reese and Weisbach (2002) show that firms from a French civil law system are more likely to list on a major stock exchange than firms from a country with an English common law system. While La Porta et al. conclude that ownership concentration serves as a substitute mechanism for poor investor protection in countries with civil law system, Reese and Weisbach consider ADRs as a special case of cross-listing and find that firms use them as partial substitutes for weak legal institutions. They find a large increase in the value and number of equity offerings following a cross-listing in the U.S., more so for firms with strong shareholder protection. Subsequent equity offerings outside the U.S. are issued mostly by firms with weaker shareholder regimes. In addition to the antidirector rights index and the legal origin of firms, Reese and Weisbach use a dummy variable for emerging market companies, and find that they tend to avoid listing on major U.S. stock exchanges.

[26] LaPorta, Lopez-de-Silanes and Shleifer, 2006; Doidge, Karolyi and Stulz, 2004; Reese and Weisbach, 2002.

Doidge, Karolyi and Stulz (2004) also use several variables developed by La Porta, Shleifer and Vishny (1998). They connect legal origin, antidirector rights, accounting standards, ability to access capital, liquidity, and judicial efficiency to market value, measured by Tobin's Q. They find that firms from French and Civil law systems have lower market values, and that Tobin's Q increases with the level of accounting standards, the liquidity of domestic market, and judicial efficiency. They also argue that firms with growth opportunities cross-list in the U.S. to protect the interests of their minority shareholders. According to Reese and Weisbach (2002) such a cross-listing facilitates a subsequent equity offering to finance future growth opportunities.

La Porta, Lopez-de-Silanes and Shleifer (2006) use an extensive list of country variables, utilizing prior research, and adding disclosure requirements, liability standards, investigative power, and criminal indexes to their study. They find that private enforcement of securities laws benefits stock market development more than public enforcement, and that countries with strong reliance on private contracting and litigation have more developed financial markets.

My research is closely connected to La Porta et al. (1998, 2006), Reese and Weisbach (2002) and Doidge et al. (2004). However, these studies ignore companies that are domiciled in Central Europe and Russia due to the lack of comparable and reliable data that makes it difficult to assess the level of shareholder and creditor protection in the region. This research remedies that void by using the World Index, developed by the Fraser Institute. The Fraser this index compiles time-series data of several country variables such as government intervention in the economy, access to

sound money, openness towards foreign investment and international trade, and labor market regulations, in addition to the efficiency of the legal system for countries in Central Europe and Russia. It uncovers the importance of monetary system stability, openness of international trade and the size of the government sector for the cross-listing decision of firms from Central Europe and Russia.

3.3. Reputational bonding

Another related strand of literature tests the implication of Coffee's (1999) argument that the SEC and other regulatory institutions can rarely effectively punish foreign firms that engage in expropriation of minority shareholders.[27] Licht (2003) states that the efficiency of regulations placed on foreign issuers in the U.S. is crucial, since a regulation loses its effectiveness without the ability of the legal system to enforce it. Coffee (1999) argues that "a firm that today enters the U.S. market becomes subject to the Foreign Corrupt Practices Act (1977), which precludes not only bribes and questionable payments, but all forms of off-book accounts and falsification of accounting record".

Reese and Weisbach (2002) claim that U.S. securities laws inhibit potential agency problems for foreign issuers of securities. A listed ADR requires a foreign firm to disclose all shareholders who own above 10% of shares and to follow U.S. disclosure and procedures whenever it decides to make a tender offer for another firm. Firm's insiders become liable in court for any fraudulent statements they make. Further, the Sarbanes-Oxley Act of 2002 added additional legal responsibility to companies that list

[27] Coffee, 1999; Reese and Weisbach, 2002; Licht, 2003; Siegel, 2005.

capital-raising ADRs. The statutory provisions in the act require independent audit committees, executive certification of financial statements, and increased disclosure of all off-balance sheet transactions. These provisions also restrict companies' purchases of non-auditing services from current auditors and prohibit corporate loans to officers. There is a potential antifraud liability under Rule 10b-5, which gives shareholders the right to sue for losses incurred from fraudulent statements made by the company insiders.

On the other hand, Licht (2003) and Siegel (2005) provide evidence that the impact of increased disclosure is mitigated by the fact that the SEC is unlikely to prosecute foreign companies. Licht (2003) argues that the Sarbanes-Oxley Act has caused only minor changes with regard to foreign issuers' disclosure. He lists a handful of exemptions applied to foreign issuers by the SEC. For example, the acceleration of periodic report filing dates by large companies under Section 16(a) of the SOX, does not apply to foreign issuers. Moreover, the U.S. regulation relaxes the provisions about self-dealing for foreign issuers, who are required to register on Form 20-F with the SEC. It has several exemptions from disclosure requirements of the U.S. issuers under form 10-K. For example, Form 20-F permits foreign issuers to disclose aggregate compensation, including stock options, without breaking it down by individual directors. Foreign firms are also exempt from disclosing data concerning material transactions with officers and directors. Further, foreign issuers only have to disclose shareholders with more than 10% of voting shares while the corresponding threshold for U.S. issuers is 5%. Foreign issuers can file an annual report within six months after the end of fiscal year, compared to 135 days extension for domestic issuers. Siegel (2005)

indicates that the SEC has adopted a "hands-off" approach towards foreign issuers. Since the enactment of the Sarbanes-Oxley Act in 2002, he finds virtually no reports regarding public enforcement steps by the SEC, even when misconduct was involved and had been publicized in the issuer's home country.

Coffee claims that during a market crisis, insiders would not engage in large-scale self-dealing or asset-taking if they had already bonded themselves with outside investors through a listed ADR. Siegel (2005) examines the sample of all Mexican firms listed on the Mexico Stock exchange prior to September 1994. He analyzes firms that were engaged in asset expropriation in the form of loans to private entities or balance sheet mismanagement between January 1995 and December 1999, and looks at the actions of SEC against them. The illegal governance abuses largely took place in public view with the firm's insiders fleeing the country. Siegel argues that U.S. governance rules for cross-listed foreign firms are stricter in writing than they are in practice, since he fails to find any legal SEC actions taken against them. He then examines firms that raised new capital after the crisis, both in domestic and international equity markets, as well as debt markets and finds that firms that did not experience any corporate governance scandal were able to gain privileged access to the global capital markets. Contrary to this finding, international markets cut off all new financing for cross-listed Mexican firms whose insiders were accused of large-scale asset-taking. This suggests that market incentives lead firms to follow rules that they were not forced to follow. Firms involved in scandals faced reputational penalty from the markets far more severely than punishment from legal institutions. Siegel (2005) concludes that reputational bonding works even without U.S. law enforcement. The theoretical

foundation for reputational bonding was first suggested by Diamond (1991), who documented that good insider behavior allowed firms to gain a reputational asset in the form of privileged access to scarce outside capital. Gomes (2000) develops a formal theoretical reputational bonding model in which insiders have a personal financial incentive, in terms of an increase in the stock price, to build and protect their reputational asset.

Eun and Sabherwal (2003) argue that bonding and market integration might not be mutually exclusive motives for cross-listings. Imperfect and segmented domestic capital markets can force firms to seek financing abroad. Over time, as market barriers disappear and national securities regimes converge, firms might cross-list to create positive market reputation. This possibility of simultaneous motives for cross-listings is tested by Lee (2003) through the analysis of spill-over effects on domestic companies. He measures the share price reaction of an ADR announcement on rival non-ADR firms, hypothesizing that a positive return on competitor firms can be seen as evidence of market integration, and a decrease in perceived risk, which is now being shared globally. However, Lee (2003) finds evidence of a negative return and interprets this as evidence of the inability of non-ADR firms to bond themselves with the U.S. legal regime. As more data becomes available, it will be interesting to perform a spill-over study of DR listings on domestic firms in Eastern Europe and Russia, since the evidence there is mixed.[28]

As noted on the onset, my research expands on prior literature on cross-listing in several ways. First, it considers a new sample of firms domiciled in the Czech

[28] Fernandes (2003) find positive impact of ADR issues on local firms; Melvin and Valero-Tonone (2003) employ a different measurement procedure to find a negative adverse spill-over effect.

Republic, Hungary, Poland and Russia that issued a Depositary Receipt, and those companies that chose not to cross-list. Second, it looks at the impact of country variables on firm market value and likelihood of cross-listing. The rest of this research examines the share price reaction to the listing of Russian and Central European DRs, market value premium of cross-listed versus non-DR companies in the region, and connects valuation and the probability of cross-listing to macroeconomic country variables.

CHAPTER 2. STOCK PRICE RESPONSE TO A DEPOSITARY PROGRAM

Studies of market segmentation address local stock market reaction to a depositary program. Miller (1999) and Foerster and Karolyi (1999) employ the event study methodology to examine abnormal stock returns around DR announcements and listing dates, respectively. They report a positive and statistically significant response to cross-listing, which is more pronounced for exchange listed receipts and for programs originating from emerging markets. In addition, Foerster and Karolyi (1999) report a larger post-listing share price reaction for emerging market firms and for capital-raising DR programs. One obvious drawback with these two studies is that they exclude transitional economies from their emerging markets sample due to a lack of reliable data.

Several prior studies that focus exclusively on Central European and Russian companies include Black (2001), Goetzmann, Spiegel and Ukhov (2002), Korczak and Bohl (2005) and Black, Love and Rachinsky (2006). Korczak and Bohl (2005) investigate the share price response to a DR listing by the 33 largest Central European firms domiciled in Hungary, Czech Republic, Poland, Russia, Slovakia and Slovenia, and report positive cumulative abnormal returns around the listing day. The remaining studies examine the impact of the corporate governance regime in Russia on share prices and the value of local firms. Black (2001) finds a strong correlation between the "value ratio" of actual to potential firm capitalization and governance rankings provided by two investment banks for a sample of 21 firms domiciled in Russia: a worst to best governance improvement, results in a 700-fold increase in firm value. Black (2001) conducts a separate analysis of firms with ADRs, with a surprising positive effect of the

ADR absence on firm value. He attributes the result to the fact that most ADRs in his sample are unsponsored and non-capital raising with no reporting requirements for the firm. He also noted that one should heed caution in the interpretation of his results due to the limited sample size. Black, Love and Rachinsky (2006) expand the sample employed by Black (2001) to include 99 Russian firms and six different corporate governance indices, and find that a two standard deviation increase in the combined governance index predicts a 0.14 increase in Tobin's Q, or about a 21% increase in share price. Black et al. (2006) do not consider the ADR indicator as a control variable in their analyses. Goetzmann, Spiegel and Ukhov (2002) document improvements in the corporate governance of Russian companies over the period of 1999-2002, and suggest that governance might account for price differences between Russian preferred and common shares.

To date, there are few comprehensive studies of Russian cross-listed companies and this research proposes to rectify these shortcomings. The purpose of this chapter is to examine the effect of cross-listing on the share price and return volatility of 16 Russian companies that issued an ADR. First, it presents an overview of the financial and institutional constraints that firms face in the domestic market in Russia. Second, it provides case studies of Russian blue-chip companies in the oil and gas sector. Finally, this chapter compares share returns and volatilities before and after the ADR listing date.

I. Financing Needs of Russian Companies

Since 1995, large-cap companies domiciled in Russia use depositary receipts as a tool to raise global investor recognition and obtain financing, which is often limited and expensive in the local market. This became possible when large-scale privatization of state enterprises went underway in Russia in the 1990s.[29] Companies in the oil and gas sectors, telecommunications and manufacturing could afford a cross-listing because new securities regulations went in effect, which ended the ban on foreign currency transactions and foreign ownership. Up to this date however, certain strategic sectors of the Russian economy, such as natural resources and information technology, had to maintain a minimum 51% government ownership stake.

Following currency devaluation in Russia in 1998 most Russian industrial enterprises have been taken over by large holding companies, which provide financing conditional on changes in management structure. Clarke (2004) shows the impact of financial-industrial group ownership on enterprise performance in Russia over the period of 1998 to 2003. The holding group control results in the centralization of the functions of sales, marketing and finance within the group, and in delegating production and sales to a subsidiary. The Russian oil and gas sector is an example of a vertically integrated holding structure. The industry leaders, Lukoil and Gazprom have the centralized management, where target sales figures are handed down by the holding company to the subsidiary. The holding company is viewed as a benefactor, which provides working capital and investment funds, and most importantly is engaged in

[29] Claesens, Djankov and Klingebiel (2000) emphasize the positive role of privatization for stock market development in transition economies. Black, Kraakman and Tarassova (2000) find evidence of self-dealing on the part of managers and controlling shareholders during mass privatization of large Russian firms, and emphasize importance of monitoring mechanisms in privatization process.

lobbying the federal government on behalf of the company.[30]

Another feature of Russian enterprises is the reliance on equity financing, partly due to underdeveloped market lending mechanisms and the unavailability of corporate credit ratings. Parker (2002) reports that the average debt-to-assets ratio of publicly traded Russian firms in 2001 is 11.96%, compared to 23.9% in Europe and to 19.8 % world average. Over the past five years, the legal infrastructure has been developing to allow consumer lending and mortgage lending, with first attempts at corporate level securitization.[31] For example, securitizing part of its liquid assets and borrowing against its future sales revenue allowed Russian gas monopoly, Gazprom, to obtain a lucrative $1 billion loan to finance its gas pipe expansion into Western Europe in 2004. Several obstacles to this type of financing lie in the Russian legal system, which create uncertainty on how the courts might interpret concepts of bankruptcy remoteness, true sale, and special purpose vehicles that are used in securitization contracts. While under the common law legal system these structures are based on complex principles of jurisprudence, the Russian legal system, which has its routes in German civil law, is still at an early stage of development with few efficient enforcement mechanisms in place. This does not prevent securitization, but makes conflict resolution and contract enforcement much more difficult. As emphasized in La Porta et al. (2006), law matters for financial development, and private monitoring and public enforcement of contracts are extremely important in the operation of efficient capital markets.

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[30] This situation can serve as yet another example of the "twin agency" concept, introduced by Stulz (2005), where the firm management and the state collude in expropriation of minority investors.

[31] Bartlam and Artmann (2006) report that although consumer lending nearly doubled in Russia in the period from 2004 to 2005, it still accounts for only 5% of GDP; the same trend holds for mortgage lending, which grew six-fold during the same period, but accounts for only 1% of GDP. (Securitization sensation. *The Lawyer*. September 18, 2006. P.37-38).

High cost and often the unavailability of external funds in the Russian market during the 1990s spurred a widespread trend of non-monetary trade (NMT) between enterprises. Ivanenko (2004) documents the use of barter, and various debt clearing schemes that do not involve money, concluding that the shifts in the state policy, such as excessive state borrowing, a weak banking system, and inflationary expectations contributed to the rise of NMT transactions in Russia. Gaddy and Ickes (2002) argue that a large part of profits from competitive firms are being redistributed through barter transactions to less competitive subsidiaries, partly to hide revenues and avoid excessive tax burden. For example, trade partners in the same technological chain, such as a coalmine or a power station, exchange receivables for payables through pure bookkeeping operations that leave their bank accounts unaffected. Parker (2002) reports a large gap of average accounts receivable for Russian companies compared to similar averages in Europe and around the rest of the world, indicating the inability of Russian companies to meet their financial obligations on time. It takes on average days 125.62 days to close accounts receivables in Russia, while it takes 84.28 days to pay accounts receivables in Europe and 102 days in the rest of the world.[32] Non-monetary trade has served as a tool to alleviate the burden of large accounts receivable: the proportion of NMT to total assets increased from 7% in 1993 to 50% in 1998, when the Russian federal government defaulted on its debt, and the rouble was devaluated.

Gurkov (2004, 2006) conducted a series of large scale surveys of CEOs of Russian industrial companies. The first round of surveys covered 740 CEOs, who in October through December of 2000 were sent questionnaires to respond to. In total, 735

[32] Parker M. (2002). The economic competitiveness of Russian Federation: Financial Returns, Labor Productivity and International Gaps. ICON Group, INSEAD.

questionnaires were collected, and a second survey resulted in 1,431 responses. One of the findings of these surveys is that getting financing for a new project and mastering new distribution channels are the most difficult stages of any innovation process in Russia: 50.7% of respondents noted that financing constraints were extremely relevant. Besides the lack of finance, the inflexibility of local business networks, the weakness of external systems for innovation, the absence of state support, underdeveloped financial and legal infrastructure, corruption and a low level of legal enforcement create impediments toward the financial development of Russian enterprises. Durnev and Kim (2005) indicate that although the "de jure" measure of anti-director rights in Russia is equal to 5 out of 6, investor rights are not effectively enforced. The "de facto" strength of the rule of law and order is assessed on a scale of 0 to 10 by the International Country risk guide, and Russia receives a miserly score of 5. The overall legal regime index for Russia is therefore only 25 out of a possible 60.[33]

The picture for Russia is not entirely grim. There is a visible presence of innovative companies, which constitute 15-30% of all large and medium-sized firms in the economy.[34] After the financial crisis in 1998, domestic manufacturers started to recover and invest more in technology, facilities upgrades and capacity expansions to meet increasing consumer demand. This increase in domestic demand is due to steady 6% annual real GDP growth in Russia in 2006-2007, which exceeds 2% in the Euro area (see Figure 2.1). In 2005 per capita average monthly income in the Central, Ural and North-West regions of Russia was $360.54, $323.08 and $292.52, respectively

[33] Durnev and Kim (2005) construct the *LEGAL* index by multiplying two measures of market regulation: anti-director right and rule of law.

[34] Gurkov, I. (2004, 2006).

(reported in Table 2.1). The cultural and political centers of Moscow and St.Petersburg account for income growth in the Central and the North-West regions, while steel and auto-manufacturing industries contribute to the growth of the Ural region.

These recent positive trends in consumer demand and income per capita growth allow a growing number of Russian firms to overcome local constraints. As was mentioned in the introduction, the two main ways to escape a poor legal environment and to improve the firm's market value in the emerging market setting are the cross-listing and the adoption of better corporate governance standards. The link between market value and corporate governance has been established in several cross-sectional analyses (Durnev and Kim, 2005; Klapper and Love, 2004) and in the studies of single emerging countries like Russia (Black, Love and Rachinsky, 2006; Goetzmann, Spiegel and Ukhov, 2002; Black, 2001; Black, Kraakman and Tarassova, 2000). Another strand of the cross-listing literature examines the bond between market value and cross-listing (Doidge, Karolyi and Stulz, 2004; Hail and Leuz, 2006; Reese and Weisbach, 2002; Karolyi, 2004). This research expands the previous work by analyzing the link between market value of the firms, domiciled in countries with weak legal shareholder protection, such as Russia, and the cross-listing decision as means of overcoming local financing constraints.

Prior studies on cross-listings also show that the location of listing and its geographical proximity to the domestic market plays an important role in firm valuation.[35] Pagano, Roell and Zechner (2002) report that newly privatized high-tech European companies with high levels of leverage tend to list on U.S. exchanges, while

[35] Pagano, Roell and Zechner (2002), Sarkissian and Schill (2004).

mature companies that do not rely heavily on export sales tend to list in the proximity of their European domicile. Sarkissian and Schill (2004) find support for the proximity preference argument, citing investor familiarity with culture and legal institutions.

Russian companies have closer geographical ties with financial centers in London, Luxembourg and Frankfurt, rather than in New York.[36] This is reflected in the number of Russian DR listings on the European exchanges versus listings on the NYSE, NASDAQ and the AMEX. The London Stock Exchange has 18 Russian depositary listings, while there are only 6 DRs traded on the NYSE. Since 2000, Russian companies have raised $24.6 billion in equity sales on the LSE, with the latest Level 1 GDR issue of $10.66 billion made by the Russian oil company Rosneft in 2006.[37] The majority of the Russian DRs are traded over-the-counter (OTC).[38]

Next, a summary of recent trends in the Russian oil and gas sector is presented. The latter part of this section explores the impact of depositary receipts issue on share prices and liquidity for each firm by industrial sector.

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[36] As Russian wealth shifts to London, cultural ties with the U.K. continue to grow. For example, the governor of one of the emerging regions in Siberia, Abramovich, purchased the top London soccer team, Chelsea. Russian businessmen alike make a contribution to London's elite real-estate market, buying one out of five properties priced above $11.9 million. (Mollenkamp, C. and Patrick, A. "British Spy probe turns to émigrés: Investigators find London draws Russians of wealth and with ties to home". *Wall Street Journal.* Page A6. December 5, 2006).

[37] Chazan, G. "Fueled by Oil Money, Russian Economy Soars". *Wall Street Journal*. Page A1, March 13, 2007; Neville, L. "Rosneft IPO leaves questions unanswered". Global Finance. Page 8, September 2006.

[38] The Bank of New York (BoNY) provides a complete list of depositary receipts at www.bankofnewyork.com/adr, with 147 issues from Russia as of May, 2007.

II. Overview of the Russian Oil and Gas Industry and its Leaders

The oil and gas industry is critical to the overall economic development of Russia. It accounts for roughly 45% of Russian exports and for 30% of the state budget revenue (Nakamura, 2004). Prior research has shown that Russian oil and gas companies earn large profits but fail to invest in the local infrastructure and facilities, which are usually obsolete (Considine and Kerr, 2002; Kuboniwa, 2002; Cukrowski, 2004). Instead, they invest large amounts of their funds in foreign financial assets, which leads to foreign flight. As a consequence, the government fails to capture oil and gas revenues adequately. Gray (1998) estimates that the budget revenue from the oil and gas industry in Russia is only half the level it should be when compared to other countries. The current oil taxation system is revenue-based, rather than profit-based, and includes around 30 different federal and local payments. During the 1990s, the average tax burden to the oil and gas producers exceeded 50% of gross revenue, however after currency devaluation in 1998 the burden decreased to 35% of the gross revenue of the sector. Nakamura (2004) compares the oil and gas sector to the rest of the Russian economy, and concludes that capital flight is common in all competitive sectors. Thus, redistributing oil revenue to other industries will not fix local investment trends. Cukrowski (2004) argues that the government should shift from fiscal actions to long-term policy and capacity upgrade in the country's strategic sectors, and acknowledges that this is a "big challenge", given the recent events related to Yukos.

The industry structure of the Russian oil and gas sector has witnessed change from one that was centrally planned and based solely on state ownership to one that is vertically integrated and privately-owned, with divisions comprising extraction and

refining (or upstream activities), and transport and sales (or downstream activities). The existence of huge oil and gas resources is offset by problems, such as difficult climate conditions, uneven distribution of industrial assets, and large transportation costs.[39] Russia spends four times as much on energy as Germany and eight times as much as the United States to heat a unit of housing space. Construction costs are two to three times as high as those in Western Europe. Transportation costs account for 15-20% of Russia's production costs, compared to 7-8% in other advanced economies, and oil production costs in Iran, Iraq, Saudi Arabia, and Kuwait average below $2 per barrel, in Libya, Venezuela, Abu Dhabi and in non-OPEC producers such as Mexico, Oman, and Malaysia they average below $5 per barrel, while in the United States (in the Alaska fields) and Russia they average $10 per barrel. Considering that OPEC countries accounted for only 42% of global oil production in 2005, Russia has somewhat of a competitive position to maintain and duly expand in the global market.

Another feature of Russia's fuel and energy sector is that domestic prices of natural gas and electricity, as well as transportation tariffs for some energy commodities are strictly regulated by the government. In the short term, such regulation can control sharp price raises, counteract inflation, stabilize personal incomes, and support the competitiveness of Russia's industries and agriculture. In the long term however, it might impede investment in the sector. Cukrowski (2004) documents that by the end of 2000, domestic crude oil prices in Russia reached only 33% of the world level, and domestic petroleum prices were at 75% of the world level.

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[39] Russia leads the world in terms of per capita reserves of crude oil and natural gas. The oil reserves estimates vary between 10 to 20 billion tons – enough to keep production at the current level for 22 to 45 years. As for natural gas, Russia has reserves of about 47 trillion cubic meters, enough to sustain current-level production for 75 years.

The Russian government regards energy as a key strategic resource and a source of geopolitical influence. The recent high-profile case of Russian government pressure on Royal Dutch Shell is a sign of concern for foreign investors. Shell is on the verge of handing majority control of its $20 billion energy project in remote Sakhalin Island to Russia's state-controlled company Gazprom. Some analysts argue that the legal concerns raised by the Sakhalin case cast a shadow over all agreements in Russia. To invest in large Russian energy projects, foreign investors need to team up with a government-approved partner. In the future, that's likely to mean either Gazprom or Rosneft, Russia's two state-owned energy companies.

Key financial results in the Russian upstream sector fell short of market expectations in 2005. Analysts reported that total crude oil production of listed Russian second-tier companies, such as TNK-BP, Surgutneftegas, and Tatneft increased by only 0.3% in 2005. The Russian downstream oil sector, on the other hand, showed improved production and financial performance in 2005. On average, listed Russian downstream companies increased their refining by 5.3% due to modernization and high capacity usage rates. The trend is expected to continue to improve in 2006 and beyond. Most Russian refineries operate tolling systems, with the share of tolling in total revenues of about 90%. More specifically, they do not buy crude oil and sell products, but take a fee for carrying out a refining service for other parties. In the current situation of high crude oil prices, tolling arrangements limit input costs in the overall cost structure of Russian refineries. They also raise prices for processing services by an average of 14%, with an increase of revenues and EBITDA by 165% and 146% respectively, and an increase in the net profit margin to 16% in 2005. This growth in refining margins is encouraging oil

and gas companies to increase the share of refining in their businesses. Lukoil, TNK-BP and Rosneft all declared such plans in 2005. In particular, Lukoil invested nearly $2.5 billion to modernize its refineries in 2006. Another reason for modernization of refineries is the rising demand for light grades of gasoline both in Russia and abroad. A gradual transition of Russian vehicles to European fuel quality standards is also forcing refineries to modernize, increasing their utilization rate and usage of cleaner high-octane oil products. Nakamura (2004) argues that although oil and gas companies are gradually increasing their investment in production capacity and refinery modernization, their investment in fixed capital is still considered insufficient.

A major development in the Russian oil and gas sector is the construction of the new Sever (North) oil product pipeline. Sever will connect two refineries owned by Lukoil to a port on the Russian Baltic coast and to European markets. The pipeline will significantly increase value and investment attractiveness of the two refineries. It is estimated that annual Russian product export volumes via the Baltic Sea could increase from 11-12 million ton in recent years to 20-30 million ton by 2010. Sever will transport diesel, gasoline and jet fuel to Europe.

Lukoil is the second largest private oil company worldwide, as measured by proven hydrocarbon reserves. It has around 1.3% of global oil reserves and 2.1% of global oil production. Lukoil's share in total Russian oil production is 18% and its share in total oil refining is 18.3%. Its main activities are exploration and production of oil and gas, production of petroleum products and petrochemicals, and the marketing of these products. Most of the company's exploration and production activity is located in Russia, and its main resource base is in Western Siberia, while retail activities are

focused in the international market. Its petroleum products are sold in Russia, Eastern Europe, CIS countries and the U.S.

Today, Lukoil is the only private Russian oil company dominated by minority stakeholders. The road to dispersed ownership was not altogether transparent. A recent investigation on the financial history of Lukoil has uncovered several accounting discrepancies and numerous off-shore funds set up by its former administrators. Nonetheless, with a DR listing in place, the company has greater exposure to global markets, and investors can gain access to more accurate information about the firm.

Lukoil stocks trade on the Moscow interbank currency stock exchange (MICEX) and on the Russian Trading System (RTS) between the $85-$90 range. Depositary receipts on Lukoil are listed on the Frankfurt Stock Exchange, the London Stock Exchange and over-the-counter in the U.S. on the New York Stock Exchange. In December 1995, Lukoil became one of the first Russian companies to place a Level 1 ADR in an over-the-counter (OTC) market. Each Lukoil ADR was issued against four ordinary shares in the U.S. OTC. In March 1996, a Rule 144a listing was established alongside the Level 1 ADR listing. In February 1997, the U.S. Securities and Exchange Commission approved an application for registration of a Level 1 ADR program for Lukoil preferred stock. Each ADR was issued against two preferred shares, which would account for 9.1% of Lukoil's equity. Russia's law on joint-stock companies gives owners of preferred stock relatively broad rights. In this particular case, Lukoil preferred investors would get an annual dividend set at 10% of the Lukoil holding company's net profits for the last financial year divided by the number of preferred shares. The 1995 dividend for Lukoil preferred stock was 150% more than the dividend

paid on its common shares. Preferred shares have a par value of 25 rubles, or around $0.91. They were first quoted on the Russian Trading System (RTS) on September 19, 1996, at $5.85. They closed at over $11.7 on the RTS on February 12, 1997, after the introduction of Level 1 ADR. The Bank of New York serves as depository for underlying shares.

In August 2002, Lukoil obtained a GDR listing on the London Stock Exchange. In London, Morgan Stanley acted as Lukoil's sponsor in relation to this listing, and GDRs began trading at $55.00. The demand for Lukoil securities underwent a 2.5-fold increase over the period from September 2002 to January 2003 and rose to $917 million as a result of greater transparency, an improved level of information disclosure and corporate governance standards. Lukoil GDRs account for 36.6% of the total trading volume of GDRs from Central and Eastern Europe on LSE in January 2003.

The last week of October 2003 saw the highest investor activity in connection with Lukoil GDRs. This demand was supported by the publication of favorable U.S. GAAP financial accounts for the second quarter of 2003 and by an improved credit rating awarded to the company by Standard & Poor's, which increased Lukoil's rating from BB- to BB. There was a 50% increase in the company's capitalization and a 60% increase in ADR trading volume over this time period. Lukoil's efforts to strengthen its financial standing and improve corporate governance also resulted in a Ba2 credit rating by Moody's.

On May 4, 2005, Lukoil announced that it was changing the ratio of ADRs from four ordinary shares to one share. The purpose of the ratio change was to create further liquidity and enhance the marketability of ADRs without diluting current holders value.

As a result of the ratio change, ADR holders of record on May 3, 2005 would automatically receive, on the distribution date, May 4, 2005, three additional ADRs for every one receipt already held.

Partly due to the success of the ADR program, and partly because of improved production capacity, Lukoil's 2005 financial results exceeded analysts' expectations. Revenues in the company increased to $40.6 billion, which was 66% higher than in the same period in 2004. Net profit amounted to $4.8 billion and EBITDA was about $7.7 billion, representing increases of 55% and 47% respectively over 2004. Lukoil's long-term strategy includes steady increase in oil output and a more rapid increase in gas production. The main Lukoil production region, Western Siberia, provides around 67% of the company's crude oil, and still has potential for growth in the levels of production. Lukoil also emphasizes development of international projects, which could provide up to 20% of total world production by 2014. Lukoil has set a target of increasing gas production to 50-60 billion cubic meters within 5 to 10 years. This rapid increase in gas production could be achieved by connecting its gas field to Gazprom's national pipeline system. Lukoil's business efficiency and transparency is being improved by its partnership with Conoco Phillips, which increased its stake in Lukoil to 20% via an open market purchase in 2006, despite high oil prices and a high valuation of Lukoil shares. [40]

Several factors contribute to the growth of the company's stock price and market value: solid position as the industry leader, large reserves, improved governance, investment in facilities upgrade, and expansion in overseas retail market. The ADR

[40] In focus: LUKoil. Russia's biggest oil company is becoming an influential player outside Russia's borders. *Business Eastern Europe*. September 18, 2006, page 7.

listing created an environment for greater investor awareness on Lukoil, and analyst following has increased dramatically since 1995, when the depositary program was just started.[41]

Clearly, the oil and gas sector is an important source of Russia's growth. The financial constraints faced by Russian enterprises apply to oil companies as well, but they are able to overcome local problems by cross-listing in markets with better institutions and governance structure. Although some foreign investors express concern about the sustainability of country's growth if oil prices drop,[42] others argue that this concern is less important, since the Russian natural resource sector is being challenged by food-processing and auto-manufacturing industries, which both increased their investment by 13.5% in 2006 - the highest annual rate since the 1990s.[43]

High GDP growth rates, fueled by positive developments in oil, gas, auto-manufacturing and food-processing sectors of the Russian economy, allowed the development of the DR market, with a growing number of large Russian firms seeking presence overseas. The next section of this chapter focuses on the share price response to ADR listing by 16 Russian companies. Return volatilities before and after the cross-listing are also compared across these companies.

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[41] Lang, Lins and Miller (2003, 2004) and Bailey, Karolyi and Salva (2006) show that the increased number of analysts following cross-listed stocks result in the improved accuracy of their forecasts, higher valuations, and the more volatile share price reactions around earnings announcements. Lang, Lins and Miller (2004) add that financial intermediaries provide the most value for firms that have the least protection for minority shareholders.

[42] Cukrowski (2004) indicates that a 10% change in international oil prices is associated with a 2.2% change in the level of Russian GDP.

[43] Lehane, M. "Open Season: Russia attempts to broaden its economic base away from resource-driven model are proving to be as profitable as they are successful". *Global Finance*. P. 42-46, April 2007.

III. Share Price Response to a DR listing

This section applies a standard event study methodology with an improved variance structure of market model returns to evaluate the share price response to a DR issue for a small sample of Russian companies.[44] The first requirement for a company to be included in the sample is the availability of local daily stock price data from DataStream. The BoNY database is therefore matched with DataStream, which provides local market closing daily prices for firms domiciled in Russia. Another requirement for a company to be included in the sample is an identifiable listing date. Following Foerster and Karolyi (1999), this section uses the actual ADR introduction date as the event date. The listing date marks the time when effects on the underlying stock can be realized through actual DR trading, and the information revealed in DR transactions leads to a more pronounced effect than the announcement of future trading opportunities.

Table 2.2 provides a description of the sample by type of depositary receipt program, industry, market capitalization and effective listing date. Two of the Russian DRs are traded on NYSE as Level 2 offerings, thirteen companies have issued Level 1 DRs, and one company is a private placement under Rule 144A.

The event study method uses stock returns to measure abnormal performance around a market event announcement or occurrence. Brown and Warner (1980, 1985), Corrado (1989) and Campbell and Wasley (1993) identify key benefits and shortcomings of the event study methodology, emphasizing that the normality of

[44] Brown and Warner (1980, 1985) examine properties of daily stock returns and influence of autocorrelation and heteroscedasticity on event study methodology. They show that the market model performs well under a wide variety of conditions.

abnormal returns is a key assumption underlying the use of parametric test statistics in event studies. Although, Brown and Warner (1985) find that the degree of non-normality in daily security abnormal returns poses little concern for correct test statistic specification in large samples, it may increase the probability of Type I error in studies with a small number of observations. Campbell and Wasley (1993) document a substantial degree of non-normality in the daily returns of NASDAQ securities that persists even at the portfolio level. As a result, the portfolio and standardized test statistics examined depart from their theoretical unit normal distribution under the null hypothesis. They find that the standardized test statistic rejects the null hypothesis too often in the absence of abnormal performance. Corrado (1989) suggests a nonparametric rank statistic that is less misspesified for skewed return distributions.

This section of research applies an event study procedure to a sample of sixteen companies, realizing that abnormal performance might be overstated due to a small sample size. A market model for each firm is estimated using local stock returns denominated in U.S. dollars. Local returns are computed as follows:

$$R_t = ln\,(P_t) - ln\,(P_{t-1}) \qquad (1)$$

where P_t is daily closing price.

With the listing date defined as day 0, the market coefficients are estimated in the pre-listing period over day –175 to day –26. This gives a 150-day window that can be used to estimate the market model. Fifty-one days surrounding the listing date are excluded to monitor the event. Campbell and MacKinlay (1997) note that it is typical for the estimation and the event windows not to overlap. This design ensures that parameter estimators of the return model are not influenced by event-related returns.

Including the event window in the estimation of the parameters of the market model could lead to event returns having a large influence on the parameter estimates. In this situation, both the normal and abnormal returns would reflect the impact of the cross-listing. This can be problematic because the event study methodology implicitly assumes that the event is exogenous with respect to changes in the market value of securities.

Abnormal returns in the event window are determined by the prediction errors from the market model. Coefficients from the pre-listing model are used to calculate abnormal returns over day –25 to day +25. Abnormal returns are then averaged across firms (average abnormal returns) and across time (cumulative abnormal returns).

This research uses a slightly modified covariance structure of returns allowing for heteroscedasticity and autocorrelation. Stock returns are modeled using the GARCH and ARCH-in-mean specification. Finance theory suggests that an asset with a higher perceived risk would on average pay a higher return. If I decompose the difference of the ex-post return and the risk-free rate into the unanticipated mean component and unanticipated error component, then theory suggests that the mean return will be a function of variance, and the residual return can be modeled as an ARCH-in-mean process (Campbell and MacKinlay, 1997).

The presence of heteroscedasticity in residual returns, if not explicitly accounted for can lead to inefficient parameter estimates as well as biased and inconsistent test statistics in many estimated asset-pricing models. Moreover, as noted by Giacotto and Ali (1982), standard event studies testing for the effects of firm-specific events on security prices must be modified if heteroscedasticity is present. Finally, Diebold, Lim

and Lee (1993) state that because excess unconditional kurtosis may be unrelated to conditional heteroscedasticity, examining time-varying volatility may shed light on the non-normality of stock returns, as well as on the convergence to normality under temporal aggregation.

In a GARCH model, the conditional variance of market model residual returns is permitted to move in an autoregressive fashion. The model in this section follows one introduced by Diebold et al. (1993). A market model with p^{th} and q^{th} order GARCH disturbances for a particular firm *i* is written as:

$$R_t^{\,i} = X_t^{\,i}\ \beta^{\,i} + \varepsilon_{\,t}^{\,i}, \qquad (2)$$

$$\varepsilon_t^{\,i} \mid \Omega_{t-1}^{\,i} \sim N\,(0,\ h_t^{\,i}) \qquad (3)$$

where $h_t^{\,i} = \alpha_0^{\,i} + \Sigma_j\, \alpha_j^{\,i}\, (\varepsilon_{t-j}^{\,i})^2 + + \Sigma_k\, \gamma_k^{\,i}\, (h_{t-k})$ is the conditional variance of the error term, $\alpha_0^{\,i} > 0$, $\alpha_t^{\,i} \geq 0$, $j=1, \ldots, q$; $k=1, \ldots, p$;

R_t^i is the return on the stock of firm *i* at time *t* (in U.S. dollars);

Ω_{t-1} is the information set that contains $\varepsilon_{t-1}^{i}, \varepsilon_{t-2}^{i}, \ldots, \varepsilon_{t-p}^{i}$; and t = 1, …, T indexes time.

The row vector X_t contains an intercept, the local market index return and the U.S. market index return. The Russian market index closing prices are obtained from DataStream International in U.S. dollars. The S&P 500 composite index return is used as a proxy for the U.S. market return. The U.S. return data are obtained from the CRSP database.

First, Lagrange multiplier (LM) and Portmanteau Q tests are conducted to check for heteroscedasticity in both sets of returns. The results indicate that the returns exhibit heteroscedasticity. A check is then conducted on the number of lagged error terms (*q*) in the variance of error term, and whether the unconditional variance depends on previous

variances (*p* order). The returns exhibit a GARCH (1,1) process.

The daily abnormal return for security *i* for day *t*, AR_{it}, is calculated as:

$$AR_{it} = R_{it} - (X_t^{\,i}\ \beta^{i}) \qquad (4)$$

where β^{i} is the vector of the estimated intercept and the coefficients for local market and U.S. market proxies from the market model (equation 2).

The daily abnormal returns are then averaged across N securities, weighted by company size, on day t to compute the average abnormal return:

$$AR_t = \Sigma_i\,(AR_{it}\,w_i) \qquad (5)$$

$$\text{where } w_i = \frac{\text{MarketCap}_i}{\Sigma_i\,(\text{MarketCap}_i)} \qquad (6)$$

is the weight of each company, based on its market capitalization in U.S. dollars.

To judge the statistical significance of the abnormal returns, the Dodd and Warner (1983) and Brown and Warner (1980, 1985) methodology is used to compute standardized abnormal returns and their test statistics. For each security *i*, the daily abnormal return AR_{it} is standardized by the square root of its estimated forecast variance to determine its standardized abnormal return:

$$SAR_{it} = \frac{AR_{it}}{s_{it}} \qquad (7)$$

$$s_{it} = \sqrt{\frac{s_i^2\,[1+\frac{1}{L}+(R_{mt}-R`_m)(R_{ust}-R`_{us})]}{\Sigma_{k=1}^{L}\,(R_{mk}-R`_m)(R_{usk}-R`_{us})}} \qquad (8)$$

where s_i^2 is the estimated residual variance from the market model regression for security *i*, R_{mt} is the local market return on day t, R_{ust} is the U.S. market return on day t,

$R`_m$ is the mean local market return over the L days used to estimate the regression, $R`_{us}$ is the mean return on the U.S. market index over the L days used to estimate the regression. For each day *t* of the event period, a test statistic Z_t is calculated:

$$Z_t = \Sigma_{i=1}^{N} \overline{SAR_{it}} \sqrt{\frac{1}{N}} \quad (9)$$

Cumulative average abnormal returns were calculated as follows:

$$CAR_{t,T} = \Sigma_{t=1}^{T} AR_t \quad (10)$$

where T is the number of days in the accumulation period.

Cumulative test statistics are calculated as follows:

$$CZ_t = \frac{\Sigma_{i=1}^{T} Z_t}{\sqrt{T}} \quad (11)$$

The event window extends from 25 days prior to the event day through 25 days after the event day. Next, the volatilities of stock returns pre- and post-ADR listing are compared. The window used for the pre-listing period is [-175;-26] days, and [+26;+175] days for the post-listing period, making the number of days in the market regression equal to 150 (L=150). Variance ratios are computed as:

$$\text{Variance Ratio} = \frac{\text{VAR after}}{\text{VAR before}} \quad (12)$$

If the ratio is greater than one, the variability of stock returns is said to have increased after the ADR introduction, and if lower than one, then the volatility of returns decreased after the cross-listing.

The results obtained from the model are presented below. One should observe at the onset that these results have to be interpreted with caution due to a relatively small sample size. The daily average abnormal returns (AR_{it}), and the cumulative abnormal returns for day -25 through day +25 after the listing date are presented in Table 2.3. On the listing day the local market exhibits a statistically significant negative average abnormal return of 1.045%. This result though surprising is similar to that of Lau, Diltz and Apilado (1994), who found a temporary negative valuation impact on the first trading date for a sample consisting of 346 U.S. firm stock listings on ten different stock exchanges. The cumulative average abnormal returns over the interval [-5, +3] days around the first trading day were negative, followed by a negative post-listing period return for firms listing on the Tokyo and Basel exchanges. Lau et al. (1994) attributed this result to the fact that a DR listing by a U.S. company is often placed in a market with a greater cost of capital than the U.S. market, yielding a negative reaction by U.S. investors. In the case of 16 Russian DRs, the negative return on the DR listing day might be explained by the nature of the Russian DRs, which are mostly Level 1 listings with limited information disclosure requirements. These types of issues generally result in a lower share price response than Level 2 and Level 3 issues (Miller, 1999; Foerster and Karolyi, 1998; Doidge, Karolyi and Stulz, 2004).

Table 2.4 presents average abnormal returns around the listing day by ADR type. Russian companies that list ADRs over-the-counter as pink sheets experience a negative market reaction with an abnormal return of -0.937%, as well as exchange listed ADRs with an abnormal return of –5.726%. These results are most likely due to liquidity and costs of ADR issues. The least costly pink sheets Level 1 ADRs provided

the most favorable local market response in the post-listing window from day +2 to day +25, with an abnormal return of 4.996%. This is a puzzling result, since liquidity and investor recognition hypothesis would predict that firms that list on PORTAL as Level 1 ADRs would get the lowest investor awareness and the smallest price response (Miller, 1999). Nonetheless, this finding might be attributed to the fact that local investors are seeking the cheapest way to access overseas markets, trying to keep issuing costs down.

Table 2.5 reports the analysis of return variance. The ratios in this table compare pre- and post-listing variance. The pre-listing variance includes [-175, -26] days before the listing. Post-listing variance includes [+26, +175] days after the listing. An examination of these results reveals that eleven out of the sixteen ratios exceed one, based on an F-ratio test of whether the variance ratio is equal to one. This result implies that eleven companies in the sample experienced a greater volatility of returns after the ADR listing (in comparison to before the listing) using domestic stock returns. The remaining five companies reported ratios below one, which represents a minor quandary. The increase in variance for the eleven companies is consistent with Freedman's (1989) information hypothesis, which postulates that an increased amount of information being revealed to informed investors both in domestic and in international markets after an ADR listing date leads to more trades being executed and a higher return variance. The remaining five companies present a fly-in-the-ointment, though Lau, Diltz and Apilado (1994) document similar results to those documented in my sample. Their tests for the equality of stock return variances between event periods and market model estimation periods also failed to reveal a definitive impact.

IV. Summary and Conclusions

This chapter investigates the local stock market response to a foreign listing by companies domiciled in Russia. The empirical findings in this chapter are supplemented with case studies on the oil and gas sector in Russia. The findings presented here indicate that the effects of an ADR introduction on the underlying stocks from emerging markets are mixed.

Using a standard event study methodology with a modified covariance structure of returns, Chapter 2 explores the hypothesis of the benefits of cross-listing for a small sample of Russian companies. Available data relating to stock prices in developing countries, and in particular in transition economies, are subject to shortcomings. I use the most recent sources to gather data, which are believed to be generally compatible to international accounting standards. The results of the research, however, have to be interpreted cautiously. In general, the empirical evidence provides little support on a favorable market reaction to ADR listing, with a significant negative abnormal return on the day of ADR listing.

This section attributes mixed results to information asymmetries of non-capital-raising DRs, described in detail in Chapter 1. Over-the-counter listings do not require adherence to GAAP standards of financial reporting, thus reducing the quality of new company information received by the market. Another possible explanation of mixed results lies in the recent literature on adverse spillover effects of cross-listings. For example, Karolyi (2004) finds that the quality of the local market is eroded after an increase in ADR activity. This finding is based on the evidence from 12 countries from Asia and Latin America. Levin and Schmukler (2006) examine cross-listing in 45

emerging countries and find a diversion of trading from local to international firms, and a decrease in liquidity and turnover for domestic companies. Claessens, Klingebiel and Schmukler (2002) show that these effects are more pronounced for firms in countries with less efficient legal systems and with less per capita income. Edison and Warnock (2003) find that cross-listings in the local market result in some foreign equity flows, but these flows are transitory.

Critics of globalization often express concern about increased volatility of stock markets, leading to unstable investment and consumption in local economies.[45] The argument in fact holds in this paper. Although the return volatilities did not change consistently for the whole sample, eleven companies experienced an increase in variability of local stock returns. The result can also be attributed to an increased degree of information transparency between the local and the U.S. markets, which is consistent with Freedman's (1989) private information hypothesis: an increase in variance is connected to more information acquired by informed traders after the cross listing date.

Thus, the positive effects of financial globalization are still limited. Stulz (2005) develops a model where predatory and contracting powers of state and corporate insiders collide to create agency barriers, which limit the effects of globalization. Country characteristics remain very much relevant even when international barriers to investment disappear. This idea is true in the case of the emerging economies of Russia and Central Europe. Although, neoclassical models argue that financial globalization is beneficial for aggregate economic welfare, this positive effect cannot take place in the absence of necessary institutional and legal frameworks. Chapter 3 expands along this line of reasoning, and the analyses incorporate country factors in five major areas,

[45] Prasad, Rogoff, Wei and Kose (2003).

including property rights protection, contract enforcement, monetary stability, banking system, and government intervention in the economy.

Since the objective of this chapter was to take a first look at the issue of cross-listing in Central Europe and Russia, it could not take into account many aspects that were beyond the scope of research. A further investigation of the cross listing effects will be possible when a more comprehensive data set on companies in this region is available from statistical offices in the transforming countries.

Chapter 3 of this research remedies some of the measurement and data issues that have plagued this chapter. First, the sample size is increased by adding companies from Central Europe. Second, the analyses go beyond historical daily price data to explore annual Tobin's Q as a valuation measure. This provides an opportunity to corroborate the event study findings on stock prices in this chapter, and incorporate firm-specific and country-specific characteristics in the analysis.

CHAPTER 3. VALUATION DIFFERENCES ACROSS DR ISSUERS

Economic and political country risks, as well as low corporate governance levels contribute to the market value discount of firms from emerging markets. Firms can adapt to poor legal and information environments by either implementing better governance and disclosure standards or by cross-listing in markets with higher transparency. Doidge, Karolyi and Stulz (2004) show that firms with cross-listed securities are valued more than their local counterparts, suggesting that one way to eliminate the market value discount is to raise equity in markets with higher levels of shareholder protection. Lang, Lins and Miller (2003) document that cross-listing in the U.S. improves firm's analyst following, forecast accuracy and information environment, which is associated with higher valuations. Another way to improve a firm's value is to adopt better corporate governance. Klapper and Love (2004) find that firm-level governance provisions matter more in countries with weak legal environment, and firms can partially compensate for ineffective laws and their enforcement by establishing good governance standards and providing credible investor protection. Durnev and Kim (2005) show that investment opportunities, ownership structure and external financing are related to the quality of governance, and firms with higher transparency rankings are valued more.

This section of research focuses on the cross-listing decision by firms from Central Europe and Russia and its effect on firm value. Ideally, I would examine the effects of governance and cross-listing but data on governance from this region is not readily available. Financial markets of the region are prone to problems of low liquidity, little levels of disclosure, and strong state regulation with little enforcement. They serve

as an example of financial development in the home market impeded by twin agency problems (the first agency problem arises between dominant shareholders and minority investors, and the second agency problem is between the state and minority shareholders).[46] Rajan and Zingales (2003) show how existing firms with government connections can use laws in their favor, hindering financial development of the newcomers in the market. Stulz (2005) emphasizes that in countries with a significant threat of expropriation, consumption of private benefits is implicitly subsidized by the state. He finds that insider ownership increases as the protection of minority shareholders becomes weaker and as a country's political risk goes up.

Twin agency problems have adverse effects on entrepreneurship, risk management decisions and firm value. As Stulz (2005) points out, financial globalization can break a vicious cycle and enhance value by enabling firms to access capital markets with better investor protection. Doidge, Karolyi and Stulz (2004) examines whether firms that cross-list in the U.S. can take advantage of better institutions, and they find strong support for this hypothesis. They report a large listing premium for firms that issue equity and depositary receipts in the U.S. relative to firms that do not.

This research goes beyond prior related literature on cross-listings in two main aspects. First, it uses a sample of firms from Central Europe and Russia, which were discarded from firm observations in previous studies. Second, while most studies use country-level variables obtained from LaPorta, Lopez-de-Silanes, Shleifer and Vishny

[46] Stulz (2005) introduces the concept of twin agency conflict, when corporate insiders are connected with the state and expropriate minority investors. One illustration of the second agency problem is the case of the Russian oil company Yukos, when the state as the dominant shareholder redistributed back-taxes, confiscated assets, and required bribes.

(1998), this section evaluates the relation between firm value and the likelihood of cross-listing, with novel data taken from World Index components of the Fraser Institute. Related research primarily uses legal origins, the index of anti-director rights, and the index of judicial efficiency, in cross-sectional value regressions.[47] The legal origin index assigns each country to one of four legal traditions: common law, French civil law, German civil law, and Scandinavian civil law. The anti-director rights index aggregates six different shareholder rights measures and ranges from 0 to 6, where a higher score indicates better legal shareholder protection. The index of judicial efficiency produces a rating from 0 to 10 on the efficiency and integrity of the legal environment as it affects business. La Porta et al. (1998) use averages of the indexes from 1980 to 1983. At that time most of the financial markets in Central Europe and Russia were closed to foreign investment, and firm-level data were unavailable. The World Index and its five components proposed for use in this research are updated annually by the Fraser Institute in Canada. The Fraser Institute produces risk rankings in country economic and political factors that are likely to affect firm value and the likelihood of cross-listing, including size of government; legal structure and protection of property rights; access to sound money; international exchange; and regulation of credit, labor and business. The following section discusses data selection, methodology, and results of country analyses on the cross-listing decision and its impact on firm value in Central Europe and Russia.

[47] LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1998); La Porta, Lopez-de-Silanes and Shleifer (2006); Doidge, Karolyi and Stulz (2004); Doidge (2006); Claessens, Klingebiel and Schmukler (2006).

I. Data and Descriptive Analysis

This section describes the data used in the research. The objective is to evaluate the impact of the cross-listing decision on corporate value using a sample of firms from emerging markets of Central Europe and Russia. Cross-sectional and time-series regression models correct for country, industry and firm characteristics, which are unique for companies domiciled in Central Europe and Russia, given their common socialist history. Firm and country variables on both domestic and international activities are needed; therefore I combine several sources of data, which include DataStream and the Bank of New York ADR division data.

The dependent variable, the market value of a firm, is measured by Tobin's Q, which is computed as the market value of total assets divided by their book value, following Kaplan and Zingales (1997) and Gompers, Ishi and Metrick (2003). To get the firm-level data, financial statements of the companies are obtained from the DataStream database. The market value of equity is the number of shares outstanding multiplied by the price per share adjusted for ordinary dividends. The book value of the firm's liabilities is the book value of total assets (Datastream item # 392) less the book value of equity (Datastream account item # 307).

Tobin's Q for company *i* in the sample is computed as following:

$$Q_i = \frac{(NOSH*PRICE) + BV(TA) - BV(E)}{BV(TA)} \qquad (13)$$

where *NOSH* is the number of common shares outstanding;

PRICE is the dividend adjusted closing price;

BV(TA) is the book value of total assets;

BV(E) is the book value of equity.

As a necessary condition, each company is required to have at least four years of financial data available from 2000 to 2003. No observations are discarded, since the data on Central European and Russian firms is very limited. That gives us a total sample of 166 firms from the region, and 644 firm-year observations.

Data on companies cross-listed in the U.S. were obtained from the Bank of New York (BONY) ADR division. The BONY dataset includes the name of each ADR issuing company, the trading symbol, the country in which they are registered, the ADR type, the primary exchange, the ADR listing exchange and the effective date of issue.

The descriptive statistics presented in Figure 3.1 reveal that Tobin's Q is related to the cross-listing decision. Figure 3.1 presents average Tobin's Q of firms with DRs and firms without a cross-listing. This comparison yields two interesting observations. First, before controlling for firm, industry and country characteristics, cross-listed companies have higher Tobin's Q than firms that chose not to issue depositary receipts, which indicates that domestic listing is associated with lower value, possibly created by inefficient local management. Second, the market value premium for cross-listed firms is the highest for firms in Russia, which has the least favorable country rating in the region.[48] This preliminary finding is consistent with related studies, which report that

[48] The Fraser Institute awarded Russia a country rating of 5.1357 out of a possible 10 in 2003 (more economic freedom leads to higher values in the index). Poland received a rating of 6.126, Hungary's rating was 7.3715 and the Czech Republic was rated at 6.8451. Durnev and Kim (2005) report the average CSLA governance rating for four countries in the region, with Russia receiving the lowest score of 15 out of 100, Poland a score of 37, the Czech Republic a rating of 51 and Hungary receiving a score of 52.

cross-listings from countries with greater investment barriers and higher post-liberalization growth rates have higher market value premiums.[49]

Table 3.1 reports comparative statistics for Tobin's Q and average sales growth across four countries in the sample. Overall, firms from Poland have the highest average Tobin's Q of 1.2067, followed by Russia with 1.1538, Hungary with 0.9336 and Czech Republic with 0.8751. Median values are lower than mean values, but the ranking of countries remains the same. Interestingly, firms from Russia have the highest rate of sales growth in the sample. Doidge et al. (2004) show that future growth prospects result in a higher market value premium for cross-listed firms. Preliminary statistics confirm that firms domiciled in Russia have the largest difference between market value of cross-listed and non-ADR companies, as well as the highest growth rates in the sample.

Table 3.2 presents further summary statistics on the sample. Poland accounts for the largest number of cross-listed and matching companies, namely 17 firms. It is followed by 11 firms domiciled in Hungary, 11 companies from Russia and 4 firms from the Czech Republic. Companies come from a diverse set of industries, as shown in Figure 3.2. Table 3.3 provides a breakdown of the sample by industry and country of origin. The range of operating activities is widely distributed: from food and beverages to the manufacturing of heavy industrial machinery. The majority of companies are manufacturing firms, with a total of 52 firms, half of which are domiciled in Poland. They are followed by 28 companies in the energy sector, 23 in financials, 18 in information technology, and 11 firms in the oil and gas industry. The energy sector primarily includes companies providing electricity and heat, and these are concentrated

[49] Miller, 1999; LaPorta et al., 2002; Doidge, Karolyi, Stulz, 2004; Doidge, 2004.

in the Czech Republic and Russia. Firms that belong to the financial and insurance industry are concentrated in Poland, which dominates the sample in the manufacturing and telecommunications segments. Russia is the leading country in the sample in terms of oil and gas production, and energy generation, while Hungary has a comparative advantage in chemical manufacturing. The remaining firms are distributed between the trade, pharmaceuticals, construction, mining, real estate and service industries.

Table 3.4 provides the allocation of DR issues by type, trading platform and country. Most of the companies placed Rule 144a ADR issues, which are traded among qualified institutional buyers (QIB) on the PORTAL system. Poland has fifteen ADRs in this category followed by 8 in Hungary, 4 in the Czech Republic and 2 in Russia.

II. Methodology

Prior studies have examined the valuation differences between ADR and non-ADR firms using pooled time-series and cross-sectional regressions with Tobin's Q as a dependent variable. Explanatory variables often include country-level indexes, for example the anti-director rights, efficiency of the judicial system and the index of accounting standards.[50] The studies also control for firm growth opportunities, capital market development and type of cross-listing. The choice of variables in this section is dictated by the literature on the determinants of ADR listing (for example, Doidge, Karolyi and Stulz, 2004; Durnev and Kim, 2005; Rajan and Zingales, 2003), and constrained in some instance by availability of reliable data.

[50] Claessens et al., 2006; La Porta, Lopez-de-Silanes and Shleifer, 2006; Doidge, Karolyi and Stulz, 2004; Lang, Raedy and Yetman, 2003; Lang, Lins and Miller, 2003, Durnev and Kim, 2005; Rajan and Zingales, 1998, 2003.

In order to address valuation differences of ADR companies against those firms who chose not to cross-list, this research generalizes the standard logit model, frequently used in valuation studies in finance and in the labor force participation literature. Lang, Lins and Miller (2003) provide an analysis of performance and analyst coverage of cross-listed versus non-cross-listed firms, using a logit model of cross-listing choice. Doidge, Karolyi and Stulz (2004) measure the difference in Tobin's Q between cross-listed and matching companies, utilizing logit regressions on the listing decision. This section of the chapter expands on the model of Hill (1983, 1984), which compares participation of women in the labor force in the U.S. and Japan, employing a dichotomous model with formal and informal labor sectors. Hill finds that most working women do not regard the choices as identical, and that Japanese women tend to choose informal sector employment, while the women in the U.S. tend to participate in the formal labor sector. This section modifies a labor market choice model to fit the firm's decision to cross-list.

The modified Hill model assumes that each firm may select between two mutually exclusive alternatives: listing an ADR (*indexed l*), and not listing an ADR (*indexed n*). The firm compares utility attainable given each alternative and selects the alternative that yields the maximum utility.

Let V_{ji} be the maximum utility attainable for company i if it makes a choice $j = l,n$ to list or not to list an ADR. This indirect utility function can be decomposed into a stochastic component (S) and a non-stochastic component (ε):

$$V_{ji} = S_{ji} + \varepsilon_{ji} \qquad (14)$$

where S_{ji} is the function of observable variables, and ε_{ji} is a function of unobserved variables. The probability that the i^{th} company selects the j^{th} alternative is then given by

$$P_{ji} = \Pr\left[V_{ji} > V_{ki}\right] \quad \text{for} \quad k \neq j, k = l, n \tag{15}$$

or substituting,

$$P_{ji} = \Pr\left[S_{ji} - S_{ki} > \varepsilon_{ki} - \varepsilon_{ji}\right] \quad \text{for} \quad k \neq j, k = l, n \tag{16}$$

The market value premium is based on the decision to pursue the j^{th} alternative to cross-list or not to cross-list. Suppose that Tobin's Q is a function of firm characteristics, measured by vector *X*, and an indicator variable *S* that takes the value of 1 if the firm issues a depositary receipt. Then, the valuation equation can be estimated:

$$Q_i = \alpha + \beta X_i + \gamma S_i + \varepsilon_i \qquad \text{(valuation equation)} \tag{17}$$

Firms decide whether to cross-list based on various country-specific factors, and this decision can be modeled as:

$$S_{ji} = \delta Z_{ji} + \eta_{ji} \qquad \text{(listing decision equation)} \tag{18}$$

$S_{ji} = 1$ for j=*listed*

$S_{ji} = 0$ for j=*not listed*

where Q_i is Tobin's Q, defined as the ratio of the market value to book value of the total assets; X_i is a set of proxies for growth opportunities, which include sales growth and industry indicator variables; S_i equals to 1 for a firm that issued an ADR, and zero for matching firms; and Z_i is a set of country variables, which affect the decision to cross-list. These control variables are discussed further below.

Similar to Claessens et al. (2006), Karolyi (2004), Doidge et al. (2004) and Lang, Lins and Miller (2003), the decision to cross-list is modeled as a function of

country-specific and firm-specific variables. As noted in prior studies, the scope and effect of country specific variables is important. However, literature on ADR valuation effects limits the scope of the country-specific variables to legal shareholder protection (such as rule of law, legal family origin, and anti-director rights index). To expand upon legal structure and the protection of property rights, this research adds macroeconomic variables (to control for their influence on firm value across countries), which include size of government, access to sound money, international exchange, and regulation of credit, labor and business, Studies by Rajan and Zingales (2003), Karolyi (2004), Claessens et al. (2006) have shown that financial development is correlated with greater cross-border equity flows, higher market capitalization, more cross-listings, greater turnover and higher growth opportunities, which in turn is related to corporate valuation.

Two problems that create difficulty in establishing causality in the models of cross-listing are endogeneity and selection bias. Prior literature notes that the valuation equation is subject to a potential endogeneity issue, since causality can run in both ways (i.e. from firm value to cross-listing decision and from a decision to cross-list to market value).[51] If the firm selects to issue a depositary receipt because of expected enhancements in market value, the ordinary least squares estimate of the premium will be biased. Endogeneity is addressed using an appropriate specification of instruments in the two-stage least squares model. The firm's decision to cross-list (S_i) is affected by Q_i. The simultaneous equation framework with the listing decision equation, where Z_i is a set of variables that affect the decision to cross list, assists in the elimination of

[51] Doidge, Karolyi and Stulz, 2004; Claessens, Klingebiel and Schmukler, 2006; Lang, Lins and Miller, 2003.

endogeneity issues. Vector *Z* includes several market development indicators published in the Economic Freedom of the World guide, 2005.[52] Section III of this chapter summarizes trends in the country variables.

Cross-listed companies also tend to self-select from a sub-population of higher valued firms that can afford a listing abroad. An estimate of δ in the listing decision equation can therefore suffer from an omitted variable problem, namely the impact of selection on the listing decision. Selection bias is often treated using the Heckman (1979) correction. Heckman's two-step method estimates the hazard rate, which is a measure of the odds of selection in a first step valuation equation, and then includes this estimate as one of the explanatory variables in the second regression. This estimate of the omitted variable λ_{ji} is usually called the inverse Mill's ratio.[53] In the first stage, a probit model is estimated on the decision to issue an ADR with data from all issuers and non-issuers, and the probability to cross-list (P_{ji}) is computed. Then, the estimates of P_{ji} are used to get λ_{ji} for each alternative. In the second stage, an OLS model on the valuation premium is estimated, including the inverse Mill's ratio as an independent variable to account for selection bias. The results of the Heckman model are reported in section IV.

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[52] This annual report is created by Gwartney, Lawson, and Gartzke (2005) at the Fraser Institute in Canada. The data can be found on the Fraser Institute website: www.fraserinstitute.ca.

[53] In the current case of a dichotomous model (*J*=2) the inverse Mill's ratio is computed as:

$$\lambda_{ji} = \left(\frac{-3}{\pi^2}\right)\left[\sum_{k \neq j}\left(\frac{P_{ki}}{1-P_{ki}}\right)\log(P_{ki}) + \log\left(P_{ji}\right)\right]$$

III. Control Variables

As noted at the onset of this chapter, prior studies have established a strong link between legal investor protection and company valuation. It might also be argued that additional country-specific macroeconomic variables, such as size of government, access to sound money, international exchange regime, and regulation of credit, labor and business are also important in explaining the valuation premium. For example, several economic and legal policy variables may potentially influence the openness of a country, and a firm's ability to raise capital locally, such as: rule of law, security of property rights, enforcement of contracts, monetary and price stability, free trade, open markets, and avoidance of excessive regulations, among others. The Fraser World Index quantifies investment barriers faced by 123 countries in four continents across the world.[54] The World Index is used in this research as a measure of the differences in country laws, their enforcement, economic and political factors that might influence a firm's decision to list abroad. The following section describes the two sources used to compile the World Index, and the five areas that comprise the overall Index.

The International Country Risk Guide (ICRG, 2005) is used as one of the key inputs to the World Index.[55] The ICRG contains country-specific information on 22 variables in three subcategories of risk. The composite country score is created by using risk assessment in political, financial and economic areas that might affect foreign and domestic investment. Political risk components include: government stability, socio-economic conditions, investment profile, internal and external conflict, corruption,

[54] The recent index and its components can be found on the Fraser Institute web-site: www.fraserinstitute.ca.

[55] Details on the International Country Risk Guide methodology can be found on www.ICRGonline.com.

democratic accountability, and ethnic tensions. Economic risk is assessed based on levels of GDP per capita, real GDP growth, and annual inflation rate. The financial risk rating depends on foreign debt as a percentage of GDP and as a percentage of exports, the current account balance, and exchange rate stability.

The second source used to compile the World Index is the Global Competitiveness Report (GCR, 2003). This report focuses on the use of technology, quality of physical infrastructure, skill of the labor force, and other factors influencing the attractiveness of a country for business activity. This is particularly important for emerging economies of Central Europe and Russia since they are viewed generally as a source of low-cost labor and natural resources. The GCR (2003) also provides information on legal structure, security of property rights, and the regulatory environment for 161 countries around the world.

The Fraser Institute combines these two aforementioned sources to develop an overall World Index. It measures the degree of economic freedom in five areas: size of government; legal structure and protection of property rights; access to sound money; international exchange; and regulation of credit, labor and business. Table 3.5 provides a summary of firm, industry and country variables and their definitions.

The size of the government sector is an important indicator on the state's involvement in the functioning of the economy, and is likely to affect the firm value premium. For example, Stulz (2005) finds that governments are eager to pursue their own interests at the expense of individual investors, limiting economic growth and financial development and leading to "twin" agency problems. The Fraser Institute measures government involvement in the economy by analyzing government

consumption, transfers and subsidies, share of goods produced by government enterprises and income tax rates. For example, high marginal tax rates that apply at relatively low-income levels are indicative of greater reliance on the state. Accordingly, countries with high marginal tax rates and low-income thresholds receive a lower rating by the Fraser Institute than countries with low levels of government spending, a smaller government enterprise sector, and lower marginal tax rates, who earn higher ratings in the Index. Table 3.6 shows that in 2003, the highest rating of 5.8 in the region was achieved by Hungary, followed by 5.5 in Poland, 5.4 in Russia and by 4.5 in the Czech Republic. The ratings data are available from the Fraser Institute, and for brevity are reported in a concise form in Table 3.6 (under statistics). Firms domiciled in Hungary operate in an environment that is least dependent on the government, which is confirmed by the Index score on state consumption of 13.7%. The ratio of government consumption to total consumption is the highest in the Czech Republic and amounts to 32.1%, and Russia reports the largest share of the government sector as a fraction of total investment (35%).

The variables evaluated in Area 2 of the World Index receive considerable attention in the law and finance literature as important determinants of the market value premium documented in firms domiciled in countries with weak legal shareholder protection.[56] Area 2 of the World Index focuses on rule of law, security of property rights, independent judiciary, and the impartial court system. Failure of a country's legal system to afford the security of property rights, enforcement of contracts, and mutually agreeable settlement of disputes undermine the operation of the economy.

[56] La Porta et al., 2002; Stulz, 1999; Coffee, 1999; Durnev and Kim, 2005; Doidge et al., 2004; LaPorta et al., 2006.

Poor performance in this area deters foreign investment and can lead to stunted economic growth. Thus, countries with low ratings will be unable to achieve and sustain high rates of growth, impeding the market value premium. Table 3.7 presents a summary of index ratings in Area 2 across countries. Hungary achieves the highest rating of 6.6, largely due to judicial independence and impartial courts, adequate protection of intellectual property and low involvement of military in politics. Russia receives the poorest rating of 4.7 in the legal bracket due to low judicial independence, corrupt courts, and rarely enforced intellectual property rights.

Area 3 of the World Index is devoted to monetary stability, inflation and the regulation of banks in offering saving and checking accounts in foreign currencies. These macroeconomic variables are likely to impact firm market value through country economic and political stability ratings. In order to earn a high rating in this area, a country must follow policies and adopt institutions that lead to low and stable rates of inflation and allow access to the services of foreign banks. Table 3.8 shows that Hungary has the highest rating of 9.5 among the four countries in the sample due to low annual inflation and freedom of citizens to open bank accounts in a foreign currency. Russia receives the lowest rating in Area 3 due to an extremely high standard deviation in annual inflation of 30.5% and annual inflation running at 13.7%.

Area 4 of the World Index is freedom to trade internationally. It has been shown that market openness, absence of investment barriers, overall cross-border equity flows and trading activity are positively correlated with the market value of cross-listed companies.[57] The components in this area are designed to measure a wide variety of restraints that affect international exchange: tariffs, quotas, hidden administrative

[57] Moel (2001), Karolyi (2004), Claessens et al. (2006).

restraints, controls on the exchange rate and capital. The regulatory items like trade barriers and capital market controls are based on survey data from the Global Competitiveness Report (2005). The other components in this area can be quantified objectively. In order to get a high rating in this area, a country must have low tariffs, a trade sector larger than expected, efficient administration of customs, a freely convertible currency, and few controls on the movement of capital. Table 3.9 shows that Hungary has the highest rating of 8.4 in international openness due to advances in the regulation of trade barriers, a large trade sector, reasonable restrictions in the foreign exchange market and low capital market controls. The lowest overall rating is awarded to Poland because of a smaller than expected trade sector and high restrictions in the foreign exchange market. Table 3.9 also provides background data on Area 4 countries. An inspection of this table reveals that Russia has the largest international trade revenues that amount to 5.8% of the trade sector, which are largely due to oil and gas exports, and is consistent with a current account surplus, reported in the World Economic Outlook (2005).

The fifth and final area of the World Index includes regulation of credit, labor, and business. It is well known that the burden of government regulations can interfere with a smooth and well-functioning capital market, and might therefore reduce corporate value as a whole in a country. Table 3.10 illustrates sub-components of this area and it should be noted that ten of the measures are based on survey data because of the difficulties involved in developing objective measures of regulatory restraints. The highest index of 6.6 in the region is, once again, attained by Hungary, which shows progress in legislating foreign and private ownership of banks, interest rate regulation,

and time spent on government bureaucracy. Poland and Russia are reported to have the highest burden of overall regulations with ratings of 5.3 and 4.8 respectively.

Table 3.11 reports the trend in the Index components. In 2003, the summary index was the highest in Hungary (7.3715), and the lowest in Russia (5.1357). Figure 3.3 shows how the World Index has evolved over time in Central Europe and Russia. Hungary shows the largest improvement over the course of four years: the Index of Economic Freedom went from 6.6 in 2000 to 7.4 in 2003. The Czech Republic indicators remained flat over this time period; Poland showed an increase in the Index from 5.8 in 2000 to 6.1 in 2003, while Russia remained below the rest of the region with a slight rise in the overall Index ratings from 4.5 to 5.14.

What does this mean for firm valuation in the region? Preliminary statistics have shown a tentative link between Tobin's Q and a decision to cross-list, with the highest market value premium realized for cross-listed firms domiciled in Russia. The current section documents that Russia has the lowest country score in the size of government sector, monetary policy, barriers to international trade, and labor regulation, suggesting a link between market value premium and country fundamentals. Claessens et al. (2006) argue that as country fundamentals improve, internationalization of financial activity accelerates, with better access to capital markets being influenced by investors' assessment of firms' home country environment. The following section of the research tests whether this is true for companies from Central Europe and Russia, and establishes which country characteristics matter most for valuation of the companies from emerging markets seeking presence overseas.

IV. Results

4.1. Cross-listing market value premium across countries

Preliminary statistics, as discussed in the previous section, indicate a tentative connection between firm market value and cross-listing decision. To evaluate this link for each country, Tobin's Q is regressed on a firm's cross-listing decision as the key independent variable, and the second component of the World Index, which measures the efficiency of legal shareholder protection in a country. The inclusion of the second explanatory variable is motivated by previous studies that show a positive effect of legal system on market value of firms within a country.[58] The prior studies indicate that the market value discount in companies domiciled in countries with weak legal investor protection can be overcome by cross-listing. Therefore, the analysis herein starts with regressing Tobin's Q as the dependent variable against legal efficiency and a cross-listing indicator as the independent variables. Other control variables, such as sales growth and the World Index components are gradually added in subsequent regression specifications.

All four countries in the sample have a positive cross-listing premium, as presented in Figure 3.4, which shows the coefficients of the cross-listing indicator and their t-statistics. The largest premium of 0.8064 (or 80.64%) with a t-statistic of 4.18 is documented for a sample of 31 Russian firms. The smallest premium of 18.26% (t-statistic is 1.91) is reported for 72 firms, domiciled in Poland. A premium of 23.1% with a t-statistic of 2.71 is found for 34 companies from Hungary. In contrast to Russia, Hungary and Poland, 29 firms domiciled in the Czech Republic have a statistically

[58] La Porta et al. (2002), Reese and Weisbach (2002), Rajan and Zingales (2003), Doidge, Karolyi and Stulz (2004), among others.

insignificant premium of 22.62% (the t-statistic is 1.54). Obviously, the level of statistical significance will depend on the number of ADR listings from each country. It would appear that the economic significance of the premium is correlated with the country ratings. It is worth noting that firms from Russia, the country with the lowest World Index score, realize the greatest premium across sample countries. This finding is consistent with prior literature that documents a higher valuation effect for cross-listed firms from emerging countries than for companies from more developed markets (La Porta et al., 2002; Doidge et al., 2004). Prior studies also show a market value discount for firms from countries with poor legal shareholder protection, however in my small sample of companies from Central Europe and Russia, the differences in legal regime are not as apparent as in broader cross-country studies. Therefore, it is unsurprising that the coefficient on legal efficiency is not significant for all the four countries. Nonetheless, in all the regressions I include this variable as a control.

Once the cross-listing premium for each country has been established, it is important to control for the various country, industry and firm-specific variables in the overall sample of 166 firms. I am interested to find out whether the premium remains positive and significant after controls, such as sales growth and industry indicators, are added. Table 3.12 reports the results of the regressions of Tobin's Q on control factors, the World Index of economic freedom and its components. Specification (1) describes how company value is influenced by the decision to cross-list and legal system efficiency for the overall sample of 166 firms from Central Europe and Russia. The listing premium is found by examining a coefficient of the cross-listing indicator, which is equal to 0.3322 (33.22%), and is significant with a t-statistic of 5.18, suggesting a

direct link between the decision to cross-list and the market value premium. Specification (2) indicates that better growth opportunities are translated into higher company valuation for our sample of 166 companies from Central Europe and Russia, with a coefficient of 0.2225 and a t-statistic of 2.68. Doidge et al. (2004) find a similar result for their large sample of cross-listed firms, which excludes companies from the transition economies of Central Europe and Russia.

The next specifications (3) – (5) of Table 3.12 add indicator variables for ten industries to control for industry-specific effects in the overall regressions. The coefficients of ten industry indicator variables are omitted from the Table 3.12 for brevity. However, an examination of these omitted coefficients in specifications (3) – (5) show that firms from information technology, oil and gas, pharmaceutical and real estate sectors seem to have higher Tobin's Q than their peers in other industries in the sample.

One primary objective of this research is to explore whether country characteristics, in particular the World Index and its components, are significant factors in market valuation for firms from Central Europe and Russia. In order to evaluate this impact, the next specification (4) of Table 3.12 considers the World Index of Economic Freedom as one of the explanatory variables. As noted earlier, the Index of Economic Freedom ranges from 0 through 10, with higher values indicating higher levels of economic independence. The coefficient of this variable in regression (4) is negative -0.0828 with a respective t-statistic of –1.35. The absence of significance of the overall World Index might be explained by considering each of its five components, since I am also interested in evaluating the impact of separate macroeconomic variables on firm

value. Claessens et al. (2006), La Porta et al. (2002), Karolyi (2004) among others, argue that country's macroeconomic fundamentals play an important role in financial market development, which in turn, brings foreign investment, better institutional structure, and influences firm value. The research in this paper includes five area components of the World Index as explanatory variables in the market value regressions and the remaining variables are identical to those in the previous regression. It is imperative to establish which components of the World Index contribute to the result in specification (4).

The World Index comprises five areas: size of the government sector, ability of monetary system to sustain growth; trade openness, labor, credit and business regulations, and the legal system efficiency. Regression (5) disentangles the overall country effect by these five components. As was established earlier, legal system efficiency has an insignificant effect on firm value in the sample. The same holds for the size of the government and the labor, credit and business regulations. However, access to financing measured by the efficiency of the monetary system and international trade regulations prove to have a significant impact on the value of the 166 companies from Central Europe and Russia.

The access to sound money variable has a positive effect (0.0542) on a firm's value, with a t-statistic of 2.08. This component of the Index comprises money supply growth, the rate of inflation, the standard deviation in the rate of inflation over time, and the ability of residents to hold bank accounts in foreign currencies. It seems that firms domiciled in countries with more stable monetary systems and fewer currency barriers are valued more by the market.

The international trade effect is statistically significant (-0.3041) with a t-statistic of -5.65. Freedom to trade internationally comprises taxes on international trade, regulatory trade barriers, the size of the trade sector, official exchange rate, and international capital market controls. This result is an important indicator on how investment and trade barriers impact firm valuation. Companies from Central Europe and Russia that are domiciled in countries with more international trade barriers have higher market value. It appears that the market rewards firms that are able to overcome domestic barriers to international trade with a higher valuation, as evidenced in these firms that are cross-listed. Consistent with this finding, Karolyi (2004) shows that a poor domestic environment induces firms to internationalize more intensively, and weak domestic macroeconomic policy is associated with a greater use of international markets. A different view is presented by Claessens et al. (2006), who argue that firms do not cross-list to escape poor macroeconomic and institutional factors at home, but rather those factors determine the willingness of domestic and international markets to provide financing to firms.

It is important to note that the cross-listing premium remains positive, with an average magnitude of 20%, and significant in all specifications of Table 3.12. As mentioned before, the goal of this research is to assess the valuation differences of companies from Central Europe and Russia that have issued a depositary receipt from those firms that chose not to issue a DR. So far, the difference is positive, and it remains significant after country, industry and firm controls are added. The model in Table 3.12 suffers from several problems, discussed in the methodology section, namely selection

bias and endogeneity. These concerns are addressed next with the results reported in Tables 3.13 and 3.14.

Selection bias and endogeneity arise in the cross-listing models due to the fact that firms are more likely to cross-list if they have better growth opportunities and higher Tobin's Q, as shown by Doidge et al. (2004). The errors in the valuation regressions are therefore likely to be correlated with the listing decision variable. A Heckman (1979) correction approach, which entails running a listing regression as a first step, is employed to correct for the selection bias. The results of the logit model on the listing decision are reported in Table 3.13. The table presents the effects of country variables on the decision to cross-list. Specification (1) uses the World Index of Economic Freedom as an explanatory variable, and finds that firms from countries with less economic independence are more likely to cross-list and seek international presence. The Index is negatively related to the probability of cross-listing, with a Chi-square value of -3.25, which is statistically significant at 10% level. This result is consistent with the view advanced by La Porta et al. (2002, 2006) and Doidge et al. (2004), who argue that international markets are more attractive to firms from countries with weak domestic environments. Specification (2) in Table 3.13 breaks down the overall Index by its five components and relates them to the cross-listing decision. It appears that firms in our sample, domiciled in countries with large government sectors, are more likely to cross-list. This can be attributed to the firms' desire to overcome local government bureaucracy by internationalizing. Access to sound money is significantly negatively related to the cross listing decision. Companies from countries which have difficulty in accessing money are more likely to search for financing abroad, and these

firms are generally rewarded by the markets in terms of higher valuation, as was previously shown in Table 3.12 (firms domiciled in countries with better monetary fundamentals also have higher Tobin's Q). This is consistent with Chapter 2, which highlighted the severity of financial constraints and difficulty in obtaining local financing by firms domiciled in Russia, a country that realized the highest cross-listing premium (as reported in Figure 3.4).

The next step in the Heckman correction procedure involves computing lambda, or the inverse Mill's ratio using probabilities obtained from the listing equation (see Table 3.5 for definitions of the variables). This ratio is computed for each observation in the sample and then included in the valuation equation as the explanatory variable, with the results reported in Table 3.14. The valuation equation regresses Tobin's Q on firms' sales growth as a proxy for growth opportunities, industry indicators, a listing decision variable, the World Index components, and an inverse Mill's ratio (denoted by lambda). The listing premium is positive and significant in all specifications of Table 3.14. Sales growth is positively related to Tobin's Q, implying that firms in our sample with higher growth opportunities are valued at a premium. The Heckman correction is applied to the valuation model, and the coefficient of lambda is not significant with a t-statistic of 0.18. The correction also decreases the statistical significance of the listing variable, which is consistent with the procedure specifications and findings reported in previous studies.[59] After correcting for the selection bias, the World Index coefficient is negative –0.093 and statistically significant at 10% level. One can imply that firms from countries with less economic freedom are able to enjoy higher valuations due to higher

[59] Heckman (1979) and Greene (1990) show that the coefficient for the inverse Mill's ratio is expected to be insignificant, and that the procedure should reduce the significance of the coefficient of the variable, which is being corrected for the selection bias. In this case this variable is the decision to cross-list.

future growth opportunities. Specifications (3) and (4) report results of the regression of Tobin's Q on a cross listing decision indicator, sales growth, and country macroeconomic variables. International trade development is negatively related to Tobin's Q, implying that firms in our sample from countries with higher international trade barriers are valued more because they are able to escape their home environment by internationalizing. The remaining country components of the index are not statistically significant at conventional levels. Finally, specifications (5) and (6) show that companies belonging to the information technology, oil and gas and pharmaceutical sectors have higher valuation.

4.2. Cross-listing market value premium across the types of depositary receipts

To this point, the multivariate analyses have focused on the relationship between firm value and the decision to issue a depositary receipt. The findings affirm that ADRs are associated with a positive market value premium. However, as mentioned in section 1 of Chapter 1, there are several types of ADR listings available to foreign firms. If we go back to the Table 3.4, it is clear that more than half of the cross-listings in our sample are Rule 144a private placements (29 issues), followed by 10 issues of Level 1 ADRs, and only four exchange listed depositary receipts. Therefore, I now examine the valuation effect by the type of ADR program, since information disclosure and accounting requirements vary by the type of receipts. An indicator variable is assigned for each type of issuance: Rule 144a depositary receipts; Level 1 ADRs traded over-the-counter; and exchange listed DRs. Specifications (1) and (2) in Table 3.15 show the

results on these analyses. All types of depositary receipts realize higher market value than their non-listed counterparts. Surprisingly, Level 1 ADRs have the highest premium of 0.528 out of all the issues in the sample, followed by exchange listed receipts (with a premium of 0.342) and Rule 144a (with a premium of 0.258). However, when industry controls are added in specifications (3) and (4), the significance of raising funds through an exchange listing drops below the 5% level. We have to remember that statistical precision of this estimate depends on the sample size. There are only four companies in the sample that have issued exchange traded ADRs. Their impact on Tobin's Q seems to be positive but insignificant when I control for country and industry characteristics at the same time.

The listing premium remains positive and significant after I control for the different combinations of factors. Following Doidge et al. (2004), I add an interactive indicator variable to evaluate whether firms from countries with a higher degree of economic and legal efficiency have a higher cross-listing premium, whether the premium increases with growth opportunities, and whether it increases at a higher rate for countries with more efficient legal systems. Table 3.16 reports the results of these analyses. The interaction variable for the legal system and listing decision in specifications (1) and (2) is positive and significant with a t-statistic of 2.10, implying that firms from countries with a more efficient legal system have higher valuation given that they cross-list abroad. This result confirms the conclusions of Claessens et al. (2006), who argue that stable country fundamentals increase investor confidence and spur internationalization. The monetary system interaction indicator is significantly negative, implying that companies from countries with limited access to sound money

enjoy higher valuations after cross-listing as a reward for being able to overcome local financing barriers. The cross-listing indicator in this specification is negative but insignificant. This result is consistent with that reported by Doidge et al. (2004, p.231) and is due to the fact that the interaction indicator variable has a large overall effect in the regression, even though our sample is restricted to 166 firms from four countries in Central Europe and Russia.

The impact of growth opportunities on valuation after cross-listing is explored in specifications (3) and (4) of Table 3.16. The negative and significant sign on sales growth and listing interaction indicator is surprising given a positive impact of growth on Tobin's Q, inferring that firms that are already cross-listed have a lesser impact of sales growth on valuation than non-listed matching companies. Finally, the coefficient on sales growth interacted with the listing decision and the efficiency of legal system is positive. This result implies that the valuation premium in firms from countries with higher standards of legal shareholder protection and better law enforcement is more correlated with growth opportunities, than the premium in firms from weak legal shareholder protection systems. In essence, the interaction terms are supposed to capture the marginal effect of sales growth on the cross-country premium.

V. Summary and Conclusions

Country characteristics have been shown to serve as important determinants in financial development and growth in the international finance literature. For example, country factors are closely linked to legal shareholder protection. La Porta et al. (2002, 2006), Claessens et al. (2002), Klapper and Love (2002), Durnev and Kim (2005), Doidge et al. (2004) show that firms domiciled in countries that afford a low level of

legal shareholder protection trade at a market value discount relative to companies from countries with stronger legal regimes. Durnev and Kim (2005) conclude that investment opportunities, external financing and ownership structure are positively related to company valuation. It has been reported that country variables also affect financial market development. Karolyi (2004) links stock market development to ADR growth, and finds that the ratio of market capitalization to GDP, the level of cross-border trading and equity activity are higher with a larger market for cross-listings. He argues that cross-listing is a vehicle for firms to overcome local economic, political and institutional shortcomings. On the other hand, Claessens et al. (2006), while agreeing that better institutional and macroeconomic environments spur growth of domestic stock markets, argue that firms do not cross-list to escape inefficient domestic systems, but rather they internationalize to improve country fundamentals. Claessens et al. argue that improvements in domestic fundamentals reduce the need for international markets.

As noted earlier, the studies most closely related to this one are Doidge, Karolyi and Stulz (2004), Reese and Weisbach (2002) and La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002, 2006). For example, Reese and Weisbach (2002) show that the domestic legal system has an inverse impact on the likelihood of cross-listing, and this effect is especially profound for exchange listed ADRs, and for secondary equity offerings abroad. Doidge et al. (2004) find a cross-listing premium for firms from countries with poor investor protection and for firms with high growth opportunities, as well as for exchange-listed ADRs. La Porta et al. (2002) present evidence of higher valuation in firms from countries with better protection of minority shareholders and in firms with higher cash-flow ownership by the controlling shareholder. La Porta et al.

(2006) argue that regulatory requirements influence new equity issues, concluding that private contracts matter more for stock market development than the public enforcement of laws. Therefore, firms from poor legal environments are more likely to seek financing by listing at a major U.S. exchange.

In their analyses, the above studies report that country-specific variables, particularly legal system, are important determinants of market value at a firm level. This research expands upon these findings in two ways. First, this study considers other macroeconomic characteristics as measured by the World Index and its separate components. It goes beyond legal aspects of shareholder protection, addressed by La Porta et al. (2002), Doidge et al. (2004), Reese and Weisbach (2002) among others, and includes the size of the government sector, access to sound money, development of international trade, and labor market conditions which are likely to affect decision to cross-list abroad. Second, this research uses a sample of firms from Central Europe and Russia, which were not considered in previous research. The region has received considerable investor attention due to its fast-paced growth and high rates of return. The trade-off faced by investors is the high levels of political and economic risk, which are captured in the World Index components and are applied in this research to further explain the role that micro and macro-economic variables play in corporate valuation.

The results of this study add to the prior literature on financial development concluding that firms from countries with less economic freedom are more likely to cross list.[60] Economic freedom in this study is measured by the World Index, which is negatively related to the probability of cross-listing. Further, this paper relates five

[60] La Porta et al, 2002; Doidge et al., 2004; Reese and Weisbach, 2002 find the same relationship between legal investor protection and firm value.

components of the World Index to the cross-listing decision, and reveals three important findings. First, firms from countries with large government sectors are more likely to cross-list. Second, access to sound money is significantly negatively related to the cross-listing decision. Third, companies from countries that find it difficult to access funds and have weak monetary systems are more likely to search financing abroad, and investors appear to reward them with higher valuations. The industry attributes of the companies also prove to be significant. Firms from information technology, oil, gas, and pharmaceutical industries are valued higher than companies from the other industries.

This research considers a relatively small sample of 166 companies from Central Europe and Russia, forty-three of which have issued ADRs. Ten ADRs in the sample are Level 1 and 29 issues are private placements, which have limited legal and accounting consequences, are not capital-raising issues and do not have strict disclosure requirements. The valuation premium is positive and significant, but this result cannot be entirely attributed to the legal bonding argument since over-the-counter receipts and private placements do not afford improved shareholder protection in cross-listed companies, nor do they limit private benefit consumption by controlling shareholders. The cross-listing premium documented in this study is more akin to traditional segmentation models of cross-listings and to the reputational bonding argument. Thus, companies from countries with high investment barriers are more likely to cross-list and will enjoy higher valuation benefits as a result of cross-listing. This finding is consistent with Korczak and Bohl (2005), who conduct an empirical investigation on the cross-listing decision of 33 companies from the Czech Republic, Hungary, Poland, Russia,

Slovakia and Slovenia and report that these companies experience a permanent value enhancement.[61]

Reputational bonding might also play an important role in the higher valuation of the companies from Hungary, Czech Republic, Poland and Russia. This can be further tested with data that examines the performance of cross-listed companies from before to after a financial crisis. In line with Siegel (2005), an extension of this study proposes to examine whether controlling shareholders that did not exploit outside investors during a crisis are able to enjoy continued financing from international markets due to improved reputation and revealing that they are "good quality" companies.

A further extension of this study might also consider each subcomponent of the World Index in a greater depth. This study found that the size of the government sector and the freedom to trade internationally, have a significant impact on a company's decision to cross-list. One might also go into greater depth and decompose the various inputs that go into each of these variables, analyzing the different subcomponents in the regression specifications presented herein.

As is always the care, emerging markets provide us with a challenge of relying on limited information and adjusting existing empirical and theoretical models to accommodate for less than efficient markets. The conclusions in this research have to therefore be taken with caution, since the analyses are based on relatively limited data, which were publicly available. With time, and access to better information, a replication

[61] Cumulative abnormal returns are positive and significant at 25% around the DR offering. Following a DR, stock liquidity improves, and the average turnover ratio in the domestic market increases significantly by 34%.

of the analyses performed in this study are likely to confirm the importance of micro- and macro-economic variables in assessing the valuation impact of the decision to cross-list in Central Europe and Russia.

CHAPTER 4. SUMMARY AND CONCLUSIONS

Two major mechanisms in alleviating the market value discount in firms from emerging economies include cross-listing in a country with stronger institutions and improving corporate governance standards. This research focuses on the first way to improve firm value, namely a Depositary Receipt (DR) issuance. Prior literature on the effects of cross-listing on firm value consider legal shareholder protection variables as the key determinant of the value premium to cross-listing.[62] The studies also choose to exclude a large segment of rapidly growing firms from emerging countries of Central Europe and Russia. This research seeks to rectify these shortcomings. In sum, it aims explain valuation differences between companies from Central Europe and Russia that issue depositary receipts and comparable firms in the region that do not cross-list, controlling for country and firm-specific characteristics that might influence the decision to cross-list.

Chapter 1 of this research presents a background on two major hypotheses on the cross-listing decision advanced in the international finance literature, namely market segmentation and the bonding hypothesis. Several insights stem from these literature. First, strong information flows and linkages between the home and the foreign markets are beneficial to cross-listed firms in terms of reduced cost of capital and positive market revaluation. Second, the degree of integration between local and foreign markets plays an important role for cross-listing effects to materialize. If most cross-listings are indeed conducted to avoid previous market segmentation and provide companies with improved access to capital markets, then companies from countries with severe

[62] La Porta et al., 2002; Doidge et al., 2004, among others.

investment barriers will experience greater cross-listing benefits. Several findings challenge the segmentation hypothesis. Miller (1999) and Foerster and Karolyi (1999) report that a positive response to a cross-listing is more pronounced for exchange listed receipts, and Foerster and Karolyi (1999) document a smaller post-listing share-price decline for capital-raising depositary receipt issues. Both findings suggest that there are informational consequences of DR issues. Further, Karolyi (2004) acknowledges that in the 1990s the degree of segmentation was alleviated while the number of cross-listings increased.

These aforementioned challenges to the market integration hypothesis have led to the development of the legal bonding hypothesis, advanced by Coffee (1999) and Stulz (1999). It asserts that internationalization allows companies to alleviate informational asymmetry problems by "bonding" themselves to markets with greater disclosure requirements and stronger shareholder protection systems. Doidge, Karolyi and Stulz (2004) and Doidge (2004) find support for legal bonding and document a large valuation premium of 16% for 712 cross-listed firms relative to 4,078 firms without a DR. They confirm that the premium is higher for companies from countries with poorer legal investor protection, and it is greater for exchange-listings than OTC listings and SEC Rule 144a private placements.

Eun and Sabherwal (2003) argue that bonding and market integration might not be mutually exclusive motives for cross-listings. Imperfect and segmented domestic capital markets can force firms to seek financing abroad. Over time, as market barriers disappear and national securities regimes converge, firms might cross-list to create positive market reputation. The possibility of simultaneous motives for cross-listings is

tested by Lee (2003) through the analysis of spill-over effects on domestic companies. He measures the share price reaction to an ADR announcement of rival non-ADR firms, and argues that the positive return on competitor firms can be seen as evidence of market integration and decreased perceived risk that is now being shared globally. However, Lee (2003) does document a negative return and interprets that finding as evidence of inability of non-ADR firms to bond themselves to the U.S. legal regime. As more data becomes available, it will be interesting to perform a spill-over study of DR listings on domestic firms in Central Europe and Russia, since the issue does remain unresolved.[63]

Much of the prior work on cross-listings excludes transitional economies from their analyses. This research seeks to fill this gap and contributes to the existing literature on cross-listings by focusing on the share price and market value reaction to a DR issue of firms from a few of the omitted countries, namely the Czech Republic, Hungary, Poland and Russia. To begin, I present a brief background on specific financing constraints placed on Russian companies operating in domestic market in Chapter 2. Then, a possible resolution to the problem, namely DR issuance, is considered. Using an event study methodology with a modified covariance structure of returns, Chapter 2 tests the market segmentation hypothesis on the benefits of cross-listing on the share value of companies from Russia. It examines the underlying share price response to a DR issue for 16 Russian companies, comparing returns and variances before and after the listing date. The results have to be interpreted with caution due to a limited sample size. The empirical evidence indicates that there is a

[63] Fernandes (2003) find positive impact of ADR issues on local firms; Melvin and Valero-Tonone (2003) employ a different measurement procedure to find a negative adverse spill-over effect.

significant negative average abnormal return of -1.045% on the 16 underlying stocks on the ADR listing day. This result, though surprising, is similar to that of Lau, Diltz and Apilado (1994), who report a temporary negative valuation impact on the first trading date for a sample consisting of 346 U.S. firm stock listings on ten different stock exchanges. The cumulative average abnormal returns over the interval of day -5 to day +3 around the first trading day was negative, which was followed by a negative post-listing period return for firms listing on the Tokyo and Basel Stock Exchanges. Lau et al. (1994) attributes this result to the fact that a DR listing by a U.S. company is often placed in a market with a greater cost of capital than the U.S. market, yielding a negative reaction by U.S. investors. In the case of the 16 Russian DRs, the negative return on the DR listing day might be explained by the nature of the Russian DRs, which are mostly Level 1 listings with limited information disclosure requirements. These types of issues generally result in a lower share price response than Level 2 and Level 3 issues (Miller, 1999; Foerster and Karolyi, 1998; Doidge, Karolyi and Stulz, 2004).

In addition, the Russian companies that list ADRs as over-the-counter pink sheets, experience a negative market reaction. The least costly pink sheets Level 1 ADRs provide the most favorable local market response. This is a puzzling result, since the liquidity and investor recognition hypotheses would predict that firms that list on PORTAL as Level 1 ADRs should elicit the lowest investor awareness and the smallest price response (Miller, 1999). Nonetheless, this finding might be attributed to the fact that local investors are seeking the cheapest way to access overseas markets, trying to keep issuing costs down.

An examination of return variances for these firms reveals that eleven out of 16 companies in the sample experienced a greater volatility of returns after the ADR listing (in comparison to before the listing) using domestic stock returns. The remaining five companies reported a decrease in the post-listing return variance, which represents a minor quandary. The increase in variance for the eleven companies is consistent with Freedman's (1989) information hypothesis, which postulates that an increased amount of information being revealed to informed investors both in the domestic and in the international markets after an ADR listing date leads to more trades being executed and a higher return variance. The remaining five companies present a fly-in-the-ointment, though Lau, Diltz and Apilado (1994) document similar results to those documented here for a sample of 346 cross-listings on ten stock exchanges. Their tests for the equality of stock return variances between event periods and market model estimation periods also fail to reveal a definitive impact.

The mixed results can be attributed to information asymmetries of non-capital-raising DRs that are described in Chapter 1. Over-the-counter listings do not require adherence to GAAP standards of financial reporting, thus reducing the quality of new company information received by the market. Another possible explanation of the results lies in the recent literature on adverse spillover effects of cross-listings. For example, Karolyi (2004) finds that the quality of the local market is eroded after an increase in ADR activity. This finding is based on evidence from 12 countries from Asia and Latin America. Levin and Schmukler (2006) examines the effects of cross-listing in 45 emerging countries and finds a diversion of trading from local to international firms, and a decrease in liquidity and turnover for domestic companies.

Claessens, Klingebiel and Schmukler (2002) show that these effects are more pronounced for firms in countries with the least efficient legal systems and with less per capita income. Edison and Warnock (2003) find that cross-listings in the local market result in some foreign equity flows, but these flows are transitory.

Critics of globalization often express concern about the increased volatility of stock markets, leading to unstable investment and consumption in local economies.[64] The argument in fact holds in this paper. Although the return volatilities do not change consistently for the whole sample, eleven companies experienced an increase in variability of local stock returns, while 5 did not.

Thus, the positive effects of financial globalization are still limited. Stulz (2005) develops a model where predatory and contracting powers of state and corporate insiders collide to create agency barriers, which limit the effects of globalization. Country characteristics remain very much relevant even when international barriers to investment disappear. This idea is true in the case of the emerging economies of Russia and Central Europe. Although, neoclassical models argue that financial globalization is beneficial for aggregate economic welfare, this positive effect cannot take place in the absence of necessary institutional and legal frameworks. Chapter 3 expands this line of reasoning, and the analyses incorporate country factors in five major areas, including property rights protection, contract enforcement, monetary stability, banking system, and government intervention in the economy.

Chapter 3 also remedies some of the measurement and data issues that plague Chapter 2. First, the sample size is increased by adding companies from Central Europe. Second, the analyses go beyond historical daily price data to explore annual Tobin's Q

[64] Prasad, Rogoff, Wei and Kose (2003).

as a proxy measure of value. This provides an opportunity to corroborate the event study findings on stock prices in this chapter, and incorporate firm-specific and country-specific characteristics in the analyses.

The results on the valuation analyses reveal an average cross-listing premium of 20% for a sample of 43 companies with DRs relative to 123 firms that chose not to issue a depositary receipt from Central Europe and Russia. This study also finds that companies from countries with the least economic freedom, like Russia, are more likely to cross-list abroad to avoid a poor domestic environment. The degree of economic freedom is measured by the World Index, compiled by the Fraser Institute.[65] While these findings are consistent with the prior literature on cross-listings (Doidge et al, 2004; Reese and Weisbach, 2002), my research further reveals additional country-specific variables that affect the decision to cross-list in addition to the legal investor protection. The effectiveness of the legal system in protecting minority shareholders is extensively discussed in prior research (La Porta et al., 2002, Doidge et al., 2004, Reese and Weisbach, 2002). In this research in addition to legal shareholder protection, the size of the government sector, which proxies the government involvement in the economy is statistically significant in determining the corporate valuation premium. This research also uncovers that firms from countries with a large government sector are more likely to cross-list, and when they do, they realize higher valuation premiums than their local counterparts. In addition, companies from countries that have difficulty in accessing money are also more likely to seek a cross-listing. These results hint the

[65] Fraser Institute in Canada provides annual country ratings in five areas of economic freedom, which are discussed in Chapter 3 of this research. The data are available at www.fraserinstitute.ca.

importance of financial development and growth variables in the decision to cross-list and firm valuation.

One interesting additional result is that a cross-listing premium exists for firms that pursue SEC Rule 144a and Over-the-Counter placements. This finding is consistent with Pinegar and Ravichandran (2004) and O'Connor (2004), who challenge the legal bonding hypothesis. According to the latter hypothesis controlling shareholders make a credible commitment to minority investors that they are willing to curb their diversion of benefits by undertaking the decision to cross-list. However, stricter corporate governance regulations that come with Level 2 and Level 3 cross-listings are not present in Rule 144a and Over-the-Counter placements. These firms should, in theory, not experience any major impact on Tobin's Q from the cross-listing event, and yet they do. This would imply that mechanisms other than legal bonding are responsible for the higher valuation premiums in these firms. Pinegar et al. (2004) propose that the voluntary disclosure of certain financial and non-financial information might be responsible for their finding. Siegel (2005) suggests that a firm's reputation improves with cross-listing, even if it is an OTC or a Rule 144a placement. He advances that the reputational bonding argument can explain the valuation premium of such listings.

The key research question of the current thesis is the impact of cross-listing on firm value in countries of Central Europe and Russia. The companies from that region are characterized by an abundance of affordable natural resources, educated labor force, and high shareholder returns. On the downside, the political and economic risk of the region remains substantial, with volatility in inflation in Russia and current account deficits in Hungary, Poland, and the Czech Republic. These macroeconomic factors

create a market value discount for firms from the region. The two questions this research seeks to address are if a cross-listing provides a way to eliminate the market value discount in firms from Central Europe and Russia, and whether macroeconomic factors contribute to a firm's decision to cross-list. The findings suggest that firm value can be improved by a DR issuance, and that size of the government sector and access to local financing are the main factors of the firms' cross-listing decision. The results are to be interpreted with caution due to a limited sample size. As more data becomes available, these findings are likely to be corroborated.

TABLES

Table 1.1. Real GDP Annual Growth Rates

Real GDP growth rates are reported in percent. E denotes estimated number.

	2000	2001	2002	2003	2004	2005	2006E	2007E
Emerging Europe	5.0	0.3	4.4	4.7	6.5	5.4	5.2	4.8
Czech	3.9	2.6	1.5	3.2	4.7	6.0	5.5	4.5
Hungary	5.2	4.3	3.8	3.4	4.6	4.1	4.4	4.2
Poland	4.2	1.1	1.4	3.8	5.3	3.2	4.2	3.8
Commonwealth of Independent States (CIS)	9.0	6.3	5.3	7.9	8.4	6.5	6.0	6.1
Russia	10.0	5.1	4.7	7.3	7.2	6.4	6.0	5.8

Source: World Economic Outlook, IMF statistics, 2006.

Table 1.2. Consumer Prices and Current Account Balance

Consumer prices and Current account balance as a fraction of GDP are reported in annual percentage change terms.
E denotes estimated number.

	Consumer prices				Current account balance (% of GDP)			
	2004	2005	2006E	2007E	2004	2005	2006E	2007E
Emerging Europe	6.2	4.9	4.2	3.4	-5.7	-5.2	-5.4	-5.3
Czech Republic	2.8	1.8	2.8	3.0	-6.0	-2.1	-2.3	-2.3
Hungary	6.7	3.5	2.0	2.7	-8.8	-7.9	-8.2	-7.5
Poland	3.5	2.1	1.3	2.3	-4.1	-1.6	-2.5	-3.1
CIS	10.3	12.3	10.4	9.7	8.1	9.1	9.6	8.1
Russia	10.9	12.6	10.4	9.5	9.9	11.3	11.8	9.5

Source: World Economic Outlook, IMF statistics, 2006.

Table 1.3. Total Shareholder Return (TSR) Index

TSR Index returns and their changes are reported from 1999 to 2006.

	TSR as of March 8, 2006	Change since December 31, 1999
Emerging markets	200.1	100.1%
S&P 500	93.0	-7.0%

Source: The Boston Consulting Group analysis, Business Week, July 2006.

Table 1.4. DR Sample by Level, Exchange and Country of Origin

The table lists Depositary Receipts, issued by companies from the Czech Republic, Hungary, Poland and Russia.

Name	Exchange, Level	Depository	Country	Industry	Effective date
CESKE RADIOKOMUNIKACE	144A/Reg S	BNY	Czech	Telecommunications	3/1998
CESKY TELECOM	144A/Reg S	BNY	Czech	Telecommunications	6/1998
CEZ A.S.	144A/Reg S	DB	Czech	Energy	3/1995
KOMERCNI BANKA A.S.	144A/Reg S	BNY	Czech	Banks	6/1995
BORSODCHEM RT	144A/Reg S	BNY	Hungary	Chemicals	3/1996
DELMAGYARORSZAGI ARAMSZOLGALTATO RT. – DEMASZ	144A/Reg S	JPM	Hungary	Electric	4/1998
FOTEX RT ELSO AMERIKAI	OTC, Level 1	JPM	Hungary	Retail	7/1992
GEDEON RICHTER	144A/Reg S	BNY	Hungary	Pharmaceuticals	11/1995
MAGYAR TÁVKÖZLÉSI RT. – MATÁV	NYSE	JPM	Hungary	Telecommunications	11/1997
MOL MAGYAR OLAJ-ES GAZIPARE RESZVENYTAR	144A/Reg S	JPM	Hungary	Oil and gas	1/2001
OTP BANK	144A/Reg S	BNY	Hungary	Banks	10/1997
PANNONPLAST RT.	OTC, Level 1	BNY	Hungary	Manufacturing	10/1997
SYNERGON INFORMATION SYSTEMS LTD.	144A/Reg S	DB	Hungary	Computers	4/1999
TISZAI VEGYI KOMBINAT RT. (TVK)	144A/Reg S	BNY	Hungary	Chemicals	7/1996
ZALAKERAMIA RT.	144A/Reg S	BNY	Hungary	Building materials	5/1997
AGORA SA	144A/Reg S	DB	Poland	Media	3/1999
BANK HANDLOWY W WARSZAWIE S.A.	144A/Reg S	BNY	Poland	Banks	6/1997
BANK MILLENIUM	PORTAL, 144A	BNY	Poland	Banks	7/28/1997
EUROPEJSKI FUNDUSZ LEASINGOWY	144A/Reg S	DB	Poland	Diversified financial services	2/2000
KGHM POLSKA MIEDZ SA	144A/Reg S	DB	Poland	Mining	7/1997
KREDYT BANK PBI S.A.	144A/Reg S	DB	Poland	Banks	12/1997
MOSTOSTAL EXPORT CORP.	OTC, Level 1	BNY	Poland	Engineering and construction	2/1997

Table 1.4 continued

MOSTOSTAL WARSZAWA S.A.	144A/Reg S	DB	Poland	Engineering and construction	5/1998
NETIA HOLDINGS S.A.	NASDAQ, Level 3	BNY	Poland	Telecommunications	8/1999
NIF PIERWSZY	144A/Reg S	BNY	Poland	Banks	6/1997
ZACHODNI Bank WBK	144A/Reg S	BNY	Poland	Banks	6/1997
ORBIS	144A/Reg S	DB	Poland	Hotel chain	11/1997
ORFE S.A.	144A/Reg S	BNY	Poland	Wholesale	12/1998
PROKOM SOFTWARE S.A.	144A/Reg S	BNY	Poland	Internet	12/1997
SOFTBANK S.A.	144A/Reg S	BNY	Poland	Software	4/1998
STALEXPORT	144A/Reg S	BNY	Poland	Metal hardware manufacturing	7/1998
TELEKOMUNIKACJA POLSKA SA	144A/Reg S	BNY	Poland	Telecommunications	11/1998
AEROFLOT RUSSIAN AIRLINES	144A/Reg S	DB	Russia	Airlines	12/2000
AOA AVTOVAZ	144A/Reg S	BNY	Russia	Automotive	10/1999
CHERNOGORNEFT	OTC, Level 1	BNY	Russia	Oil and gas	3/1996
JSC ROSNEFTEGAZSTROY	OTC, Level 1	BNY	Russia	Oil and gas	8/1997
JSC SAMARAENERGO	OTC, Level 1	BNY	Russia	Electric	2/1998
LUKOIL	OTC, Level 1	BNY	Russia	Oil and gas	12/1995
MOSCOW CITY TELEPHONE NETWORK	OTC, Level 1	BNY	Russia	Telecommunications	6/1999
NORILSK NICKEL	OTC, Level 1	BNY	Russia	Mining	6/2001
OAO ROSTELECOM	NYSE, Level 2	BNY	Russia	Telecommunications	2/1998
TATNEFT AO	NYSE, Level 2	BNY	Russia	Oil and gas	3/1998
YUKOS	OTC, Level 1	DB	Russia	Oil and gas	3/2001

Source: The Bank of New York, ADR division.

Table 2.1. Per Capita Income Distribution in the Russian Regions.

The table provides monthly per capita income in the local Russian currency and in the U.S. dollars using 2005 exchange rate.

	Monthly per capita income, 2005 rubles	Monthly per capita income, 2005 dollars
Central	10,816.3	360.54
Urals	9,692.4	323.08
North-West	8,775.7	292.52
Volga	6,421.8	214.06
South	5,804.9	193.50

Source: IMF statistics, 2006

Table 2.2.Basic Characteristics of Cross Listed Stocks

The table provides ADR description by type and effective listing date, and firm description by industry and market capitalization.

Company name	Type of issue	Industry	Market Cap, US$	Effective date
Aeroflot	144a	Airlines	388,175,845	Dec-22-2000
AO Mosenergo	Level 1	Utility - Gas and Electric	1,201,378,963	July-17-1997
AO Surgutneftegas	Level 1	Oil and Gas –Service	11,546,646,965	Dec-30-1996
Bank Vozrozhdeniye	Level 1	Banking	41,000,705	July-03-1996
Chernogorneft	Level 1	Oil and Gas-Service	66,927,505	Mar-01-1996
Irkutskenergo	Level 1	Utility - Gas and Electric	383,251,379	Jan-23-1997
Samaraenergo	Level 1	Utility - Gas and Electric	119,233,240	Feb-09-1998
Lukoil	Level 1	Oil and Gas-Service	12,183,889,751	Dec-01-1995
Moscow City Telephone Network	Level 1	Telecom – Data Networking	578,760,241	June-21-99
Norilsk Nickel	Level 1	Mining and Minerals	3,162,888,660	June-15-01
Rostelecom	Level 2	Telecom-Data Networking	847,716,344	Feb-12-1998
Seversky Tube Works	Level 1	Steel	33,690,300	Feb –01-01
Sibneft	Level 1	Oil and Gas - Service	4,443,071,293	Apr-20-1999
Tatneft	Level 2	Oil and Gas - Service	1,105,685,429	Mar-25-1998
TSUM	Level 1	Household Prod-Appliances	30,483,380	July-03-1997
GUM	Level 1	Retailing	93,000,006	June-07-96

Table 2.3. Average Abnormal Returns and Cumulative Abnormal Returns

AAR and CAR are reported for each day in the event window.
** indicates significance at 5%; * indicates significance at 10%.

Days	$AAR_{t,T}$	$CAR_{t,T}$
-25	-0.00844**	-0.00844
-20	-0.00101	-0.04869
-15	0.00291	-0.06068
-10	-0.00766	-0.10726
-5	-0.00113	-0.13826
-2	0.05182	-0.12195
-1	-0.01127**	-0.13322
0	-0.01045**	-0.14368
1	-0.01934**	-0.16302
2	-0.01236**	-0.17539
5	-0.03275**	-0.19012
10	-0.00722	-0.12569
15	-0.00276	-0.15288
20	-0.00194	-0.19347
25	-0.00353	-0.19878

Table 2.4. Average Abnormal Returns Around the Listing of DR by Offering Type and Time Windows

Average Abnormal Returns are reported by the listing type. ** indicates significance at 5%.

ADR type	t=-25 to -2	t=-1 to +1	t=+2 to+25
Rule 144 / PORTAL	-0.00799	-0.05371	-0.14718
OTC pink sheets (Level 1)	0.04758	-0.00937	0.04996
NYSE (Level 2)	0.00578**	-0.05726	-0.05053
Total sample	0.04546	-0.12028	-0.14775

Table 2.5. Variance Ratios

Ratios are comparing variance after the listing to variance before the listing. Before period includes [-175, -26] days before the listing. After period includes [+26, +175] days after the listing. 11 ratios are greater than one, 5 ratios are less than one.
** indicates significance at 5%; * indicates significance at 10%.

Company	Type of issue	Variance ratio
Aeroflot	144a	1.142
AO Mosenergo	Level 1	1.823**
AO Surgutneftegas	Level 1	0.063**
Bank Vozrozhdeniye	Level 1	5.776**
Chernogorneft	Level 1	16.307**
Irkutskenergo	Level 1	0.226**
Samaraenergo	Level 1	8.686**
LUKoil	Level 1	0.075**
Moscow City Telephone Network	Level 1	0.839
Norilsk Nickel	Level 1	4.107**
Rostelecom	Level 2	2.009**
Seversky Tube Works	Level 1	2.097**
Sibneft	Level 1	0.085**
Tatneft	Level 2	4.939**
TSUM	Level 1	1.964**
GUM	Level 1	5.598**

Table 3.1. Comparative Statistics

Average Tobin's Q (median Tobin's Q) is the average (median) ratio of market to book value of total assets from 2000 to 2003. Average sales growth is the growth rate of sales revenue over the period of 2000 to 2003.

	Czech	Hungary	Poland	Russia
Average Q	0.8751	0.9336	1.2067	1.1538
Median Q	0.7573	0.8502	1.044	0.8975
Average sales growth	1.55%	6.53%	9.09%	35.89%

Table 3.2. Summary of the Sample

The table shows the country of origin, number of issuers and control sample.

Country	Number of ADR issuers	Type of ADR	Number of non-issuers	Number of firms
Czech Republic	4	Reg S, Rule 144a, Level 1	25	29
Hungary	11	Reg S, Rule 144a, Levels 1, 3	23	34
Poland	17	Reg S, Rule 144a, Levels 1, 3	55	72
Russia	11	Reg S, Rule 144a Levels 1, 2	20	31
Number of firms	43		123	166

Table 3.3. Allocation of ADR Issues by Industry and Country

The table reports a breakdown of firms in the sample by industry, by country, and by issuers and non-issuers.

Industry	Total	Issued DR	Non-DR	Czech	Hungary	Poland	Russia
Manufacturing	52	10	42	11	13	26	4
Energy	28	4	24	10	3	2	13
Financials	23	8	15	2	5	15	1
Information/Telecom	18	9	9	2	3	9	4
Oil and gas	11	4	7	3	---	---	8
Trade	9	2	7	---	4	5	---
Pharmaceuticals	8	2	6	---	2	6	---
Construction	6	1	5	---	1	5	---
Mining	5	1	4	2	---	2	1
Services	4	---	4	---	2	1	1
Real estate	2	---	2	---	1	1	---
Number of firms	166	43	123	29	34	72	31

Table 3.4. Allocation of DR Issues by Type and Trading Platform

The table reports a breakdown of cross-listed companies in the sample by the type of depositary receipt.

Country	PORTAL (144a)	NYSE, NASDAQ (Level 2, 3)	OTC (Level 1)	Total DR issues
Czech	4	---	---	4
Hungary	8	1	2	11
Poland	15	1	1	17
Russia	2	2	7	11
Number of firms	29	4	10	43

Table 3.5. Definitions of the Variables

The table summarizes firm, industry and country variables used in regression analyses.

Variable	Definition
Tobin's Q	Market value of total assets divided by the book value of total assets. Market value of total assets is computed as the sum of market value of equity (number of shares outstanding, Datastream item *NS*, multiplied by the share price, *P*) and the book value of liabilities (the book value of total assets, Datastream item *# 392*, minus the book value of equity, Datastream item *# 307*).
Listing variable	Takes on a value of one if a firm has issued a Depositary Receipt (DR), and zero otherwise.
Lambda	Inverse Mill's ratio is computed as $\lambda_{ji} = \left(\frac{-3}{\pi^2}\right)\left[\sum_{k \neq j}\left(\frac{P_{ki}}{1-P_{ki}}\right)\log(P_{ki}) + \log\left(P_{ji}\right)\right]$ where P_{ji} is a probability that a firm *i* chooses an alternative *j* – either issues a depositary receipt or chooses not to issue a DR.
Sales growth	The annual percentage growth rate in firm sales revenue, Datastream item *# 104*, over the period of 2000 to 2003.
World Index	Can be obtained from the Fraser Institute (http://www.fraserinstitute.ca). It is compiled from the International Country Risk guide and the Global Competitiveness Report. The World Index measures the degree of economic freedom in five areas: size of government; legal structure and protection of property rights; access to sound money; international trade and exchange; and regulation of credit, labor and business. The World Index ranges from 0 through 10, with higher values indicating higher levels of economic freedom.
Size of government	The first component of the World Index includes government consumption, transfers and subsidies, share of goods produced by government enterprises and income tax rates. Higher ratings mean less government involvement in a country's economy.
Legal System	The second component of the World Index focuses on rule of law, security of property rights, independent judiciary, and the impartial court system. Higher ratings mean effective legal system.
Monetary System	The third component of the World Index is devoted to monetary stability, inflation and the regulation of banks in offering saving and checking accounts in foreign currencies. Higher ratings mean better access to sound money in domestic market.

Table 3.5 continued

International Trade	The fourth component of the World Index comprises a wide variety of restraints that affect international exchange: tariffs, quotas, hidden administrative restraints, controls on the exchange rate and capital. Higher ratings in this area mean international trade openness.
Labor Market	The fifth component of the World Index measures burden of different credit, labor and business regulations on firms. Higher ratings in this area mean less bureaucratic regulations of domestic markets.

Table 3.6. Country Ratings and Data Behind the Ratings in Area 1: Size of Government.

Country ratings and the data used to compile the ratings are obtained from the Fraser Institute, Annual Report 2005. Each area sub-component is assigned a rating based on the actual statistics with the weighted average methodology described in detail at www.fraserinstitute.ca.

Countries	General government consumption (percent of total consumption) 1A	Transfers and subsidies as a share of GDP 1B	Government enterprises and investment as a share of gross investment 1C	Top Marginal Income Tax Rate 1-Di	Top Marginal Income and Payroll Tax Rate 1-Dii	Top marginal tax rate 1D	Size of Government AREA 1
Czech	2.3	3.7	8.0	7.0	1.0	4.0	4.5
Statistics (%)	32.1	23.6	18	32	58	---	----
Hungary	7.7	4.9	8.0	5.0	0.0	2.5	5.8
Statistics (%)	13.7	19.2	19	38	64	---	---
Poland	5.5	5.0	8.0	5.0	2.0	3.5	5.5
Statistics (%)	21.2	18.7	19	40	52	---	---
Russia	4.2	5.9	4.0	10.0	5.0	7.5	5.4
Statistics (%)	25.7	15.4	35	13	39	---	---

Table 3.7. Country Ratings in Area 2: Legal System and Property Rights

Country ratings in area 2 are based on survey questions and are largely qualitative.

Countries	Judiciary independence 2.A.	Impartial courts 2.B.	Protection of intellectual property 2.C.	Military in Politics 2.D.	Law and Order 2.E.	Legal System & Property Rights AREA 2
Czech	5.8	3.7	4.8	10.0	8.3	6.5
Hungary	6.0	4.8	5.3	10.0	6.7	6.6
Poland	3.5	3.0	3.0	10.0	6.7	5.2
Russia	2.5	3.0	2.8	8.3	6.7	4.7

Table 3.8. Country Ratings in Area 3: Access to Sound Money

Average growth in money is over the last 5 years and growth of real GDP is over the last 10 years. The standard deviation of annual inflation is taken over the last 5 years. Annual inflation is for the most recent year. Freedom of citizens to open bank accounts in a foreign currency is considered both domestically and abroad.

Countries	Average growth of money minus growth of real GDP 3.A.	Standard deviation of annual inflation 3.B.	Annual inflation 3.C.	Freedom of citizens to own foreign currency bank accounts 3.D.	Access to Sound Money AREA 3
Czech	7.1	8.8	10.0	10.0	9.0
Statistics (%)	14.6	3	0.1	---	---
Hungary	9.3	9.5	9.1	10.0	9.5
Statistics (%)	3.5	1.1	4.6	---	---
Poland	8.9	8.5	9.9	5.0	8.1
Statistics (%)	5.5	3.9	0.7	---	---
Russia	3.1	0.0	7.3	5.0	3.8
Statistics (%)	34.5	30.5	13.7	---	---

Table 3.9. Country Ratings in Area 4: Freedom to Trade Internationally

The table reports intensity of barriers to international trade. International trade tax revenues are taken as percentage of exports plus imports. Regulatory trade barriers include non-tariff trade barriers and compliance cost of importing and exporting. Restrictions on the freedom to trade internationally include restrictions on citizens to engage in capital market exchange with foreigners.

Countries	International trade tax revenues 4Ai	Mean tariff rate 4Aii	Standard deviation of tariff rates 4Aiii	Tariffs 4A	Regulatory trade barriers 4B	Foreign ownership restrictions 4Ei	Restrictions in foreign capital market exchange 4Eii	International capital market controls 4E	Freedom to trade internationally AREA 4
Czech	9.8	9.0	6.3	8.3	7.3	8.6	6.2	7.4	8.2
Statistics (%)	0.3	5.1	9.3	---	---	---	---	---	---
Hungary	9.6	8.2	4.1	7.3	7.6	9.6	8.5	9.0	8.4
Statistics (%)	0.6	8.9	14.7	---	---	---	---	---	---
Poland	9.5	9.3	6.1	8.3	6.3	7.2	2.3	4.8	6.5
Statistics (%)	0.8	3.4	9.8	---	---	---	---	---	---
Russia	6.1	7.9	7.8	7.3	5.6	6.0	3.1	4.5	6.9
Statistics (%)	5.8	10.4	5.4	---	---	---	---	---	---

Table 3.10. Selected Country Ratings in Area 5: Regulation of Banking, Labor and Business

Country ratings in area 5 are based on survey questions and are largely qualitative.

Countries	Ownership of bank 5Ai.s	Interest rate controls 5Av	Credit Market Regulation 5A	Labor market Regulations 5B	Price controls 5Ci	Burden of regulations 5Cii	Time with government bureaucracy 5Ciii	Business regulations 5C	Regulation AREA 5
Czech	8.0	6.3	8.0	4.9	7.0	2.8	6.3	5.2	6.0
Hungary	8.0	8.0	8.1	5.5	6.0	2.8	8.3	6.1	6.6
Poland	8.0	6.2	8.1	4.3	1.0	2.0	5.5	3.5	5.3
Russia	5.0	4.2	6.2	4.6	3.0	2.5	4.8	3.7	4.8

Table 3.11. Country Ratings Summary

The table reports the overall World Index and its components from 2000 to 2003.

Year	Size of Government	Legal Structure and Security of Property Rights	Access to Sound Money	Freedom to Trade Internationally	Labor, Credit and Business Regulations	World Index
			Czech Republic			
2000	4.3438	6.8878	8.1144	8.4548	5.7115	6.8449
2001	4.2231	6.5511	9.1206	8.4276	5.7358	6.8116
2002	4.1543	6.3667	8.8622	8.3726	5.9828	6.7477
2003	4.5123	6.5333	8.9669	8.1791	6.0341	6.8451
			Hungary			
2000	4.7628	7.0120	7.1126	7.7686	6.9940	6.5622
2001	5.2446	6.7425	8.6327	8.5042	6.5551	7.1358
2002	5.7921	6.7333	9.0789	8.3696	6.4028	7.2754
2003	5.7819	6.5667	9.4781	8.4360	6.5946	7.3715
			Poland			
2000	5.0311	6.4980	7.4837	6.8842	5.8567	5.7740
2001	5.4943	5.7760	7.8455	6.6602	5.3662	6.2285
2002	5.5072	5.9000	7.9908	7.0371	5.4601	6.3790
2003	5.5193	5.2333	8.0520	6.5423	5.2831	6.1260
			Russia			
2000	5.2686	4.4469	3.6499	6.9442	4.4294	4.4922
2001	5.4943	5.7760	7.8455	6.6602	5.3662	4.8634
2002	5.5611	4.4333	4.0637	7.0102	4.4813	5.1099
2003	5.4068	4.6667	3.8399	6.9213	4.8436	5.1357

Table 3.12. Market Value Premium of Cross-Listed Firms

The dependent variable is Tobin's Q. T-statistics are reported in parentheses. Industry indicator variables are added as controls in specifications 3-5, and are left out for brevity. * indicates statistical significance at 10%; ** indicates statistical significance at 5%.

	(1)	(2)	(3)	(4)	(5)
Constant	1.483** (7.87)	1.333** (6.80)	0.977** (3.21)	1.171** (3.48)	2.386** (3.76)
Cross-list	0.332** (5.18)	0.314** (4.90)	0.196** (3.19)	0.198** (3.22)	0.232** (3.81)
Legal System	-0.083** (-2.64)	-0.061* (-1.89)	-0.023 (-0.73)	0.034 (0.64)	-0.046 (-0.45)
Sales growth		0.223** (2.68)	0.155** (2.02)	0.133* (1.71)	0.179** (2.35)
World Index				-0.083 (-1.35)	
Size of government					-0.077 (-1.04)
Monetary system					0.054** (2.08)
International Trade					-0.304** (-5.65)
Labor, credit and business regulations					0.163 (1.50)
Industry indicators			Yes	Yes	Yes
Number of observations	644	644	644	644	644
Overall R^2	0.052	0.062	0.237	0.239	0.276

Table 3.13. The Effects of Country Variables on the Decision to Cross List

The table presents the results of logistic regressions on the listing decision as a dichotomous variable on the different combinations of country characteristics. Listing variable takes a value of 1 for cross-listed companies and value of zero otherwise. Chi-square values are reported in parentheses.

	Logistic procedure (1)	Logistic procedure (2)
Constant	0.208 (0.09)	-5.288 (6.76)
World Index	-0.204* (-3.25)	
Size of government		0.597* (4.83)
Legal System		-0.117 (0.094)
Monetary System		-0.210* (-5.387)
International Trade		0.080 (0.203)
Labor Market		0.488 (1.521)
Number of observations	644	644
Pseudo McFadden R^2	0.0043	0.0246

Table 3.14. Effects of Cross-Listing on Company Valuation

The table presents results of regressions of Tobin's Q as a dependent variable on sales growth, a listing decision variable, the World Index of economic freedom, macroeconomic variables, and industry indicators.
** indicates statistical significance at 5%; * indicates statistical significance at 10%.

	OLS	Heckman	OLS	Heckman	OLS	Heckman
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.556**	1.518**	2.865**	1.923	1.173**	1.072**
Listing variable	0.315**	0.317**	0.324**	0.324**	0.196*	0.203*
Lambda		0.258		1.826		0.851
World Index	-0.093*	-0.096*			-0.051	-0.064
Sales growth	0.195**	0.196**	0.251*	0.252*	0.136*	0.141*
Size of Government			-0.091	-0.010		
Legal System			-0.078	-0.086		
Monetary System			0.027	0.002		
International Trade			-0.256**	-0.255**		
Labor Market			0.129	0.189		
IT					0.537*	0.521*
Trade					-0.025	-0.028
Finance					0.093	0.079
Manufacturing					0.152	0.138
Construction					-0.028	-0.042
Mining					-0.189	-0.228
Energy					-0.252	-0.273
Oil and Gas					0.966**	0.945**
Pharmaceuticals					0.478*	0.467*
Services					0.225	0.226
Number of observations	644	644	644	644	644	644
Overall R^2	0.0570	0.0575	0.095	0.095	0.239	0.0655

Table 3.15. Effects of Type of Listing on Company Valuation

Dependent variable is Tobin's Q. Rule 144a is a dummy variable that equals one for companies that issued a Rule 144a or Regulation S ADR. OTC is a dummy variable that equals one if a firm has issued a Level 1 ADR, traded over-the-counter. Exchange is a dummy variable that equals to one if a company issued an exchange-traded DR. ** indicates statistical significance at 5%; * indicates statistical significance at 10%.

	OLS (1)	Heckman (2)	OLS (3)	Heckman (4)
Intercept	2.882**	2.198	2.385**	3.589
Rule 144a	0.258**	0.259**	0.207*	0.207*
OTC, Level 1	0.528**	0.528**	0.379**	0.381**
Exchange traded	0.342*	0.342*	0.009	0.009
Sales growth	0.256**	0.256**	0.192*	0.191*
Size of government	-0.097	-0.038	-0.079	-0.183
Legal System	-0.069	-0.075	-0.043	-0.031
Monetary system	0.037	0.019	0.059*	0.091
International Trade	-0.269**	-0.269**	-0.309**	-0.311**
Labor market	0.127	0.171	0.163	0.085
Lambda		1.326		-2.336
IT			0.596**	0.596**
Trade			-0.032	-0.032
Finance			0.0712	0.071
Manufacturing			0.174	0.174
Construction			-0.135	-0.135
Mining			-0.133	-0.132
Energy			-0.051	-0.049
Oil and Gas			1.206**	1.208**
Pharmaceuticals			0.415*	0.416*
Services			0.334	0.334
Number of observations	644	644	644	644
R^2	0.1002	0.1003	0.2802	0.2803

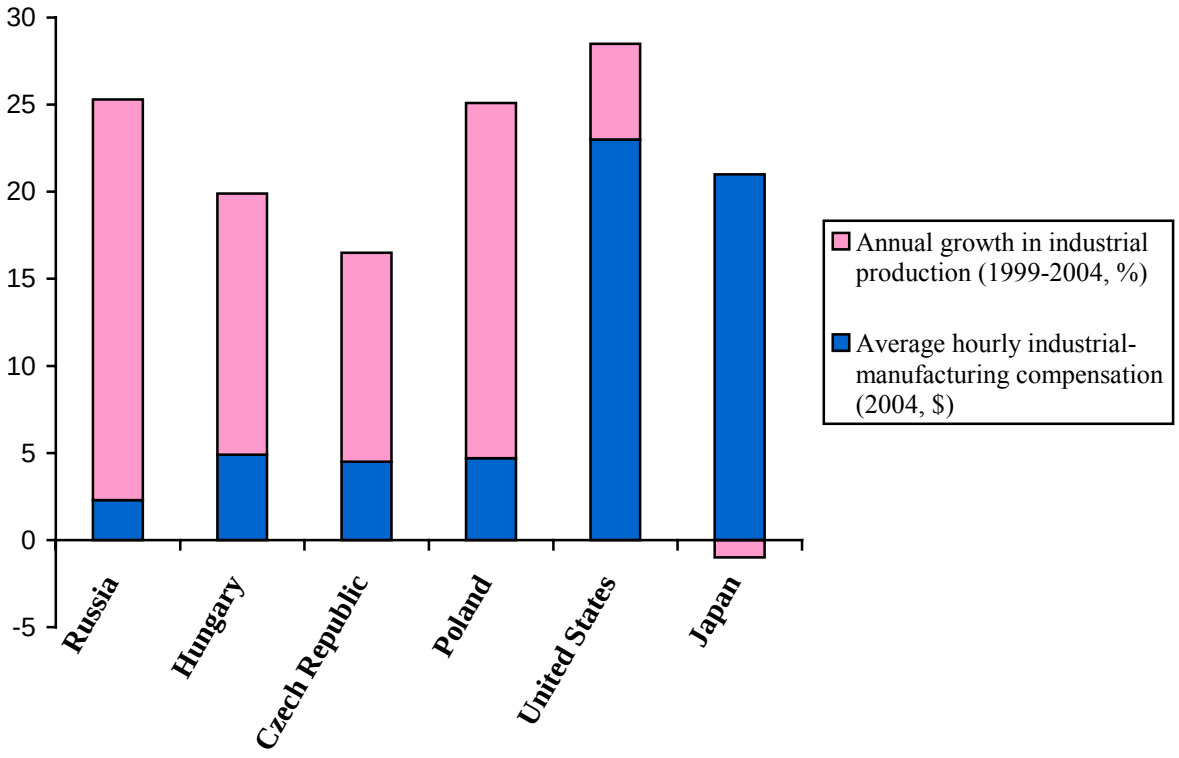
Table 3.16. Interactive Effects of the Listing Decision, Country Characteristics and Growth Opportunities

Dependent variable is Tobin's Q. Interactive indicator variables in specifications (1) and (2) are created by multiplying a listing indicator by each of the five index components. Interactive indicators of sales growth and cross-listing and legal system efficiency, growth and cross-listing are included in specifications (3) and (4).

	OLS	Heckman	OLS	Heckman
	(1)	(2)	(3)	(4)
Intercept	2.990**	2.699	2.966	4.243
	(4.15)	(0.38)	(4.11)	(0.59)
Listing variable	-1.099	-1.098	-0.771	-0.777
	(-0.78)	(-0.78)	(-0.54)	(-0.55)
Sales growth	0.241**	0.241**	0.339**	0.339**
	(2.90)	(2.89)	(3.30)	(3.30)
Size of Government	-0.123	-0.098	-0.127	-0.236
	(-1.38)	(-0.16)	(-1.41)	(-0.38)
Legal system	-0.184	-0.187	-0.188	-0.176
	(-1.49)	(-1.33)	(-1.52)	(-1.25)
Monetary system	0.093**	0.085	0.099**	0.134
	(2.94)	(0.44)	(3.12)	(0.69)
International trade	-0.297**	-0.297**	-0.299**	-0.301**
	(-4.73)	(-4.70)	(-4.78)	(-4.77)
Labor market	0.214	0.233	0.219	0.137
	(1.57)	(0.48)	(1.62)	(0.28)
Listing * Size of government	0.228	0.228	0.223	0.224
	(1.21)	(1.21)	(1.18)	(1.19)
Listing * Legal system	0.551**	0.551**	0.507*	0.507*
	(2.10)	(2.10)	(1.90)	(1.91)
Listing * Monetary System	-0.256**	-0.256**	-0.275**	-0.276**
	(-4.08)	(-4.07)	(-4.27)	(-4.27)
Listing * International trade	0.147	0.148	0.193	0.192
	(1.20)	(1.20)	(1.53)	(1.53)
Listing * Labor market	-0.396	-0.396	-0.434	-0.433
	(-1.45)	(-1.44)	(-1.58)	(-1.58)
Lambda		0.577		-2.474
		(0.04)		(-0.18)
Sales growth * Listing			-1.467**	-1.472**
			(-2.00)	(-2.01)
Growth * Listing * Legal System			0.232*	0.232*
			(1.67)	(1.67)
Number of observations	644	644	644	644
R^2	0.1272	0.1272	0.1344	0.1344

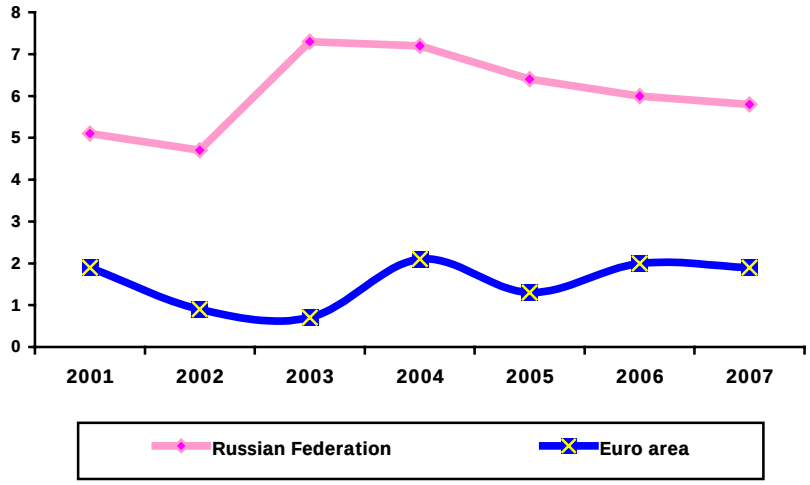
FIGURES

Figure 1.1. Annual Growth in Industrial Production and Average Hourly Industrial-Manufacturing Compensation



Source: The Boston Consulting Group, May 2006.

Figure 2.1. Real GDP growth rates in the Russian Federation and Europe



Source: IMF statistics, 2006

Figure 3.1. Average Tobin's Q of firms with a DR and firms without a DR

Average Tobin's Q is computed as the mean firm-year observation for a particular country, where the market-to-book values are averaged over four years for each firm, and divided by the number of firms in a country.

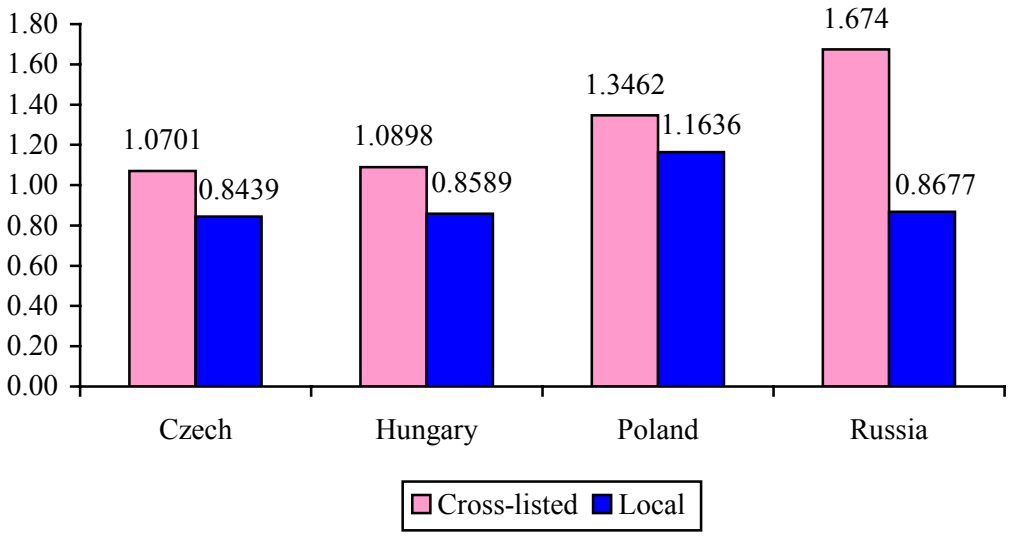


Figure 3.2. Industry Distribution of Companies

Figure shows industry distribution of the 166 sample companies from Central Europe and Russia. There are 29 firms from the Czech Republic, 34 from Hungary, 72 from Poland, and 11 from Russia.

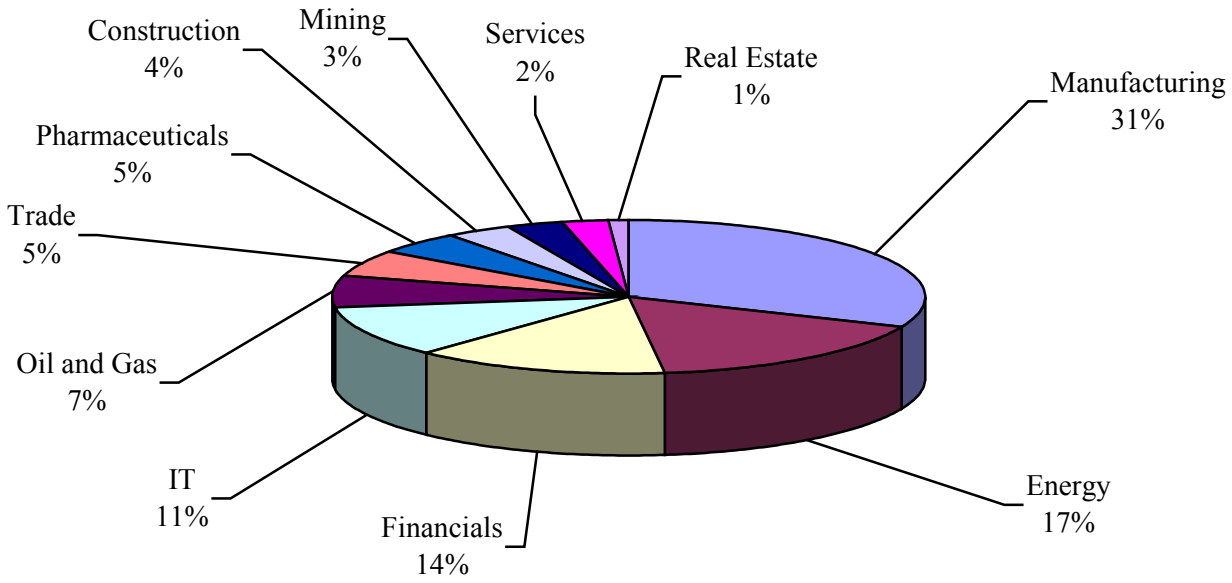
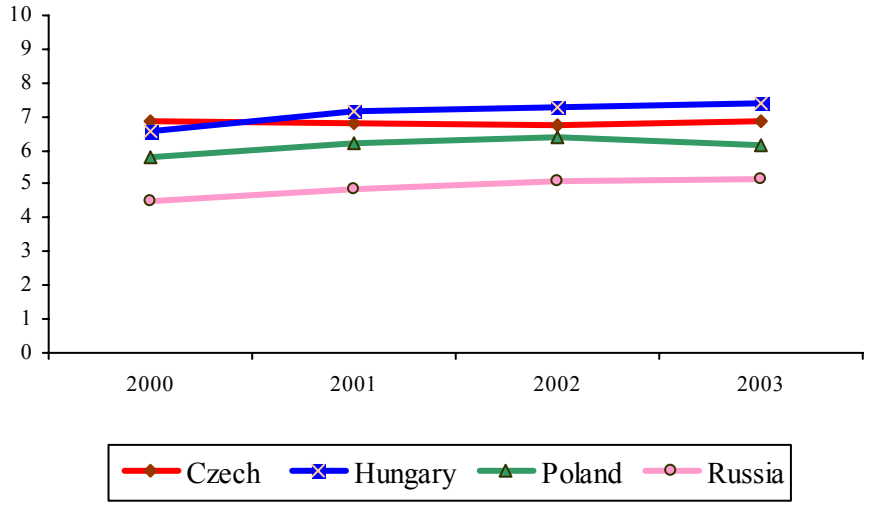


Figure 3.3. Index of Economic Freedom in Central Europe and Russia

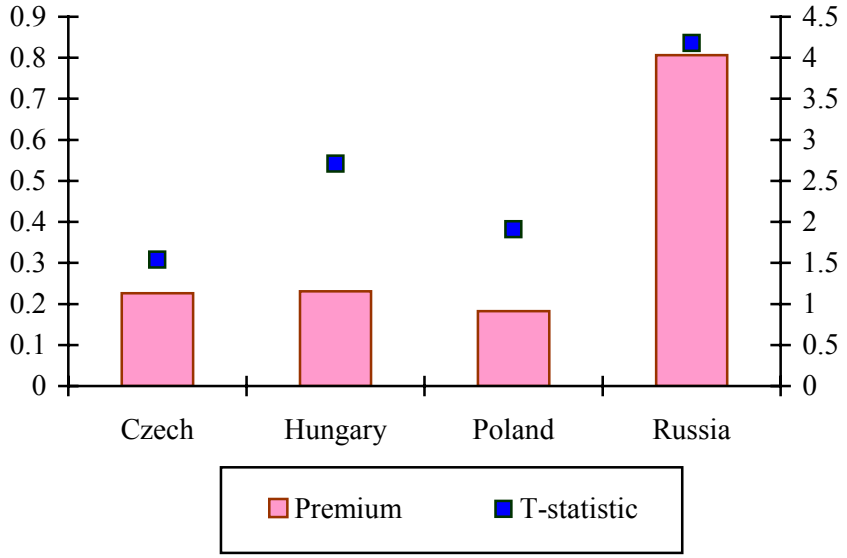
The figure presents the World Index of Economic Freedom from 2000 to 2003 for four countries in the sample. The Index is composed of size of government, legal structure and security of property rights, access to sound money, freedom to trade internationally, and regulation of credit, labor and business. There are 29 firms from the Czech Republic, 34 from Hungary, 72 from Poland, and 11 from Russia.



Source: Fraser Institute, Annual World Report, 2005

Figure 3.4. Cross-listing Premium Across Countries

This figure presents the results from within-country regressions that estimate the effect of cross-listing on Tobin's Q. Explanatory variables include a cross-listing indicator and a legal efficiency index. There are 29 firms from the Czech Republic, 34 from Hungary, 72 from Poland, and 11 firms from Russia.



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