

Modeling and Measuring Russian Corporate Governance: The Case of Russian Preferred and Common Shares

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Abstract:

This paper examines governance and liquidity explanations for the discount of preferred shares to common shares in the Russian market. Conflicts between shareholder classes may help explain the discount. However, for this to be the sole explanation the estimated models suggest that the magnitude of future expected adverse shareholder events would had to have been very high in 2000. These beliefs would then had to have undergone such a dramatic change that by February 2001 over half the discount disappeared. The paper also finds it difficult to document large enough liquidity differentials to explain the discount. Overall the evidence indicates that non-traditional explanations may be necessary.

JEL classification: F3, G3.

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...Russia has a strategic goal – to become a country that makes competitive goods and renders competitive services. All our efforts are committed to this goal. We understand that we have to solve questions pertaining to the protection of owners' rights and the improvement of corporate governance and financial transparency in business in order to be integrated into world capital markets.

Vladimir Putin's speech at the World Economic Forum in Moscow
(10/30/01)

It is widely believed by participants in the Russian market that corporate governance issues are at least as important as fundamental economic factors in the valuation of Russian securities. In fact, this is what makes the Russian markets so appealing for academic research. Governance in Russia presumably has a first-order, rather than a second-order valuation effect, an observation that may explain why many Russian companies look attractive based on various valuation metrics. For example, oil firms currently appear to be undervalued on the basis of the ratio of reserves to their stock price. These attractive valuations, however, are meaningless to minority shareholders if managers or a controlling shareholder block can transfer resources to themselves. Hence corporate governance issues have attracted considerable investor attention. One of the leading Russian investment banks, *Troika Dialog*, publishes a weekly newsletter *Corporate Governance Weekly*. The publication discusses changes in laws and regulations, reports legal cases, and discusses corporate events. Undoubtedly, their customers consider this information value-relevant.

The emerging awareness of corporate governance issues in the last two years has, perhaps, lead to some positive changes in the Russian corporate governance landscape. For example, there are now a few cases in which minority shareholders have successfully defended their rights. Nevertheless, a natural presumption about the primary determinants of share price in Russia is that issues of control far outweigh such measures of earnings and asset values – hence the quote from President Putin above.

This paper explores an odd empirical deviation from the law of one price between Russian common and preferred shares that might appear – at first – to be due to the relatively poor legal protections for minority shareholders in Russia. Russian common and preferred securities differ only in their relative proportions of each firm’s equity capital structure, and with regard to the type of issues on which they vote. In addition, preferred shares have a novel constraint on dividends that makes it easy to model their relative value to common. Unlike typical U.S. preferred stocks, which have a promised annual cash payment, the dividends of Russian preferred shares are legally bounded below by both the dividends to the common, and ten percent of the firm’s earnings. If, as normally assumed in equity valuation, the stream of future dividends represents all the benefits that can accrue to shareholders, then the common and preferred valuation ratio should be reversed - the preferred should always sell for *more* than the common. In fact, they almost never do. In this paper, we investigate whether this discrepancy may be the result either the potential for expropriation of one class of shareholders by another, or differences in liquidity.

From 1997 until the end of 2000 the common shares became ever more valuable relative to the preferred. Then over a four month period the gap closed to a large extent. It is well known that differential voting rights can account for large pricing differentials in some markets (Zingales, 1994 and 1995). However, a useful question is whether the pricing differential between voting and non-voting shares correctly estimates the *ex ante* value that can accrue to one class of shareholders.

This paper builds a simple model of expropriation and then evaluates it using current Russian company share prices and dividends. After fitting the model to actual transaction prices the resulting figures indicate that until recently the magnitude and timing of the preferred’s expropriation would have to have been so extreme as to be incredible – even in the context of Russia’s rough and ready

corporate environment. For those who insist on a pure corporate control explanation, this leaves the conclusion that extreme investor priors about expropriation had very large effects on the valuation of Russian securities up until the beginning of 2001. Then suddenly beliefs changed dramatically over a very short period of time which lead to a narrowing of the relative prices.¹ Of course, given the now relatively modest price gap between the common and preferred shares the remaining discrepancy may very well be due to corporate control issues. In fact, the current relative valuations may indicate the fraction of the original gap due to this issue.

Like corporate control liquidity differentials can cause seemingly similar securities to sell for very different prices. Relatively less liquid securities should have lower prices (i.e. have higher expected returns) than their more liquid counterparts (see Brennan and Subrahmanyam (1996) for evidence in this regard using U.S. data). Thus, the paper also tests whether the relative liquidity of the common and preferred shares might explain more than a small fraction of the discount. The results indicate that it cannot.

1 Russian Preferred Shares

When the Russian government privatized its industries, for many firms, it created two classes of stock. The first, common shares, are typical of those found in many western countries. The second, however, is relatively unique. At the time, the government wanted to protect each firm's employees, while simultaneously giving them a stake in their own firm. To do so, "preferred" shares were created and distributed. These shares are very different from those normally seen in the U.S.

¹While corporate control issues may not fully explain the discount this paper does not claim the unexplained part must be due to irrationality in the market. Indeed while that may be true, it may instead be that the price discrepancy arises from the potential for multiple market equilibria such as those found in Spiegel (1998).

and European markets in that they come with special voting and cash flow rights. The apparent purpose of these rights is to ensure that the preferred shares remain at least as valuable as the common. However, despite these protections the common nearly always sells for more than the preferred.

Russian companies are allowed to issue bonds, common stock, preferred stock, warrants and convertible bonds. For the purposes of this paper the preferred shares have two special rights of particular salience. First, most company charters require that preferred shares receive a dividend at least equal to some fixed percentage of the annual net profits, often 10%.² (Note, they differ from western preferred shares that typically offer a fixed annual monetary amount.) Second, the preferred shareholders must receive a dividend *at least as large* as the dividend given to the common shares.

A typical corporate charter such as that for Surgutneftegaz spells this out as follows:

The total amount of the dividend on each preferred share shall be fixed at 10 percent of the net income of the Company at the end of the last financial year divided by the number of stock which constitutes 25% of the company's share capital. If the amount of dividends paid by the Company on each common stock in a certain year exceeds the amount of dividends payable on each preferred stock, the amount of dividends payable on the latter must be increased to the amount of dividends payable on the common stock. The Company shall have no right to pay any dividends on the preferred stock otherwise than in the manner provided for by its Articles of Incorporation.³

² This, of course, means that the definition of net profits can be crucial to valuation. In recognition of the potential for concealing profits to the detriment of preferred shareholders, Russian regulators in the year 2001 "tightened" the definition of accounting profits. In fact, however, most Russian companies have been paying out, rather than avoiding, significant preferred dividends. See Table 1, which lists the dividends paid on common and preferred shares for nine firms.

³ Resolution on Issue of Securities Preferred Registered Stock of Open Joint Stock Company Surgutneftegaz, September 20, 1997.

Thus, relative to the common shares, the preferred shareholders have apparently been promised the larger cash flow stream.

The above discussion naturally leads to the question of just how much protection has been afforded the preferred shareholders. Cash flow promises are worthless unless backed up with sufficient control rights. Recognizing this, Russian company charters protect the preferred shares' dividends against splits and reverse splits. In other words, companies are not allowed to simply increase dividends to the common shareholders by a factor of ten by splitting each share of common ten for one. Other protections vary across firms. Some Russian companies simply pool all of the equity votes when determining if a particular measure has or has not passed.⁴ Other firms offer the preferred shareholders even more explicit protection. For example, the Surgutneftegaz charter states that in the event of proposed

. . . modifications or amendments to the Charter may affect the rights and interests of the first issue Preferred Stock owners . . . the decision has to be ratified by those owning two thirds of the Preferred Stock
...

With this clause in place, and sufficient legal protection via the courts, it would appear that the preferred shareholders should be protected against any value transfers to third parties.

Given the legal protections afforded to the preferred shareholders, why do they sell for less than the common? One obvious answer is that via clever legal maneuvering somebody will find a way

⁴ By law the preferred can only represent up to 25% of a firm's capital as calculated via the original par value of the preferred and common equity. This implies that even if the preferred shareholders unanimously oppose a measure it will pass if the common votes at least 2 to 1 in favor. On the other hand, anybody that owned 100% of the preferred stock and 1/3 of the common would have voting control. Thus, even in this case, it is not clear that control issues should either negatively or positively influence the value of the preferred shares relative to the common.

around even the strongest protections, thus draining value from the preferred to the common shareholders. Several international studies on voting rights confirm that control is valuable. According to Levy (1983), Rydqvist (1996), Horner (1988), and Zingales (1994) premiums are paid for voting control in Israel, Sweden, Switzerland, and Italy. Hanouna, Sarin, and Shapiro (2001) estimate the value of control for a sample of transactions in G7 countries. They report control premiums in the United States of approximately 30%.

It is important, however, to study specific mechanisms by which voting control translates into altered shareholder group cash flows since this ultimately determines valuation. Thus, this paper goes beyond a simple statement that voting rights account for the valuation discrepancy. Instead, it develops two simple models of expropriation and then evaluates them with current share price and dividend data. The estimated parameters indicate that until the end of 2000 if future adverse shareholder events were to explain the data, they would have to have been very strong and happen very quickly. Then, suddenly, over a four month period investors beliefs must have changed dramatically in these two dimensions as the relative price of the securities suddenly narrowed.

The paper's structured as follows: Section 2 describes the history and basic characteristics of the Russian stock market. Section 3.1 looks at the relative liquidity of the preferred and common shares. Section 3.2 examines several corporate control explanations for the observed common to preferred price ratios. Section 3.3.1 estimates a wealth transfer model, and Section 3.3.2 a takeover premium model. Section 4 looks at the related literature on the corporate control premium in other countries. Finally, Section 5 concludes.

2 The Russian Stock Market

2.1 History

Over the past five years, the privatization of the Russian economy has virtually undone the most famous nationalization of industry in history. In 1917, when most Russian corporations were acquired or seized by the revolutionary government, the domestic and international market in Russian debt and equity instruments was one of the most active in the world. It operated under a set of securities laws that had developed over the course of a century, beginning with the founding regulations of the Saint-Petersburg stock exchange in 1816. In the decades before the Russian Revolution, the control of much of the nation's natural resources and industrial assets were held by foreign and domestic investors, including oil fields, mines, railroads, tramways, electric utilities and banks, to name only a few. In the late 19th and early 20th century, in a manner surprisingly similar to America's own Gilded Age, Russia's eastward expansion and rapid development was financed by vigorous capital markets. All this changed with the expropriation of Russian assets by the State and the repudiation of much of the Tsarist debt by the new Russian Government.

With settlements of the Russian government debt in the early 1990's, Russia has returned to the global capital markets. By the same token, with the vigorous privatization of Russian state-run enterprises beginning in 1993, the State Property Committee (GKI) has overseen the transition of huge sectors of the Russian economy back to their pre-revolutionary status. The first steps taken in 1993 distributed the ownership of a large fraction of Russian enterprises directly to Russian citizens, and instantly established the need for a liquid securities market. Privatization continued until the Russian economic crisis in 1998, under a variety of auction, secured loan, and direct transfer programs that resulted in the creation of large-scale publicly traded companies, that, like their pre-revolutionary predecessors, have attracted the interest of foreign investors.

Russian securities regulators have been challenged to keep up with the pace of privatization. Security investors require enforceable property rights, laws against fraud, clear corporate rules, organizational transparency – in short, the entire framework of institutional rights and laws that have developed in the United States and other capitalist nations over the period since 1917. Despite starting virtually from scratch, Russian securities regulators have done a remarkable job in dealing with the pace of change, with the Federal Commission for the Securities Market taking the lead in seeking to create a positive environment for investment. However, the Russian market is so new that many issues have yet to be tested, despite the increasing sophistication of market participants and the increasing complexity of corporate restructurings.

2.2 Current Market

The majority of stock trading in Russia occurs on the floor of The Moscow Interbank Currency Exchange (MICEX) or through the Russian Trading System (RTS).⁵ MICEX began trading stocks in March 1997, and by the end of the year it listed 50 stocks from 33 different companies. In 1999 MICEX became the volume leader among Russian exchanges for equity trading. Equity trading on MICEX accounted for 53% of all equity trading in Russia in 1999. By the end of 1999 MICEX listed 174 stocks by 112 issuers. In the year 2000, the volume of equity transactions on MICEX reached 472 billion Rubles a six-fold increase against 1999. Such Russian blue chips as *Lukoil, Mosenergo, Rostelecom and Norilsk Nickel* trade on MICEX.

The RTS Stock Exchange is an electronic trading floor established in 1997 by leading Russian brokers and dealers to consolidate regional securities markets. RTS traces its origins back to the

⁵ Negligible amount of trading in stocks takes place on regional exchanges, - in Samara, Rostov, St. Petersburg, Nizhny Novgorod, and Ekaterinburg.

Russian Trading System - the first electronic trading system in Russia. It began operations in September 1995. Presently, RTS lists and trades all Russian blue chips and many regional firms.

Figure 1 plots the RTS Index and RTS daily trading volume over the period September 1, 1995 to August 31, 2001. The RTS Index is a value-weighted index computed by the Russian Trading System based on U.S. dollar prices of 63 stocks. The performance of the index was striking until the end of the summer of 1997. Russia appeared at the time to be a vibrant emerging market exhibiting high share price growth. Average daily trading volume grew from \$2,276,733 in 1995 to \$11.8 million in 1996 and reached \$36.6 million during the first half of 1997. The all time high of \$216 million in trading on one day also occurred on October 3, 1997 – over 100 times the average daily volume two years previously.

At the end of October 1997, the Russian stock market tumbled. The RTS Index lost 93% of its value, falling from 571.66 on October 6, 1997 to an all-time low of 38.53 on October 5, 1998. The crisis of 1998 not only destroyed the value of the Russian stock market, but also brought trading to a near halt. On August 13, 1998, the Russian market closed after the first hour of trading as the average market price dropped 6.5%. The average daily trading volume on RTS for the last six months of 1998 was \$8.9 million. There were many days in September and October when trading volume was below \$1 million. The least active day in the history of RTS was September 25, 1998 with the total volume of trading of only \$163,350! In short, Russia's new public capital market nearly ceased to exist.

The trigger for the 1997 crash was almost certainly the Asian currency crisis that began in the late Summer and early Fall of that year. Slumping energy prices during the period also hurt Russia's largest firms. The Russian government's debt crisis added to the problem, ultimately resulting in a

\$40 billion default on August 17, 1998. The Russian stock market eventually responded to the economic recovery of 1999. The RTS index gained nearly 200% in 1999, and dropped only 20% in 2000. The index gained 57% over the first eight months of 2001. Trading volume, however, has not recovered to the pre-crisis levels. The average RTS daily trading volume was \$22.2 million in 2000, and \$18 million in 2001, substantially lower than in 1997. Despite survival, the Russian stock market remains very small compared to the size of the economy. The market capitalization of the RTS Index stocks equaled \$52.92 billion as of October 25, 2001. According to *The World Factbook 2001* published by the CIA, Russia's Gross Domestic Product for the year 2000 is estimated at \$1.12 trillion. By comparison the same source estimates U.S. GDP to be \$9.963 trillion.

2.3 The Performance of Russian Securities - Allowing for Asynchronous Trading

While the RTS index is indicative of the Russian market's overall performance, for many of the calculations performed later on this paper, asynchronous trading issues make its use problematic. Many Russian securities trade only a few times a year; especially those issued by smaller firms. While this has little impact on the RTS index (since it is value weighted) it can pose a problem when looking to update prices in general. This problem can be overcome via the use of a repeat sales index, a common technique for estimating the value of real estate. Roughly a repeat sales index using multiple observations on the same asset to calculate that asset's return over time. Returns are then averaged cross sectionally and intertemporally via a least squares regression to produce an index.⁶ One important caveat is that the index is equally weighted. **Figure 2** displays the results with the common and preferred indices normalized to 100 as of May 1997. Due to the dramatic price changes in the Russian stock market one needs to be careful when examining the graph. While it appears the

⁶For details see Goetzmann and Spiegel (1995).

preferred closely track the common, as of April 2003 the preferred index is 16% higher than the common index.

The repeat sales index captures the run up and subsequent '87 market crash in the Russian stock market. Since the preferred stock data only allows for the creation of an index starting in 1997 there is a smaller run up, but the crash is equally dramatic. The index goes from a peak of 146 to a low of 4.6! Separate indices were also created by industry for telecom, oil and gas, energy, and industrial firms as well as with and without the eight (large capitalization) companies listed in Table 1. Since dividing the data by industry and/or eliminating the eight Table 1 companies produce similar patterns the results are not displayed. All peak in 1997 and then crash with a slight rise thereafter. While telecom and energy stocks display the largest gains and losses all four industries reflect the impact of the pre 1997 price run up and the subsequent market crash.

2.4 The Size of the Russian Market in Preferred Shares

Table 2 presents descriptive statistics indicating the importance of the preferred share market in Russia. The data was retrieved manually from the archive maintained by the RTS. The RTS Stocks Archive includes all stocks that were, at some time since September 1, 1995, listed on the RTS. There are 909 stocks in the archive. Of these 651 (72%) are common, and 258 (28%) preferred. There are 251 companies that have common and preferred pairs. For some of these companies, however, there are no trades for either the common or the preferred in the database. The remaining 154 companies have, at some date at least, had both common and preferred listed on RTS and recorded some trades for both classes of shares. Another measure of the importance of preferred shares is their relative trading volume. During the period from September 1, 1995 until August 31, 2001 trading in common and preferred shares issued by firms with both classes of stock accounted

for 73% of all RTS trading. Preferreds are a small portion of the index by capitalization, however. As of October 25, 2001 there were 63 securities in the RTS Index 18 of which were preferred stocks and they accounted for 5.55% of the index's market capitalization. Those companies that have both classes of shares account for 65.21% of the index market capitalization.

2.5 The Relative Price of Russian Common and Preferred Shares

As noted earlier, Russian law states that the preferred shares must receive a cash flow at least as large as the common. Thus, it appears that the price ratio of the common to the preferred should never exceed unity. One can test this relationship by looking at the following eight Russian companies: *Unified Energy System (EESR)*, *Lukoil Holdings (LKOH)*, *Norilsk Nickel (NKEL)*, *Rostelecom (RTKM)*, *Surgutneftegas (SNGS)*, *Kubanelectrosvyaz (KUBN)*, *Svyazinform of Chelyabinsk (SVIC)*, and *Tatneft (TATN)*. These firms have been selected since they are the most actively traded stocks with both preferred and common shares. Many of these firms also trade in U.S. via ADRs. As of October 25, 2001, common and preferred shares of these firms accounted for over 53% of the market capitalization of the RTS Index.

Figure 3 shows the equally weighted index of the common to preferred share price ratio for the eight firms listed above. Wherever possible the price ratio comes from each security's daily closing price. When such prices are unavailable the price is estimated by updating the last known price by the return on the repeat sales index for that firm's industry over the time period in question. Thus, if the last available transaction took place at a price of \$10.00 and since then the industry index has gone up by 1%, the estimated price is set to \$10.10. Due to the relative liquidity of these stocks

such estimates are needed relatively rarely.⁷

Notice that throughout most of 1999 the value of the common typically lies between three and a half to four times the value of the preferred. There is also a rather steady upward drift in the ratio from 1997 until 1999 which corresponds in large part to a period in which the Russian security's market exhibited negative realized returns.

Adding small stocks to the common-preferred price ratio index produces an even more extreme pattern as can be seen in **Figure 4**.⁸ With the addition of the small stocks the price ratio peaks at a value just under 7 at the end of 1999 and then falls steadily to its current value of about 1.7. Also note the dramatic drop in the ratio starting in July 2000 when it goes from 6.8 to 2.8 in just half a year.

3 Explaining the Common/Preferred Price Ratio

3.1 Liquidity

Liquidity differences across securities may offer the simplest potential explanation for the observed common-preferred price ratio. If the preferred are less liquid they will presumably sell for less, even if they have higher expected future cash flows. Table 3 presents some evidence on this issue from the time period when the ratio took on its maximum value (the end of 2000 to early 2001). Panel A shows that the volume of trade in the preferred shares for each firm is significantly lower than the volume of trade in the corresponding common. In terms of total dollars traded, the common

⁷Implicitly this assumes that each firm in an industry has the same "beta" relative to its industry index. While this may not always hold, it (or a similar structural assumption) is needed to employ the repeat sales methodology for the index's construction.

⁸As in the previous figure, whenever transactions prices are unavailable they are updated via the repeat sales index this time using the index for their industry.

shares experience two to ten times as much volume. However, these figures converge to a large degree when divided by the market value of each class.⁹ Thus, trading volumes in each security class appear to be roughly proportional to their market value – an expected result if the relative liquidity levels are similar.

Another way to look at the liquidity issue is via a comparison with U.S. securities. Table 3 Panel B reports the results from a matching sample of U.S. firms. This sample contains the ten stocks closest in market value (five above and five below) to each Russian security in our sample. That is, each Russian firm has ten matching U.S. firms for its common and another ten for its preferred. Not too surprisingly, the U.S. firms are a lot more liquid than their Russian counterparts. For many of the comparison groups the U.S. market has almost 100 times the trading volume.

While the U.S. market is clearly more liquid overall, if one looks across pairs another pattern emerges. For any one firm, the U.S. matching sample for the common tends to have considerably more liquidity (relative to market value) than the set used to match the preferred. For example, the Rostelecom ratios for the common and preferred trading volumes (relative to market value) are 0.352 and 0.263 respectively. For the matching U.S. sample they are 3.001 and 1.361. Thus, many of the Russian preferred issues appear to be have more trading volume relative to their common counterparts than one would expect from an examination of U.S. companies with equivalent market values.

Although it is commonly accepted that liquidity is relevant to valuation, no researcher has ever suggested that the liquidity premium for small stocks in the U.S. is anywhere near the levels needed

⁹One caveat - the entire analysis ignores the U.S. volume in ADRs and volume in other non-domestic securities markets, which may substantially influence a particular trader's ability to get into or out of a position.

to reconcile the prices of the Russian preferred and common shares. Consider then Table 3 as a comparison of the trading volume in small U.S. companies (those matched with the Russian preferred shares) and large U.S. companies (those matched with the common). The table suggests that liquidity drops off with size somewhat faster in the U.S. than in Russia. Thus, it seems reasonable to conjecture that the liquidity premium for small U.S. companies puts an upper bound on how large a liquidity premium can exist in the Russian market for preferred shares. Overall, it seems unlikely that liquidity can explain more than a small fraction of the observed Russian preferred share discount.

3.2 Corporate Control

3.2.1 Should the Common Carry a Control Premium?

Typically people carry over from western stocks the idea that common shares should carry a control premium relative to the preferred shares in the same company. For western securities this makes economic sense since the common typically have the ability to vote out management, rearrange the firm's capital structure, and otherwise exercise control over the firm in ways that the preferred do not. However, for Russian companies this intuition does not necessarily hold.

First, as noted earlier, Russian preferred shares are entitled to vote on any number of issues. Second, the *preferred* shares appear to offer a perfectly legal way for an investor to acquire control of the firm's cash flows at a substantial discount. While the preferred are guaranteed at least as large a cash flow as that given to the common, the common shares are not guaranteed anything. Now consider a typical firm in which 25% of the equity is in the form of preferred stock. Imagine that an acquirer purchases all of the preferred and half of the common. Next the acquirer declares that in the future no cash flows will accrue to the common only the preferred. Such a policy is not only within the boundaries of the current set of corporate charters but conforms with the current facts. That is,

many firms now pay a steady dividend to the preferred (as they are required to do) and nothing to the common (as they have the right to do). Just as importantly, in this example, the acquirer has taken 100% of the firm's value for himself while owning less than 100% of the equity.

Expanding on the above example, it may even be possible to acquire a firm for *only* the value of the preferred. If an acquirer obtains all of the firm's preferred shares and can credibly convey the plan outlined above to the market, then the price of the common shares should fall to zero. To see why consider the problem faced by the owner of a common share. Imagine the acquirer offers to pay a small amount for the shares (say one ruble). The current stock holder can then either take the one ruble, or hold out. If he holds out and the acquirer is successful then the common is worth zero. Thus, if the stock holder believes the acquirer will be successful he will sell and thus the acquirer will in fact be successful.¹⁰ Whether or not one believes in the feasibility of this scenario, the point is that it is not at all clear why given the rules governing Russian securities the preferred should not in fact contain a control premium relative to the common.

3.2.2 *Control Premiums versus Absolute Prices*

For corporate control issues to explain the price discrepancies between the Russian common and preferred shares then at some point in time those purchasing the common shares must expect to receive a larger cash flow than those buying the preferred. This differs from the simple statement that corporate control issues have a large impact on security prices.¹¹ For example, imagine that

¹⁰This is similar to the problem faced by a shareholder in a two part tender offer. See Bradley, Desai, and Kim (1988) for a detailed discussion.

¹¹Black (2001) concludes that corporate governance issues may explain why Russian companies have market values that are low relative to their fundamentals when compared with western pricing patterns.

management can expropriate a large fraction of a firm's cash flows.¹² That in and of itself should not cause the preferred shares to sell for less than the common. For better or worse, the siphoned off cash flows do not aid ordinary investors that cannot expect to share management's private benefits. If such investors are the marginal shareholders then corporate control may strongly impact absolute values across security classes. However, such issues can only affect relative prices by somehow diverting future cash flows from one class to the other. For the common to sell for more, its marginal holder must expect to reap cash flow benefits or in a competitive equilibrium the price will not be bid up past that of the preferred.

3.2.3 *Who is the Marginal Shareholder?*

If marginal shareholders cannot potentially control the firm then market prices must reflect the direct cash flows going to the holders of each security class. However, if market prices are set by investors that either currently control the firm, or might control the firm then direct cash flow values may be of secondary importance. Rather, these investors are likely to view the indirect cash flows that can accrue to controlling shareholders as the dominant issue. Such indirect cash flows

¹²Even this is becoming more difficult as there are emerging ever more binding restrictions on what can be done to make this happen. For example, in 1999 Viksunsk Pipe tried one of the widely used tricks for diluting minority shareholders. In this ploy, the Board at the Annual General Shareholders' Meeting (AGM) or Extraordinary General Shareholders' Meeting (EGM) of the company authorized a secondary issue of common shares, to be placed with insiders via closed subscription, which dilutes the common. Shareholders opposed to the issue were offered a redemption price that was substantially lower than the price, at which the new issue is placed, P_{pl} . Minority shareholders could not participate in the subscription, but they also did want to sell their shares at an artificially low price. Viksunsk Pipe offered prices set at $P_{pl} = \$10.7$ and $P_{red} = \$3$, where P_{red} is the redemption price. Dissenting minority shareholders consolidated 9.4% of the charter capital and demanded that the company redeem their shares at a fair price. The shareholders ultimately won the battle, and reached an agreement to put their shares to the company at \$10 per share. While this is only one example, it illustrates the kind of corporate conflicts and legal changes that are happening in Russia right now.

include obvious perks like above market salaries, and less obvious ones such as the ability to force the firm to buy (at inflated prices) raw materials from another firm held by the controlling investor.

To help determine whether most market transactions are between large or small investors data was collected on all large block transactions in Russian publicly traded companies from 1996 through 2002, from the SDC International Database. According to Russian officials in the Federal Commission on Securities (the Russian SEC) any trade involving over 1% of the outstanding voting shares in a class is supposed to be reported. For obvious reasons we cannot be sure this always happens. Nevertheless, many are reported and thus while Table 4 may not be an exhaustive list of such transactions it seems likely to be at least broadly representative.

The total number of block trades comes to 56 with a per year low of four in 1998 to a high of thirteen in 2002. For each transaction Table 4 provides the date, a brief description of what was traded, the company involved, what share classes the company had outstanding, the firm's stock ticker, the transaction price, and the last market price prior to and after the block trade's date. For many of the transactions the public records do not contain the price at which the shares were transferred. For other many other firms the stock trades so rarely that either there are no recorded trades prior to and/or after the block's trade date.

For twelve of the transactions the block trade is the only known trade in the firm's stock. Of the remaining 44, there is some evidence that block trades tend to occur prior to the onset of exchange trading. There are eight firms with a market transaction after the block trade but not before, while there are only three firms in which the reverse is true (p value of .045). Of particular note for this paper's analysis only three of the transactions occur among those listed in Table 3. Two of those took place in 1996 (the first year for which data exists) and the third in 1998. Furthermore,

the block trades are for quantities that far exceed those on the exchanges. The NKEL block trade involved \$5.29 million worth of securities while as Table 3 shows the average trade on the exchange comes to only \$73,200, or 1.4% of the block's size. The magnitudes are similar for SNGS. The block trade came to \$90 million while a typical exchange trade is only \$55,152, or .06% of the block's size. In sum, the exchange trades are of magnitudes that are far smaller and occur far more frequently than those that major blockholders appear to engage in.

Table 3 provides additional evidence that the trades on the Russian exchanges are not driven primarily by investors that are likely to attempt to take control of the firm. For the matching set of U.S. firms the average trade size (as a fraction of market value) exceeds that for its counterpart in each and every case. To our knowledge nobody has ever claimed that a typical U.S. transaction takes place among potential controlling interests. Given these facts, it seems unlikely that the prices on the Russian exchanges are set by controlling or potentially controlling shareholders.

3.3 Cash Flow Models in Which the Common is Worth More than the Preferred

For an ordinary investor in corporate securities the common shares can only be worth more than the preferred if there will exist cash flows that go only to the holders of the common stock. There are two ways for this to happen. The first is simple expropriation. At some time in the future the common may discover a scheme by which they can divert the firm's profits to themselves. This is a very general statement, as it does not matter how this diversion takes place. For example, a managerial group may decide to take the firm private by buying out the common at a premium. They can then potentially leave the preferred with nothing by "appropriately" managing the firm.¹³

¹³If a managerial team can do this one is then left with the question of why they need pay a premium for the common. An offer similar to a two part tender offer should enable the buyers to obtain the common for its (low) post-takeover value.

Alternatively, the common may simply find some loophole in the law that allows them to pay themselves without making similar payments to the preferred. From a modeling perspective the critical issue is that any transfer scheme leaves the firm's total value unchanged. Thus, however the expropriation comes about, the model must explain the current set of market prices without changing the firm's total value.

A second way in which the common can benefit while the preferred do not is via a takeover of some sort. Under this scenario a future bidder decides to purchase the common at a premium but not the preferred. In terms of explaining the current market prices a takeover model has the advantage of allowing for a potentially unlimited present value of the future cash flows. Thus, the reasonableness of any such explanation must lie with how large a premium the potential bidder must pay and how soon relative to the history of such events.

Intuitively, one might think that either of the above models can easily fit the current relative market prices. After all, one can justify any price ratio by simply declaring that the market believes somebody will buy out the common at some value and then somehow renounce the preferred shares. While that may initially look appealing, such a scenario will not fit the current market prices. The fact is the preferred is worth quite a bit and thus any model has to allow for that. Another issue is the likelihood that the market believes a particular expropriation scenario will happen to nearly every single one of Russia's dual class firms in the next very short period of time. One can of course address the latter complaint by pushing back the date at which the expropriation will take place. But this runs into the problem that the preferred receive a fairly substantial dividend flow each year while the common receive relatively little. If the expropriation date takes place too far into the distant future it will not matter what happens; the preferred by dint of their accumulated cash flows will still

be worth more today. Because these conflicting requirements make it difficult to divine whether or not the current market prices are easily reconcilable with corporate control issues the next two sections construct simple models within which this topic can be examined.

3.3.1 *A Model of Direct Wealth Transfers from the Preferred to the Common*

Consider a simple perpetual growth model, modified to allow for the possibility that at some date in the future cash flows may be diverted from the preferred shares to the common. How this diversion takes place is irrelevant. What is important is that the diversion neither adds nor subtracts from the firm's total value. Thus, everything from dividend transfers to management buy outs can be accommodated within this setting.¹⁴

Define D_c as the total dividend paid out to the common shareholders and D_p the dividend paid out to the preferred shareholders. Let the payout ratios for each class of shares equal $\gamma_c = D_c/E$ for the common and $\gamma_p = D_p/E$ for the preferred, where E equals the firm's next period earnings. Since the model assumes that the firm grows at a constant rate (g), it is natural to assume that it arises from a constant "plowback" rate of the firm's earnings (E) into new capital, $E(1-\gamma_c-\gamma_p)$. Let ROE represent the firm's return on equity, then $g = ROE \times (1-\gamma_c-\gamma_p)$.

Absent issues of expropriation, the ratio of the price of the common to the preferred will simply equal the ratio of their current dividends. However, under the hypothesis that control issues explain the relative pricing of the common and preferred shares the model needs to allow for future transfers of cash flows. To do so, assume that at some date T the preferred shareholders will have their shares swapped for shares of the common. Let α represent one minus a swap ratio of common

¹⁴The next section allows for diversions that also increase the firm's total value.

shares for preferred shares.¹⁵ A value of zero implies a one-for-one stock swap in proportion to the dividends being paid to each class (no expropriation) while a value of one implies full expropriation of the preferred shareholders.

Under the above scenario the preferred shareholders earn $\gamma_p E(1+g)^{t-1}$ in period $t < T$. From date T onward they earn $(1-\alpha)\gamma_p E(1+g)^{t-1}$, the rest going to the common shareholders. Some simple manipulations of the annuity and perpetuity formulae (assuming a constant discount rate r) yields a valuation equation for the preferred shares of

$$P_p = \frac{\gamma_p E}{r-g} \left[1 - \alpha \left(\frac{1+g}{1+r} \right)^T \right] \quad (1)$$

Similarly, the common shareholders earn $\gamma_c E(1+g)^{t-1}$ in period $t < T$, and then $(\gamma_c + \alpha\gamma_p)E(1+g)^{t-1}$ so their shares are worth,

$$P_c = \frac{E}{r-g} \left[\gamma_c + \alpha\gamma_p \left(\frac{1+g}{1+r} \right)^T \right]. \quad (2)$$

Thus, the price ratio of the common to the preferred equals

$$\frac{P_c}{P_p} = \frac{(\gamma_p + \gamma_c)(1+r)^T}{\gamma_p [(1+r)^T - \alpha(1+g)^T]} - 1. \quad (3)$$

Since the model contains four free parameters, one can now see how the values of g and T vary with each value of r and α . Before going to the numerical analysis note that the growth rate only

¹⁵In fact, some preferred shares are convertible into common at the will of the company. A notable example is the conversion of Norilsk Nickel which redeemed one class of convertible preferreds 1 for 1 with common shares.

enters the equation in terms of the form $[(1+g)/(1+r)]^T$. Thus, varying α will not influence the solution to g , only the solution to T .

Using equation (3) take Surgutneftegaz as an example. In 1999, investors received \$0.74 per 1,000 shares of common and \$3.19 per 1,000 shares of preferred.¹⁶ Assuming no expropriation (either $\alpha = 0$, or $T = \infty$) the ratio of the value of the preferred to the common shares should be 3.19/0.74 or 4.3. Instead, the preferred typically selling for less than half the common. On March 22, 2001 (a typical day) the preferred sold for \$0.1115 and the common \$0.23125, or a ratio of 0.48.

Table 5 displays the fitted value for g and T given various values of r and α for eight firms with enough contemporaneous price and dividend data to meaningfully calculate the model's values. The table shows that, in 2000 if the expropriation rate equaled 60% or *less* than at the then current market prices, it paid to short the common stock and use the proceeds to purchase the preferred shares. Even with an expropriation rate of 75% for three out of the eight firms the event that would cause this wealth transfer needed to occur within six years to justify the then current relative market prices. Of course, sophisticated investors in Russian shares were more equipped than we to judge the reasonableness of these assumptions. But, even in the fluid regulatory framework of the modern Russian securities markets, such expropriation assumptions would seem to have been extremely dire and two years later have yet to materialize.

One item Table 5 underscores is the close tie between the expropriation level and date. For the most part, changes in the interest rate impact the firm's estimated growth rate and not the

¹⁶At the end of 1999 Surgutneftegaz had 23,725,994,705 common shares outstanding. It then registered an additional 12 billion shares on June 26, 2000 and paid 1999 dividends on these as well. On the preferred side the firm had 7,701,998,235 preferred shares outstanding. This implies a total payment to the common shareholders of \$26,437,236 and to the preferred of \$24,569,374.

expropriation date. Conversely, changes in the expropriation rate have a dramatic impact on the expropriation date.

Now compare the results using 2002 prices. The much narrower price differential allows the expropriation model to produce much more reasonable estimates. Nevertheless, even with a 60% expropriation rate the market needs to anticipate that such an event will occur within four years for half the firms. More to the point, the expropriation event will *never* occur for either LKOH or NKEL as they swapped their preferred for common shares at the rate of one-for-one in 2001. Still, for the remaining firms if one is willing to increase the expropriation rate to 75% then the event date is pushed out to at least four years for every single firm.

There are a number of ways to interpret Table 5. Based upon the model it is clear that an anticipated expropriation of value from the preferred to the common cannot easily explain the market prices as of 2000, but might explain the prices prevailing in 2002. One possible explanation is that the model is too simple and the results thus unlikely to be meaningful. Undoubtedly the model is too simple. However, its assumptions are fairly flexible. While it cannot capture expected year-to-year fluctuations in cash flows, the growth rate can be set to reflect the overall trend. Furthermore, the point is not to produce an exact estimate of the market's beliefs. Rather, the point is to get a "ball park" estimate of the type of events and the dates by which they would have to occur to explain prevailing prices. Even if the figures are off by a factor of two or three it would be difficult to reconcile the 2000 prices with a pure expropriation scenario, but not the 2002 prices.

Another explanation for the figures in Table 5 is that anticipated expropriation causes Russian common shares to sell for at most 1.5 to 2.0 times the value of the preferred, and that any ratios larger than that are due to some other factor. Under this explanation the narrowing in prices between

the common and preferred in late 2000 to early 2001 was due to the elimination of these other factors from consideration.

3.3.2 *Expropriation via Takeovers*

Recent mergers, such as the 1999 acquisition of the oil company Komitek by Russia's largest oil firm Lukoil, have involved swaps of the acquiring firm's preferred shares for the acquired firm's common (and presumably their preferred) shares. If the bidding firm can purchase the target's common shares for more than the preferred then this may explain the observed relative prices, an event not unheard of in Russia. For example, in July of 1999 YUKOS released the ratios at which it proposed to swap its shares for those of its three subsidiaries: *Yuganskneftegaz* (YFGA), *Samaraneftegaz* (SMNG), and *Tomskneft* (TOMG). Common shareholders in the subsidiaries could swap their shares for those of the parent company *YUKOS* at the following ratios: 7 YUKO for 1 YFGA, 4 YUKO for 1 SMNG, and 3 YUKO for 1 TOMG. Preferred shares in each subsidiary could be tendered for *half as many* YUKO commons. According to *Troika Dialog*, YUKOS valued its shares at 6 rubles (\$0.25) per share. This implied that YFGA was valued at \$1.75, SMNG at \$1.00, and TOMG at \$0.75. *Troika Dialog* also reported that "an independent appraisal commissioned by shareholders produced the following fair value estimates per share: YFGA - \$11.25, SMNG - \$1, TOMG - \$8.5."¹⁷ Whether or not common shareholders of the three subsidiaries were given an attractive offer may be debatable. Still, preferred shareholders were offered only half as much.

Prior to looking at the formal model the first question that needs to be addressed is the frequency with which mergers and acquisitions take place. If takeovers are common then that makes it much easier to attribute the 2000 market prices to projections about such events. On the other

¹⁷ *Bulletin # 43 On Corporate Governance Actions*. Troika Dialog. 15 July 1999

hand, if takeovers are relatively rare events then one might question whether the market truly believed such activity would dramatically increase in the near future. Table 6 lists the total number of mergers per year since 1995. Altogether there have been 14 and no more than 5 in any one year. Since there are 909 companies in the RTS archive, this means that over a eight year period only 1.5% were bought out. Assuming these trends continue the implied hazard rate leads to the conclusion that a typical firm's investors can expect to see their firm purchased in an average of 519 years.

Additional evidence against the hypothesis that the relative price of the common and preferred shares in Russia is due to potential takeovers can be found in Table 7. That table displays the size of the sample firms listed in Table 3 in terms of their revenues and total assets. Among the fourteen firms purchased in the 1995-2002 period the *largest*, by assets, was *Noyabrskneftegaz* an oil producer with total assets of 22,577.099 million rubles in 2000. Among the eight companies that this paper studies in detail there are only two firms with smaller asset values. They are *Kubanelectrosvyaz* (KUBN) with 2,803.706 million rubles in assets, and *Svyazinform of Chelyabinsk* (SVIC) with 3,324.893 million rubles in assets. The six other firms, however, are much larger than the largest firm acquired in Russian corporate history. The assets of *Surgutneftegaz*, for example, were 351 million rubles in 2001, which is 15 times larger than the figure for *Noyabrskneftegaz*.

A similar picture emerges when revenues are used to measure size. The largest acquired company is *Nizhny Tagil Metal* with revenues of 626.7 million dollars in 2001. Among the eight firms in Table 3, four have smaller and four larger revenues. However, once again the largest of the sample firms dwarfs the largest firm ever acquired. For example, in 2001 *Surgutneftegaz* reported revenues of 5 billion dollars, which is 8 times larger than the revenues of *Nizhny Tagil Metal*.

Based upon the historical data expectations of future merger activity seems unlikely to impact

today's market price by more than a small amount. Mergers are just too rare, and involve firms that are much smaller than those examined here. However, it is of course possible that investors' expect future merger activity to both increase and involve larger firms. To test whether the beliefs implied by this explanation are reasonable start with the perpetual growth model developed in Section 3.3.1. Now, drop the assumption that at date T a direct wealth transfer takes place, and replace it with the assumption that a takeover occurs instead. Further assume that the common shareholders can capture *all* of the acquisition premium from the takeover. Now, the only difference between the two share prices is the expected discounted future value of the per-share acquisition premium. Thus, the preferred's value equals:

$$P_p = \frac{\gamma_p E}{r - g} \quad (4)$$

and the common's:

$$P_c = \frac{\gamma_c E}{r - g} + m \frac{\gamma_c E (1 + g)^T}{(r - g)(1 + r)^T} \quad (5)$$

where m equals the takeover premium, and T the takeover date. The price ratio can thus be expressed as

$$\frac{P_c}{P_p} = \frac{\gamma_c \left[(1 + r)^T + m(1 + g)^T \right]}{\gamma_p (1 + r)^T} \quad (6)$$

There are again four free unobservable parameters g , r , m , and T .

Table 8 displays the fitted values of T and g for various values of m and r . Under reasonable

assumptions it seems possible to use a takeover premium model to explain the structural relationship between preferred and common shares for about two firms using year 2000 prices and six firms using year 2002 prices. For the remaining firms the results generally indicate that even if a takeover were to occur in the very near future the preferred shares offer the better investment value.¹⁸

Table 8 also includes the implied price-earnings ratio at which the takeover would occur under the model's assumptions.¹⁹ In many cases they seem too low, and when they are not then T seems large enough to explain the pricing discrepancies as takeover premiums. However, this hides a number of faults. First, earnings in Russia have been growing at an anemic rate. Thus, given the historical data, the purchaser is buying a cash flow that seems as likely to go down as up. Second, earnings growth has been weak despite relatively low payout ratios. It is this combination that makes it difficult for the model to explain the data under reasonable assumptions. The current holders of the equity appear to be paying a very high price, for what seem to be limited immediate cash flows, and future cash flows will thus need to depart from the historical pattern of low growth.

Still, it is somewhat disturbing that based upon year 2000 prices the model produces such low predicted price-earnings ratios upon the implementation of a takeover (although this problem largely disappears under year 2002 prices). To rectify this, Table 9 calculates g and T under the assumption that each firm will set γ_c equal to γ_p , the maximum allowed by law, starting immediately and continuing into the future. This departure from historical precedent allows the model to produce

¹⁸Note that the fitted values are set to rationalize today's price. Thus, it is not the case that the results are due to a systematic undervaluation of the common stock's future cash flows absent a takeover. Rather the model produces numbers such that both the takeover payout and the future cash flows discount to the current market price.

¹⁹Given the model's assumptions this ratio is independent of time, since the expected takeover price grows in proportion to the firm's projected earnings.

seemingly more reasonable price-earning takeover ratios using much lower takeover multiples. While the estimated values of T are somewhat better using either 2000 or 2002 prices, they are still far below what one would infer from extrapolating the historical data. In those cases where they are not the estimated price-earnings ratio for the takeover price is far higher than what one normally sees. In short, if future merger activity explains the observed market price ratios as of 2000, then people must have expected a tremendous increase in the rate at which Russia's largest firms are acquired; an event that has yet to occur. Using 2002 data the takeovers model appears to do somewhat better, but it still seems unlikely to explain more than a very modest fraction of the observed price discrepancy between the common and preferred shares.

3.4 Combining Explanations to Explain the Common-Preferred Price Ratio

First, it is worth reiterating that the analysis contained here does not imply that corporate control issues cannot explain any of the price discrepancy between the common and preferred shares as of the winter of 2000. However, it does appear that no single corporate control issue can explain more than a small fraction of it. This, of course, leaves open the possibility that a combination of control issues may fair substantially better.

While it is true that a combination of control issues helps, it does less than one might think. The models examined here assume that some control event takes place by some time T . Thus, multiple control issues help by increasing the critical date. In this case one can claim that control issues explain the data if $T_{\max} = \max\{T_1, T_2, \dots, T_n\}$ is large enough to be reasonable. Take SVIC as an example. In this case $T_{\max} = \max\{0, 0, 0, \dots, 0, 33, 35, 36\} = 36$. That would seem to make it possible to explain the price ratio of SVIC stock by combining explanations. However, this is somewhat deceptive. That last figure comes from a model in which a buyer will

pay 10 times the present value of the common share's cash flow, that in the meantime the firm will increase the common's dividend to match that of the preferred, and all the while the firm's earnings will grow at spectacular 11.9% per year! Eliminating such extreme scenarios leaves one with a value for T_{\max} that is not much better than the value of T calculated from any one explanation. For multiple explanations to help, at least one of the explanations needs to be convincing on its own. The only real advantage that accrues from allowing for a variety of control problems is that as one switches firms one can switch from explanation to explanation. Thus based upon the corporate control models analyzed here, even in combination they are unlikely to explain most of the deep discount of the Russian preferred shares relative to the common observed in 2000.

Another difficulty faced by explanations that emphasize corporate control as the source of the common-to-preferred price ratio is the cross-sectional and intertemporal differences across industries. **Figure 5** displays the common-to-preferred price ratio by industry. Note that the price ratio peaks on different dates for the industrial (either all or small) and the small energy companies. If there existed some change in corporate control law or enforcement that lead to the overall drop in the price ratio during at the end of 2000 then the impact of the event should be apparent across every industry. Yet it is not. The reduction in the price ratio for telecom and energy stocks lag the industrial stocks by over a year. Furthermore, the industrial stocks have a peak in their price ratio during 1998 and small industrial stocks another peak in 1999. If these various shifts were due to the changing corporate control landscape, then whatever was happening was very industry specific and repeatedly moved from favoring the common to the preferred and back again.

4 Preferred Share Voting Rights – The Related Literature

There is some recent academic research that sheds light on the various hypothetical "expropriation" scenarios discussed here. Zingales (1994) documents evidence that shares with voting rights trade for as much as an 82% premium over the prices of shares without the right to vote. He finds that "...on average, nonvoting share have a dividend yield 1.4 times as large as the average dividend yield on the MSE [Milan Stock Exchange]." His explanation for this difference is that controlling shareholders have ways of extracting personal benefits from the firm, and that Italy does not fully protect minority shareholder rights. His data, however, focus on voting versus non-voting shares. The Russian preferred shares, particularly firms like Surgutneftegaz, have a vote in certain circumstances. Thus, it is not clear that the gap can be entirely attributed to the value of the vote. In addition, the dividends to the Russian preferred shares are bounded below by dividends to common shareholders. Unless the common is closely-held by management which is potentially tempted to drain the assets of the firm through corporate perquisites and other shady mechanisms, it would seem unlikely that the Italian experience helps explain the Russian one. Furthermore, as noted earlier, management's mechanism for draining value must include relatively high cash payments to the common relative to the preferred shareholders.

Smith and Amaoko-Adu (1995) use merger data from the Toronto Stock Exchange to investigate the price gap between "super-voting" shares and common shares. They find that super-voting shares get advantageous terms in mergers - 57% on average. Thus, while the super-voting premium in share price is modest - 5 to 10 percent - the price premium commanded by super-voting shares apparently reflects advantageous merger terms times the probability that a merger

will occur. While some Canadian firms have adopted "coat-tail" provisions that require acquiring firms to tender for minority shares at prices paid to the majority this protection is insufficient to guarantee that those with the lion's share of the vote do not take the lion's share of the acquisition premium.

The Russian market has both similarities and differences with the Canadian market. In one sense, the Canadian figures may underestimate the discount on Russian preferred shares since the premium of super voting shares over common shares in Canada is modest by comparison to the premium of Russian common prices over preferred prices. On the other hand, "coat-tail" provisions exist in Russia that limit the degree to which the preferred shareholders can have their wealth expropriated in a takeover. In particular, SG Warburg's *Russian Equity Guide* notes that Article 80(1) of the Law on Joint Stock Companies states that:

If an individual, legal entity and/or group of affiliated companies acquires 30% or more of a company's shares, the buyer(s) must offer to purchase all shareholder's stakes at the weighted-average market price over the previous six months.²⁰

While this provision prevents an acquiring firm from expropriating all minority shareholder value, it does limit the amount payable to minority shareholders to the pre-acquisition price level - in other words, minority shareholders will not necessarily get *any* premium in a merger. Apparently, the law only requires those making a tender offer for 30% or more of a *class* to purchase shares in that *class* on a pro-rata basis. It does not impose a similar requirement across classes. Thus, it would be surprising to find that an acquiring firm did not tender first for the common, and then buy the preferred at the six-month average of the pre-acquisition price levels. Given these

²⁰ Brunswick UBS Warburg, *Russian Equity Guide*, p.13.

restrictions it would appear to be a stretch to fit the Smith and Amaoko-Adu results to the current market prices in Russia.

The hypothesis that the common shareholders earn any takeover premium while the preferred shareholders do not - would further suggest that the discount of Russian preferred shares should be higher if acquiring firms in Russia pay a high premium when they make a tender offer. This is a potentially testable hypothesis. The international mergers database SDC records 1,129 mergers or acquisitions for Russian companies. These include consummated, pending, rumored and failed transactions involving publicly traded firms during the period. This simple count gives some measure of the merger and acquisition activity involving Russian companies since the beginning of privatization - clearly there has been an active market for corporate control in Russia, and thus the probability of an acquisition of any given company is not zero.

5 Conclusion

Russia is a great market in which to study exposure to corporate governance risk. It is now the “Wild West” of corporate control. This paper examines a phenomenon that appears to violate the law of one price; the spread between preferred and common shares in 2000. The analysis suggests that the preferred share discount is hard to explain within a reasonable model of shareholder expropriation, or merger even under very pessimistic assumptions.

The models analyzed here suggest that expropriation would have to have involved the expected seizure of more than 65% of shareholder value by one class of shareholders within about four or five years to justify the then current common-to-preferred price ratio. Alternatively, an acquisition scenario would have to involve a huge premium, coupled with a high level of certainty

that the merger would go. While neither of these explanations can be logically ruled out, they seem improbable. Furthermore, if these were indeed the market's beliefs then such beliefs have not been born out over the past two years.

The dynamics of the common-to-preferred price ratio are also difficult to explain in a corporate control setting. From July of 2000 to February of 2001 the price ratio fell from 6.8 to 2.8. Yet, during this time period takeover activity did not alter dramatically, nor is there any indication that there were dramatic changes in the government's enforcement of shareholder rights. If corporate control issues were the price ratio's primary driver why did the ratio collapse over that particular six month period?

The analysis is consistent with two possible explanations. First, overly-pessimistic views of the potential for management fraud may have been at work. While Russian shares as a group may reflect a discount for such possibilities, the split between preferred and common shares would seem far too large to reflect anything other than extreme, and possibly unwarranted negative sentiment. Nevertheless, it may have existed and then evaporated towards the end of 2000. Second, it may be that rational investors are simply producing price series like those found in multiple equilibria models of asset pricing such as Spiegel (1998). Differentiating between the two explanations will require additional data about corporate fundamentals.

Developing precedent and further regulatory activity may be expected to alleviate apparent shareholder concerns about the potential vulnerability of preferred claims to expropriation and takeovers, and indeed may already have caused the 2000-2001 partial convergence. If nothing else, the analytic framework in this paper offers a means for investors to more formally structure their prior beliefs about adverse events. This structure, in turn, has the

potential to help ascertain what a set of reasonable assumptions about such events may imply about the relative value of Russian preferred and common shares.

The price difference between Russian common and preferred shares is of much more than academic interest. For Russian companies, a major concern is the cost of capital. The analysis indicates that the yields on the preferred shares are higher than is warranted by discount and growth rates implied by the common. This suggests it is profitable for Russian firms to buy back their preferred shares at prevailing market prices and finance such activity with new common equity issues; a swap some firms have recently engaged in. Of course, if the extent of such swaps increases this will raise the price of the preferred shares making future swaps potentially unprofitable.

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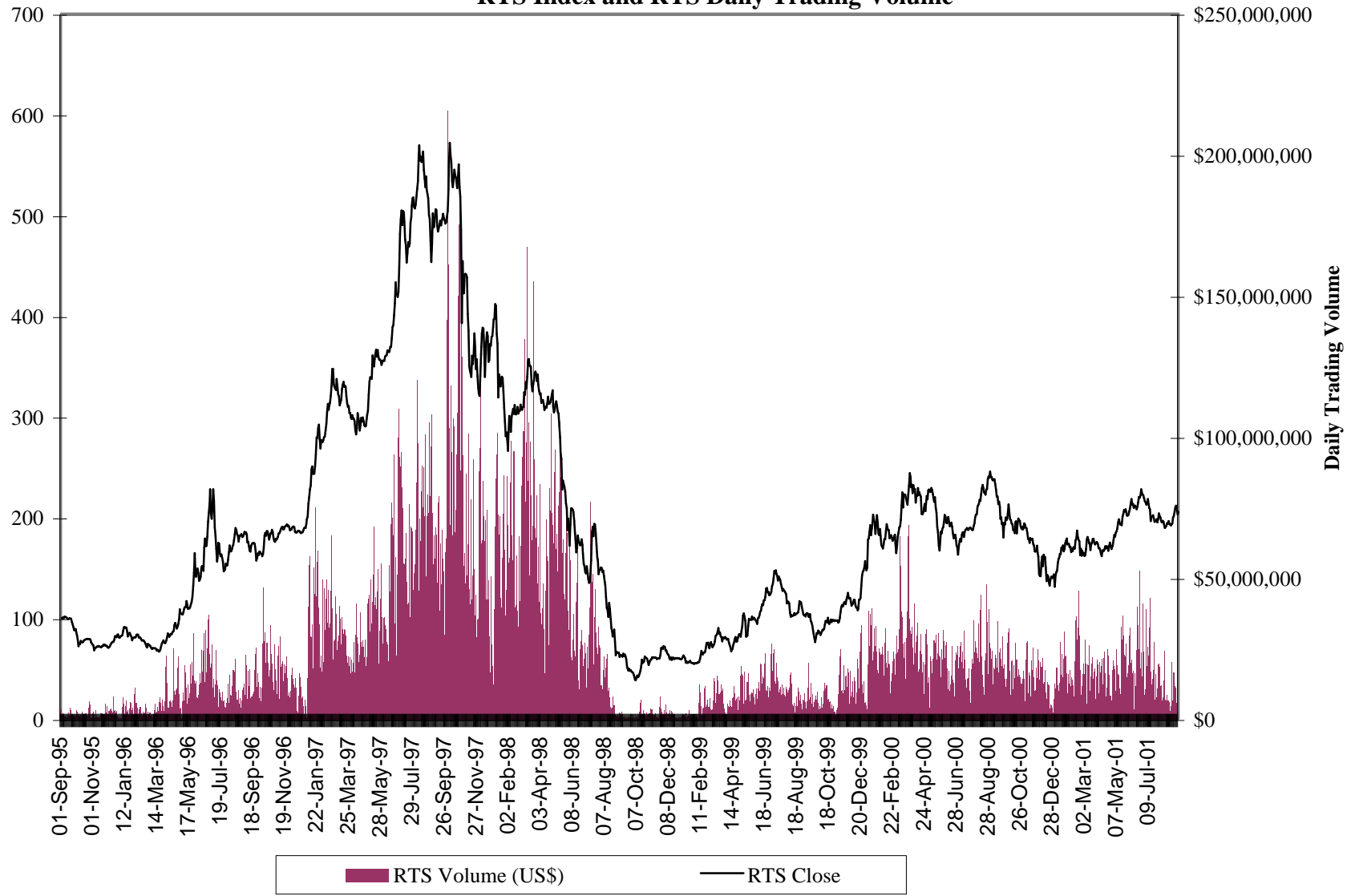
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Figure 1
RTS Index and RTS Daily Trading Volume



Repeat Sales Index - All Stocks

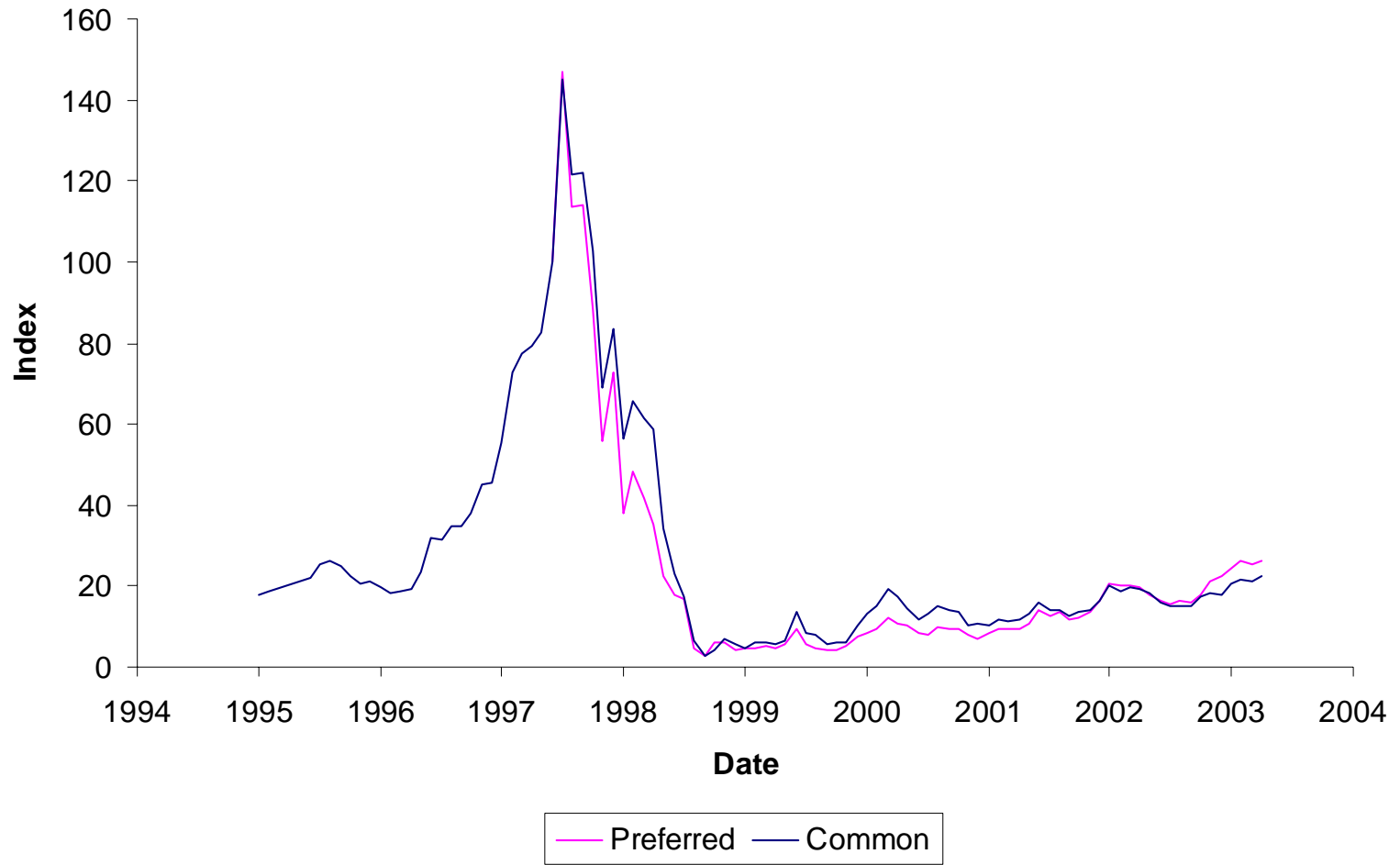


Figure 2

Equally Weighted Index: 8 Firms

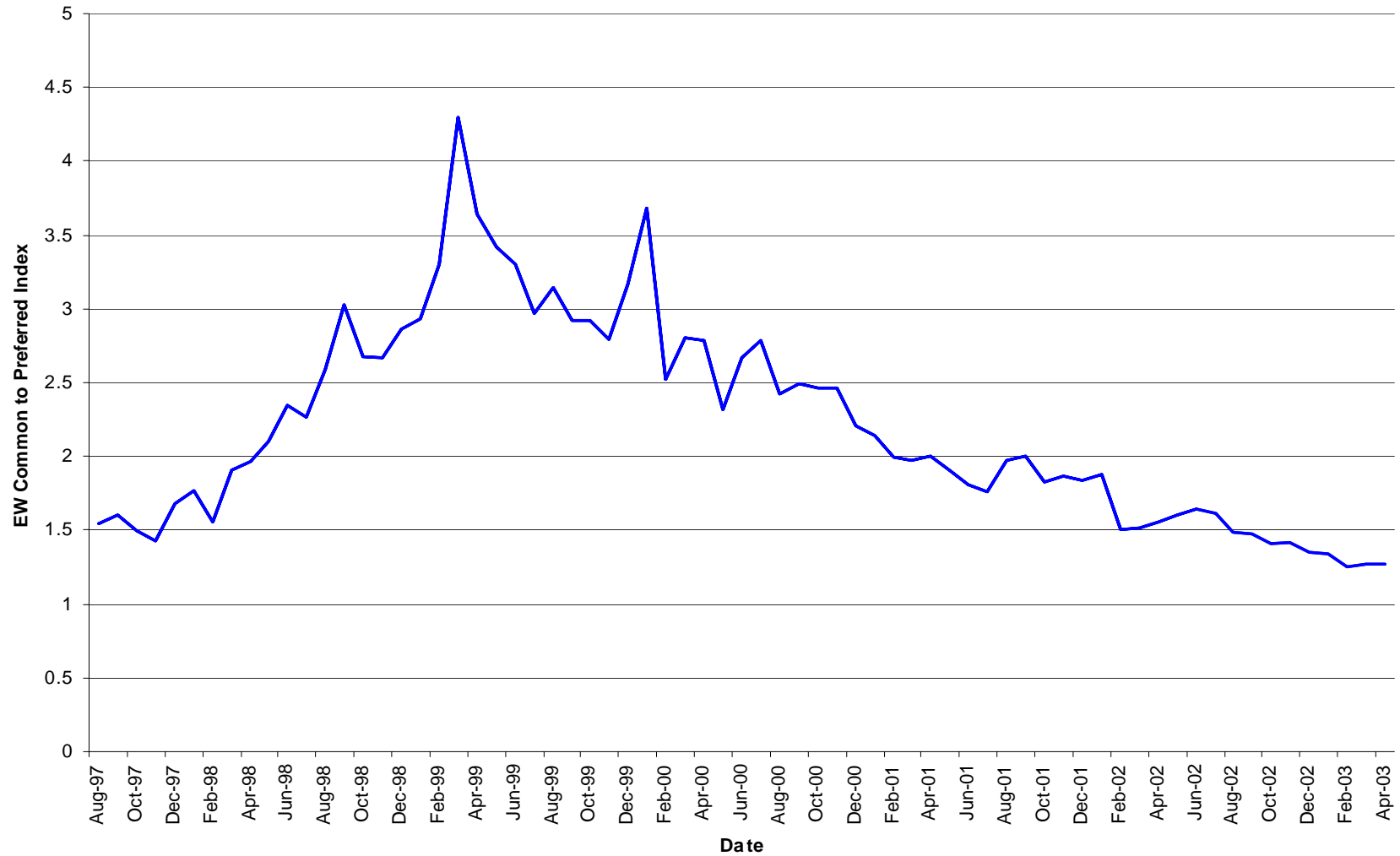


Figure 3: The index contains EESR, LKOH, NKEL, RTKM, SNGS, KUBN, SVIC, and TATN.

The Average Ratio of Common to Preferred Price for All Stocks

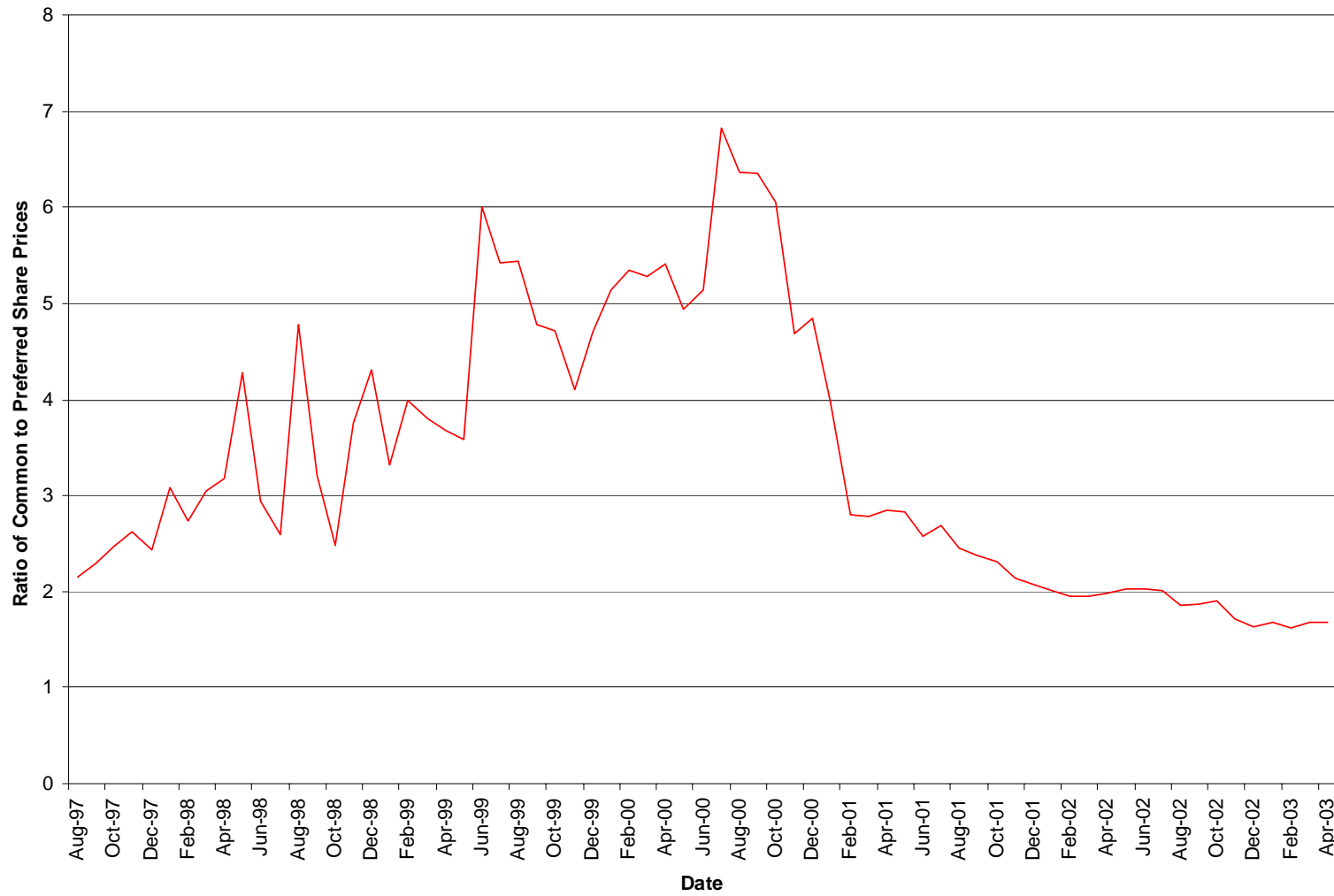


Figure 4

Ratio of Common to Preferred Price for All Industries

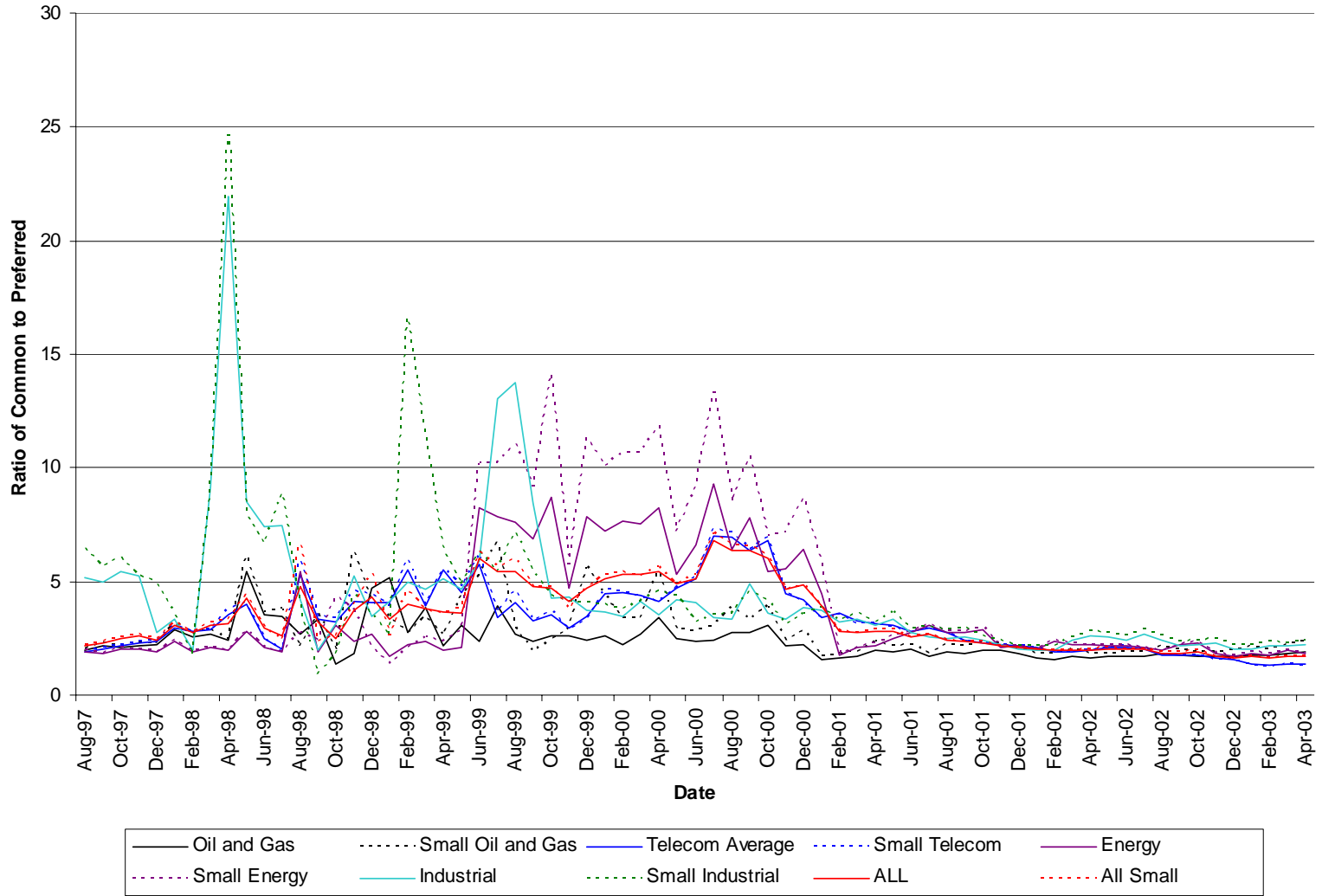


Figure 5

Table 1
Annual Dividend Payments per 1,000 Shares to Common and Preferred Shares \$US

		1994	1995	1996	1997	1998	1999	2000	2001	2002
EESR	Unified Energy System	0.9385	0.6708	1.0179	0.8718	0.8138	0.2442	0.4667	0.6930	0.8261
EESRP	Unified Energy System	1.0986	0.7852	1.0179	0.8718	1.4925	0.5961	1.3074	2.5572	3.7649
LKOH	LUKoil Holdings		20.6569	100.8065	52.0472	35.9948	9.8039	106.1383	274.6310	476.7202
LKOHP	LUKoil Holdings		103.2844	100.8065	173.4906	148.8874	104.7059	617.3713	2030.896	n.a.
NKEL	Norilsk Nickel		175.2962	0	0	0	0	63.8114	60.1427	0
NKELP	Norilsk Nickel		603.8482	80.5560	0.3204	1.6269	0	63.8114	60.1427	0
RTKM	Rostelecom		0	0	0	13.3582	0	5.8416	5.4894	6.8485
RTKMP	Rostelecom		9.9621	88.4011	82.3692	93.1925	0	28.7393	14.5572	29.3590
SNGS	Surgutneftgas		0.7504	1.4082	1.2214	1.1416	0.3557	0.7125	1.4157	1.0574
SNGSP	Surgutneftgas		1.1476	5.2303	4.5367	4.2401	0.3557	3.0638	6.2155	3.2041
KUBN	Kubanelectrosvyaz			34.9239	92.0139	152.8027	23.5294	68.6665	100.9165	6.0180
KUBNP	Kubanelectrosvyaz			522.8426	919.9653	1145.9389	117.6471	294.4872	428.7234	6.0180
LSNG	Lenenergo		0.003289	0.003	0.003	0	0	0	0	0.3324
LSNGP	Lenenergo		5.32	0.03	0.02	0	0	0	0	0.7653
SVIC	Svyazinform of Chelyabinsk	20.1975	94.0790	92.8461	251.1612	320.5546	38.7405	41.6373	47.1847	71.1225
SVICP	Svyazinform of Chelyabinsk		827.9313	1432.5008	2273.7709	2176.3458	184.3806	209.4566	141.8970	192.5807
TATN	Tatneft		0	10.5111	10.3923	9.7324	1.6404	3.5511	10.3164	3.1771
TATNP	Tatneft					16.2206	4.1009	5.3267	20.6327	31.7712

Zero means that explicit decision to omit the dividend was made. Empty cell means no data is reported for the year. Common is on the first line, preferred (indicated by "P" at the end of the ticker symbol) is on the second line. The numbers shown are exact (not rounded) dividend amounts. LKOHP: Effective 9/14/01 all LUKoil preferred shares converted on 1:1 basis to preferred convertible shares and effective 11/22/01 they were converted to common shares. KUBN and KUBNP were split 109 to 1 on 01/21/02 and the 2002 dividend is split adjusted for easy comparison with the previous years. Rubble dividend amounts are converted to US Dollar using the exchange rate on the dividend announcement date.

Table 2
Preferred Shares in Russia - Summary Statistics

Total number of stocks in RTS Archive (stocks that once were and/or still are listed)	909 stocks
- Number of Common	651 stocks
- Number of Preferred	258 stocks
Total number of stocks in Archive with at least 1 reported trade	472 stocks
The number of <i>companies</i> with both common and preferred shares in RTS Archives	251 companies
Currently listed equity securities (24 Sep 2001)	389 stocks
Percent of RTS US\$ historical trading volume from trades in common and preferred of the dual class firms	73%
Percent of RTS US\$ historical trading volume from trades in <i>preferred</i> of the dual class firms	4.5%
Volume of trades in preferred as fraction of trading volume in dual class firms	6.2%
Percentage of market capitalization of RTS Index accounted for by preferred stocks	5.55%
Percentage of market capitalization of RTS Index accounted for by dual class <i>firms</i> in the index	65.21%

Table 3
Liquidity Measures: Common and Preferred Shares in Dollars and Number of Trades in 2000

Panel A: Russian Firms				
Company	In Absolute Terms		Trades in Common	Trades in Preferred
	Common \$ Volume	Preferred \$ Volume		
Unified Energy System	2,253,688,162	39,158,120	36,054	1,190
Lukoil	940,120,973	84,621,188	8,410	956
Norilsk Nickel	248,069,281	22,186,934	3,388	479
Rostelecom	261,099,094	25,580,545	5,383	966
Surgutneftegaz	501,407,145	198,272,199	9,084	3,766
Kubanelectrosvyaz	6,310,558	1,214,016	301	92
Svyazinform of Chelyabinsk	2,347,873	929,872	65	56
Tatneft	345,579,477	5,841,688	5,916	313
	Relative to Market Value		Average Trade in \$	
Unified Energy System	0.465	0.408	\$62,508	\$32,906
Lukoil	0.119	0.096	\$111,786	\$88,516
Norilsk Nickel	0.205	0.188	\$73,220	\$46,319
Rostelecom	0.352	0.263	\$48,504	\$26,481
Surgutneftegaz	0.056	0.021	\$55,197	\$52,648
Kubanelectrosvyaz	0.060	0.099	\$20,965	\$13,196
Svyazinform of Chelyabinsk	0.026	0.073	\$36,121	\$16,605
Tatneft	0.345	0.189	\$58,414	\$18,664
Panel B: Matching U.S. Firms				
	Relative to Market Value			
Unified Energy System	1.344	2.131		
Lukoil	8.825	1.249		
Norilsk Nickel	1.902	0.827		
Rostelecom	3.001	1.361		
Surgutneftegaz	4.551	2.062		
Kubanelectrosvyaz	1.025	0.906		
Svyazinform of Chelyabinsk	4.270	1.184		
Tatneft	1.370	19.36		

Notes: Matching U.S. firms are the ten firms with the closest market capitalizations to the market capitalization of the Russian security. For example, the matching sample for Lukoil contains two sets of ten U.S. stocks. The first set has the ten closest in market value to the market value of Lukoil common, the second set the ten closest in market value to the Lukoil preferred. Each set of ten contains five with market capitalizations above and five below the matching security.

Table 4.
Large Transactions 1996 – 2002

Date	Transaction	Company	Share Classes	Ticker	Transaction	Price Per Share	
						Before	After
1996							
2/1/96	15.03% Stake	Chernogorneft Oil & Gas	C	CHGZ	n.a.	6.1	6
4/11/96	1,000,000 shares for \$5.29 million	Norilsk Nickel	C, P	NKEL	5.29	4.45	4.58
8/9/96	30% for \$6 million	ZIL (Zil Imeni Lihacheva)	C, P	ZILL	7.52	3.18	10
10/24/96	5.5% (500 mil ordinary shares) for \$90 mil.	Surgutneftegaz	C, P	SNGS	0.18	0.462	0.396
12/9/96	8% Stake	Lensvyaz	C, P	LNTC	n.a.	n.a.	21
1997							
1/27/97	3.18% (614,000 ordinary shares) for \$38.67 per share	Vimpel Communications	C, P	VIMP	38.67	n.a.	32
7/18/97	2% for \$3.6 million	Lensvyaz	C, P	LNTC	90.5	67	62
7/29/97	27% Stake	Krasnoyarsk Aluminum Smelter	C	KRAZ	n.a.	n.a.	n.a.
8/6/97	57% Stake	Segezhabumprom	C	SGBK	n.a.	n.a.	n.a.
8/20/97	10.4% for \$17.2 mil	St.Petersburg MMT (Telecom)	C, P	SMMT	3.33	3.5	3.6
10/31/97	10% Stake	Siberian Far East Oil Corp (SIDANCO)	C	SDNK	n.a.	n.a.	n.a.
11/10/97	Up to 9.68% (1.034 mil ordinary shares)	Vimpel Communications	C, P	VIMP	n.a.	n.a.	32
1998							
4/21/98	8% bought for \$12.21 million	Toribank	n.a.	n.a.	n.a.	n.a.	n.a.
6/12/98	10% stake for \$30 mil	Krasnoyarsk Aluminum Smelter	C	KRAZ	3.51	n.a.	n.a.
10/31/98	8.3% Stake	Lenenergo	C, P	LSNG	n.a.	0.2067	0.2
12/1/98	31.6% (8,902,201 newly issued ordinary shares), \$18.19 per share; total \$162 mil	Vimpel Communications	C, P	VIMP	18.19	n.a.	32
1999							
1/14/99	19.7% Stake	Novosibirsk Energo	C, P	NVNG	n.a.	1.158	0.8
5/7/99	25% (1,496,800 ordinary shares)	Novolipetsk Steel Company	C, P	NFMF	n.a.	185	n.a.
6/10/99	31.9% (713,603,000 ordinary shares) in	YukosNeftegas	C	YUKO	n.a.	0.1	0.3
7/26/99	5.2% for \$0.89 mil.	Far East Shipping Co. (FESCO)	C	FESH	0.0104	n.a.	0.0125
9/4/99	5% (417,790 ordinary shares); \$11.2 per share	Krasny Oktyabr	C, P	KROT	11.2	5.2	2.75
11/16/99	7.41% Stake	Sibneft (Sibirskaya Neftyanaya)	C	SIBN	n.a.	0.339	0.267
11/25/99	15.24% (340,918,800 ordinary shares)	YukosNeftegas	C	YUKO	n.a.	0.175	0.73
2000							
3/7/00	8.02% (918,748 ordinary shares)	Smolensksvyazinform	C, P	SMSI	n.a.	n.a.	0.6
3/27/00	12% (10,540,044 ordinary shares)	Orenburgneft	C, P	ORNB	n.a.	0.45	1.7
3/31/00	12.1% (16,964,042 ordinary shares)	NK Slavneft	C	SLAV	n.a.	n.a.	0.26
6/9/00	14.29% (677,531,718 ordinary shares)	Sibirskaya Neftyanaya (Sibneft)	C	SIBN	n.a.	0.2425	0.25
8/1/00	3.2% (901,830 ordinary shares) \$30 mil.	Vimpel Communications	C, P	VIMP	33.27	34	35.25
9/15/00	6.01% Stake	Krasny Kotelshchik	C, P	KRKO	n.a.	0.105	0.1406
9/25/00	10% Stake	Krasnoyarsk Aluminum Smelter	C	KRAZ	n.a.	n.a.	n.a.
9/26/00	36% (17,326,483 ordinary shares) for \$20.5 mil.	Seversky Tube Works	C	SVTZ	1.18	0.8	1.55
12/18/00	54% (25,989,725 ordinary shares)	Seversky Tube Works	C	SVTZ	n.a.	1.9	1.95
2001							
1/10/01	10.63% Stake	Krasnoye Sormovo	C, P	KSMV	n.a.	n.a.	n.a.
3/12/01	40% Stake	Ufamolagroprom	C	UFAA	n.a.	n.a.	n.a.
3/27/01	52% (25,027,142 ordinary shares)	Seversky Tube Works	C	SVTZ	n.a.	1	n.a.
4/2/02	49.8% (12.2 mil ordinary shares), \$10.25 per ordinary share;	Golden Telecom	n.a.	n.a.	10.25	n.a.	n.a.

Table 4.
Large Transactions 1996 – 2002

Date	Transaction	Company	Share Classes	Ticker	Transaction	Price Per Share	
						Before	After
	\$125 mil total						
5/8/01	29.3% (325,410,575 ordinary shares) for \$25 mil	Aeroflot	C	AFLT	0.077	0.358	0.363
8/2/01	30% Stake	Barnaul Tire Plant	C	BASS	n.a.	n.a.	n.a.
8/2/01	44% (102,262,600 ordinary shares) in SIDANCO for \$650 mil	Siberian Far East Oil Corp (SIDANCO)	C	SDNK	6.36	n.a.	5.05
10/16/01	6.22% (841,217 ordinary shares)	Novosibirsk Energo	C, P	NVNG	n.a.	1.65	1.793
11/28/01	30% (1,142,284,674 ordinary shares)	Tomskenergo	C, P	TOME	n.a.	0.01	0.009
		2002					
1/16/02	51.06% Stake	Babayevskoe Confectionery Plant	C	BABT	n.a.	n.a.	n.a.
2/8/02	16.94% (48,967,441 ordinary shares)	Orenburg Electrosvyaz	C, P	ESOB	n.a.	0.075	0.08
2/26/02	10% (350,686,028 ordinary shares)	Samaraenergo	C, P	SAGO	n.a.	0.034	0.034
4/3/02	29% (24,788,775 ordinary shares)	Krasnoyarsk Aluminum Smelter	C	KRAZ	n.a.	n.a.	n.a.
4/15/02	60% Stake	Far Eastern Shipping Co (FESCO)	C	FESH	n.a.	0.0155	0.03
4/16/02	20% Stake	Krasny Oktyabr	C, P	KROT	n.a.	8.5	8
4/16/02	15% for \$380 million	Siberian Far East Oil Corp (SIDANCO)	C	SDNK	10.9	10	9.9
4/16/02	56% Stake	Taganrog Metal Plant	C	TAMZ	n.a.	0.16	0.1305
6/5/02	11.33% Stake	Nizhny Tagil Metal	C	NTMK	n.a.	0.055	0.045
7/2/02	19.9% Stake	Tambovenergo	C, P	TAEN	n.a.	0.011	0.0079
7/29/02	17.23% Stake	Khabarovsk Elektrosvyaz	C, P	ESHB	n.a.	2.05	n.a.
8/7/02	12.29% Stake	Volga Telecom	C, P	NNSI	n.a.	0.9	0.9
10/9/02	10.83% for \$206.951 million	NK Slavneft	C	SLAV	0.4	0.54	0.6

Notes: The table reports large block transactions in Russian publicly traded companies from 1996 through 2002, from the SDC International Database. Price per share paid in the transaction is shown when it is reported by SDC. Price Before is the share price from a trade on a date before the reported transaction. Price After is market price on a date after the transaction. For less liquid stocks, several months may separate the Before, Transaction, and After date. The column Share Classes shows the types of share classes outstanding for the company at the date of the transaction, C stands for Common and P for Preferred.

Table 5.

Values of T and g Implied by Prices of Common and Preferred Shares for Various Real Interest Rates and Expropriation Levels

		Company							
r		EESR	LKOH	NKEL	RTKM	SNGS	KUBN	SVIC	TATN
Panel A: 2000 Prices									
Expropriation Level: 75% ($\alpha = 0.75$)									
5%	g	4%	2%	4%	4%	4%	3%	4%	4%
	T	22	14	388	6	19	4	0	13
10%	g	9%	7%	9%	9%	9%	8%	9%	9%
	T	23	15	407	6	20	5	0	13
15%	g	14%	12%	14%	14%	14%	13%	14%	14%
	T	24	16	425	6	21	5	0	14
Expropriation Level: 60% ($\alpha = 0.60$)									
5%	g	4%	2%	4%	4%	4%	3%	4%	4%
	T	0	7*	353	0	0	0	0	0
10%	g	9%	7%	9%	9%	9%	8%	9%	9%
	T	0	7	370	0	0	0	0	0
15%	g	14%	12%	14%	14%	14%	13%	14%	14%
	T	0	8	387	0	0	0	0	0

Table 5.

Values of T and g Implied by Prices of Common and Preferred Shares for Various Real Interest Rates and Expropriation Levels

r	Company								
	EESR	LKOH	NKEL	RTKM	SNGS	KUBN	SVIC	TATN	
Panel B: 2002 Prices									
Expropriation Level: 75% ($\alpha = 0.75$)									
5%	g	2.5%	-4%	4.5%	3%	4%	-8%	4%	1.8%
	T	21	6	609	14	56	4	28	8
10%	g	7.5%	0%	9.5%	8%	9%	-3%	9%	6.8%
	T	22	6	638	15	58	4	29	8
15%	g	12.5%	6%	14.5%	13%	14%	2%	14%	11.8%
	T	23	7	667	15	61	4	31	8
Expropriation Level: 60% ($\alpha = 0.60$)									
5%	g	2.5%	-4%	4.5%	3%	4%	-8%	4%	1.8
	T	12	4	560	2	24	2	10	0
10%	g	7.5	0%	9.5%	8%	9%	-3%	9%	6.8%
	T	12	4	586	2	26	2	10	0
15%	g	12.5%	6%	14.5%	13%	14%	2%	14%	11.8%
	T	13	4	613	2	27	3	11	1

Notes: Expropriation Level: 100% means common takes everything. The variable T represents within how many years said expropriation would have to take place to explain the current common to preferred price ratio. A value of 0 implies that even immediate expropriation may be insufficient. g = growth rate, r = real interest rate, α = expropriation level. Prices are taken as of the date of the annual dividend announcement. For LKOH and NKEL the Panel B prices are from 2001, as their preferred were swapped one-for-one for their common stock that year.

Table 6.
Total Mergers by Year 1995-2002

Year	Mergers
1995	0
1996	1
1997	1
1998	2
1999	4
2000	0
2001	1
2002	5
Total	14

Notes: Data comes from the SDC International Mergers and Acquisitions database for the eight year period from January 1, 1995 through December 31, 2002. To be included in the search, the target had to be a public company. Over the period of eight years there are 14 takeovers, or 1.75 mergers per year.

Table 7.
Sample Firm Size Measures

Ticker	Revenues (\$ millions)				Total Assets (RUB Millions)			
	1999	2000	2001	2002	1999	2000	2001	2002
EESR		895.13	1,323.75	1,676.96		173,931.93	263,038.52	341,150.56
LKOH		8,598.47	6,627.80	7,368.48		93,955.10	119,723.14	166,798.62
NKEL		29.22	33.46	3.24	140,163.30	142,031.00		
RTKM		599.80	659.27	810.21		39,754.80	36,974.23	40,949.13
SNGS		5,570.14	5,044.41	5,925.27	161,551.61		351,031.49	529,261.26
KUBN		77.29	89.04	335.83		2,803.71	4,080.22	16,467.46
SVIC	39.94	48.98	62.45		2,180.72	3,324.89	4,070.69	
TATN		3,764.26	3,457.30	3,465.78		80,880.57	101,129.20	110,533.19

Table 8.

Values of T and g Implied by Prices of Common and Preferred Shares for Various Real Interest Rates and Merger Premium Levels: Payouts Estimated Using Historical Ratios

r	Company								
	EESR	LKOH	NKEL	RTKM	SNGS	KUBN	SVIC	TATN	
Panel A: 2000 Prices and Historical Payouts									
Merger Premium: $m = 2$									
	P_{CT}/E_T	26.1	7.8	602.2	2.7	2.5	2.5	5.1	1.2
5%	g	2.40%	-0.80%	4.30%	0.90%	2.50%	-2.50%	1.90%	1.10%
	T	0	0	397	0	0	0	0	0
	g	7.40%	4.20%	9.30%	5.90%	7.50%	2.50%	6.90%	6.10%
10%	T	0	0	416	0	0	0	0	0
	g	12.40%	9.20%	14.30%	10.90%	12.50%	7.50%	11.90%	11.10%
15%	T	0	0	435	0	0	0	0	0
	Merger Premium: $m = 10$								
	P_{CT}/E_T	95.7	28.5	2208.1	10.0	9.1	9.2	18.8	4.4
5%	g	2.40%	-0.80%	4.30%	0.90%	2.50%	-2.50%	1.90%	1.10%
	T	22	7	632	0	4	0	0	23
	g	7.40%	4.20%	9.30%	5.90%	7.50%	2.50%	6.90%	6.10%
10%	T	23	8	650	0	4	0	0	24
	g	12.40%	9.20%	14.30%	10.90%	12.50%	7.50%	11.90%	11.10%
15%	T	24	8	694	0	4	0	0	25
	Panel B: 2002 Prices and Historical Payouts								
Merger Premium: $m = 2$									
	P_{CT}/E_T	5.31	2.24	502	4.28	19.65	19	13	0.52
5%	g	0.42%	-11.13%	4.50%	0.43%	3.49%	-18.93%	2.24%	-2.91%
	T	0	0	630	0	0	1	0	0
	g	0.05%	-0.06%	0.10%	0.05%	0.08%	-0.14%	0.07%	0.02%
10%	T	0	0	660	0	0	1	0	0
	g	0.01%	-0.01%	0.15%	0.10%	0.13%	-0.09%	0.12%	0.07%
15%	T	0	0	690	0	0	1	0	0
	Merger Premium: $m = 10$								
	P_{CT}/E_T	19.46	8.21	1841	15.71	72.03	69.49	47.53	1.9
5%	g	0.00425	-0.111331	0.045014	0.00432	0.034894	-0.189342	0.022422	-0.02911
	T	18	3	968	7	62	7	33	0
	g	0.054247	-0.06133	0.095014	0.054321	0.084894	-0.139342	0.072422	0.020886
10%	T	19	3	1015	8	65	8	34	0
	g	0.104247	-0.01133	0.145014	0.104321	0.134894	-0.08934	0.122422	0.070886
15%	T	20	3	1061	8	67	8	36	0

Notes: The model takes the merger premium and the real interest rate r as given and then solves for g and T . Merger Premium: 1 equals a 100% premium, and 10 a 1000% premium. The value of T states that the current common to preferred price ratio can only be explained if a takeover occurs within T years, the firm continues to grow at a rate g between now and then, and the discount rate equals r . A value of $T=0$ implies an immediate takeover at the multiple of m will not equilibrate the value of the preferred and common shares. P_{CT}/E_T equals the model's implied price-earnings ratio for the common shares at the takeover date T . This value depends only upon the implied growth and interest rates, and not on T , since the takeover price is assumed to grow proportionately with earnings.

Table 9.

Values of T and g Implied by Prices of Common and Preferred Shares for Various Real Interest Rates and Merger Premium Levels

Equal Common Preferred Payouts: See Notes Below

r	Company								
	EESR	LKOH	NKEL	RTKM	SNGS	KUBN	SVIC	TATN	
Panel A: 2000 Prices									
Merger Premium: $m = 2$									
	P_{CT}/E_T	73.6	45.3	602.2	13.5	10.6	10.8	25.8	1.8
5%	g	2.40%	-0.80%	4.30%	0.90%	2.50%	-2.50%	1.90%	1.10%
	T	14	33	397	0	16	1	0	0
10%	g	7.40%	4.20%	9.30%	5.90%	7.50%	2.50%	6.90%	6.10%
	T	15	34	416	0	17	1	0	0
15%	g	12.40%	9.20%	14.30%	10.90%	12.50%	7.50%	11.90%	11.10%
	T	15	36	435	0	18	1	0	0
Merger Premium: $m = 10$									
	P_{CT}/E_T	270.0	166.0	2208.1	49.4	38.9	39.6	94.0	6.6
5%	g	2.40%	-0.80%	4.30%	0.90%	2.50%	-2.50%	1.90%	1.10%
	T	79	61	632	40	82	23	33	37
10%	g	7.40%	4.20%	9.30%	5.90%	7.50%	2.50%	6.90%	6.10%
	T	82	64	650	42	86	24	35	39
15%	g	12.40%	9.20%	14.30%	10.90%	12.50%	7.50%	11.90%	11.10%
	T	86	67	694	44	90	25	36	40
Panel B: 2002 Prices									
Merger Premium: $m = 2$									
	P_{CT}/E_T	24.18	16.57	502	18.37	59.53	18.95	35	5.18
5%	g	0.00%	-0.11%	0.05%	0.00%	0.03%	-0.19%	0.02%	-0.03%
	T	51	30	630	17	74	1	29	14
10%	g	0.05%	-0.06%	0.10%	0.05%	0.08%	-0.14%	0.07%	0.02%
	T	54	32	660	18	78	1	31	14
15%	g	0.10%	-0.01%	0.15%	0.10%	0.01%	-0.09%	0.12%	0.07%
	T	56	33	690	19	82	1	32	15
Merger Premium: $m = 10$									
	P_{CT}/E_T	88.67	60.74	1841	67.36	218.28	69.49	128.71	19
5%	g	0.00%	-0.11%	0.05%	0.00%	0.03%	-0.19%	0.02%	-0.03%
	T	87	40	968	54	186	7	90	34
10%	g	0.05%	-0.06%	0.10%	0.05%	0.08%	-0.14%	0.07%	0.02%
	T	92	42	1015	56	194	8	94	36
15%	g	0.10%	-0.01%	0.15%	0.10%	0.13%	-0.09%	0.12%	0.07%
	T	96	44	1061	59	203	8	98	37

Notes: Historically the common has received a *lower* dividend per share than the preferred. The calculations in this table assume that going forward the common will receive an amount equal to the preferred, which is the maximum allowed by law. The model takes the merger premium and the real interest rate r as given and then solves for g and T . Merger Premium: 1 equals a 100% premium, and 10 a 1000% premium. The value of T states that the current common to preferred price ratio can only be explained if a takeover occurs within T years, the firm continues to grow at a rate g between now and then, and the discount rate equals r . A value of $T=0$ implies an immediate takeover at the multiple of m will not equilibrate the value of the preferred and common shares. P_{CT}/E_T equals the model's implied price-earnings ratio for the common shares at the takeover date T . This value depends only upon the implied growth and interest rates, and not on T , since the takeover price is assumed to grow proportionately with earnings.