Glamour and value in the land of Chingis Khan

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Patterns in the cross-section of returns from stocks bought for vouchers in Mongolia's privatization program mirror those from developed countries. Stocks in companies with high book-to-market ratios subsequently earned returns far bigger than those in companies with low ratios, a result very robust to changes in specification and sample. Features of privatization and of sample generation lead to quick dismissal of certain explanations appearing in previous studies, e.g., data snooping and agency explanations. Risk can explain part of the high returns to value, but much remains unexplained by risk, characteristics, or other standards explanations. The results, which are consistent with many studies of developed stock markets, suggest that prices did not reflect fully publicly available information. *Journal of Comparative Economics* **31** (1) (2003) 34–57. The World Bank, 1818 H Street, NW, Room H4-407, Washington, DC 20433, USA; Deloitte-Touche-Tohmatsu, Washington, DC 20001, USA; University of Maryland, College Park, MD 20742, USA.

1. Introduction

To accommodate the massive transfers of ownership at the heart of large-scale privatization programs, stock exchanges were created in most of the transition countries of the former communist world. Twenty-one out of 27 countries created such exchanges

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(Claessens et al., 2001).[1] These newly created exchanges were essential for the transfer of shares of newly corporatized enterprises from the state to investors. They also represented the first forays into building the institutions for market exchange of shares. Examining the performance of these new laboratories of capitalism provides both an indication of the efficacy of the new institutions and novel observations for expanding our understanding of investor behavior generally.

This paper examines the cross-section of initial returns in one of the less advanced transition countries, Mongolia, and finds marked similarities with studies of capital markets in developed countries. In particular, a large body of research on the cross-section of returns in Western countries shows that value stocks, for example stocks with high ratios of book-to-market value, outperform glamour stocks, stocks with low ratios, in the sense that value stocks earn higher returns (Fama and French, 1992; Lakonishok et al., 1994). Most studies employ data from the United States, but there is also international evidence supporting the returns to value (Chan et al., 1991; Capaul et al., 1993; Fama and French, 1998; Rouwenhorst, 1999). The underlying reasons for the observed patterns are still debatable; explanations include survivorship bias (Kothari et al., 1995), a risk–return trade-off (Fama and French, 1993, 1995, 1996), and pricing mistakes (Lakonishok et al., 1994). The ultimate resolution of this debate has implications for our understanding of market efficiency.

In this paper, we examine data from the Mongolian privatization program from 1992 to 1995 and find strong evidence that returns to value can be found as far away as Mongolia, the land of Chingis Khan. A confirmation of the returns to value stocks, particularly the strong and extremely robust positive relationship between the book-to-market ratio and shareholder returns, from such a novel dataset, attests to the ubiquity of this important empirical regularity.

Mongolia's experiment with mass privatization adds an interesting new perspective to the literature on the returns to value for another reason. Features of the privatization program allow us to eliminate previous explanations of the causes of higher returns to value, narrowing the range of possible causes. Data snooping cannot be driving the results; Mongolia is as far out of sample as one can get and our empirical approach was dictated largely by earlier studies. Survivorship bias, *per se*, cannot explain the results. Enterprise characteristics, such as sector and location, explain some but not all of the returns to value. Likewise, we find that, while value stocks were riskier in some ways but less risky in others, the superior returns to value are not attributable to risk. Lastly, while the agency explanation for market inefficiency presented by Lakonishok et al. (1992, 1994) is not pertinent to Mongolia, we argue that the Mongolian situation is described well by the simple, but unsettling, explanation that people buy without full regard to price (La Porta et al., 1997).

Section 2 presents a brief background of the Mongolian privatization program, highlighting features that play key roles in our analysis. Section 3 provides details related to the data and characterizes our empirical approach. Section 4 discusses our basic results on the relation between average returns and the book-to-market ratio, the earnings-to-price

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[1] The authors report 20 of 26 countries; however, they do not include Mongolia.

ratio, leverage and size, as well as the robustness of these results.[2] Section 5 uses the Mongolian data to analyze the underlying causes of the very persistent returns to value stocks. Section 6 concludes with a summary of our main findings.

2. Mongolia's large-scale privatization program

After 70 years of Soviet domination, Mongolia's reformers took advantage of *pere-stroika's* freedoms and renounced Communism more than a year before the dissolution of the USSR. Democratic and economic reforms began in 1990, with privatization as the centerpiece of the latter. Adopted in May 1991, the Privatization Law included separate programs for agriculture, small enterprises, and large enterprises, the last of which is the program of central interest in this paper (Hahm, 1993, addendum; Korsun and Murrell, 1995). The scope of the program was enormous as the value of assets slated for voucher privatization exceeded one year's GDP.[3]

In an effort to ensure an equitable distribution of state assets and in response to the low stock of savings held by the populace, Mongolia chose a voucher-privatization scheme. The reformers also believed that such a broad-based program involving every citizen would serve to teach the population about the workings of a free-market economy. As did many other transition countries, Mongolia retained partial state ownership in many enterprises.[4] Every citizen born before May 31, 1991 was entitled to a book of vouchers to be used during privatization. The vouchers used for buying large enterprises were assigned a nominal value of 7000 *togrogs,* but unlike the vouchers in Russia, they were non-tradable. In addition, the *togrog* used on the face of the vouchers had no relation to the currency used in everyday transactions, also the *togrog*. Due to the non-tradability of vouchers, their value in terms of actual coterminous currency is unknown. We simplify our exposition by using the term *voucher–togrog*, or *VT*, to refer to the nominal currency on the face of the vouchers and use *togrog* to refer only to the national currency. [5]

To implement privatization, the government established a stock exchange, the MSE, and a network of 29 brokerage houses throughout the country. Citizens placed orders through brokers, indicating the enterprises they wished to buy and the price they were willing to pay. Buyers had the option of indicating a purchase at the market price. Investors who

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[2] Anderson et al. (1999b) provide details for many of the tests not presented here.

[3] The program set out to privatize some 44 percent of the nation's stock of fixed assets (Ochbadrakh, 1995).

[4] Among enterprises in the large-scale privatization program, the state kept majority ownership in 40 percent of the enterprises and minority ownership in 14 percent. The remaining 46 percent of enterprises were fully privatized. See Korsun and Murrell (1995, 2000) and Anderson et al. (1997) for Mongolia, and Pistor and Turkewitz (1996) for other countries.

[5] The book of vouchers included two sets, pink and blue, and were given free of charge to low income families, while others were required to pay the nominal fee of 200 *togrogs* for the entire book of vouchers (Hahm, 1993). The tradable pink vouchers were used primarily for the small privatization program and are therefore not relevant for this paper. The non-tradable blue vouchers were used for the privatization of large enterprises and for the privatization of livestock by those who worked on collective farms. Some may have also had the expectation that blue vouchers could eventually have value during housing privatization, although such expectations turned out to be incorrect since apartments were ultimately given to the renters of record.

wanted greater diversification or who did not know which enterprise to buy had the option of purchasing shares in mutual funds established by the brokers. Few Mongolians took this option; only 2 percent of the shares were sold to mutual funds (Korsun and Murrell, 1995). Prior to each enterprise's first auction of shares, basic financial information about the enterprise was published in the nation's largest newspaper, *Ardyn Erh*, to inform the public of the financial condition of the enterprise.

Officials at the MSE attempted to simulate a market. Blocks of shares were auctioned off for vouchers over periods of time ranging from several days to several months. The MSE served as the clearing house for transactions and as the repository of records. The exchange was, and still is, a paperless system; all records of share ownership continue to be maintained by the MSE. Some 470 enterprises were privatized in this fashion between 1992 and 1995, most of them in the first two years.[6] Secondary trading of shares was prohibited until a new Securities Law was adopted, and since the MSE was the repository of records, it was a prohibition that could not possibly be violated. On August 28, 1995 secondary trading of shares began. Basic financial information for each enterprise was printed in *Ardyn Erh* and other newspapers prior to secondary trading. While only vouchers could be used during the privatizations, only cash could be used during the secondary trading period.

There are some notable institutional differences between Mongolia's new capital market and those found in developed market economies. Mongolia's investors had to make decisions based on sparse financial information in a highly unstable macroeconomic environment. Their country was developing an entirely new political and economic system, with the very concepts of share ownership and corporate governance unfamiliar to the population and to enterprise personnel. The legal foundations of corporate governance and property rights were new and the laws rudimentary. These differences make the cross-section of returns for Mongolia particularly interesting. If the patterns in Mongolia are similar to those found elsewhere, we have a very strong statement concerning just how widespread are the returns to value stocks.

Other differences between the Mongolian experience and those of developed capital markets are useful in that they control for extraneous factors that may add noise to the analysis of data from more developed capital markets. Since the vouchers, which constitute the currency used to buy shares, were non-tradable, their sole use was for purchasing shares in enterprises.[7] Thus while investors in the USA form portfolios from an immense opportunity set including stocks, bonds, real estate, insurance, and education, investors in

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[6] The number of privatized enterprises varies among different reports because some enterprises were split up during the process of privatization, and, in a few cases, enterprises rejoined soon after privatization. Officials involved in the privatization program place the number at about 470. The privatization of large enterprises continued from 1992 through 1995, with most of the enterprises privatized early in the period.

[7] Although Boycko et al. (1994) suggest that the legal prohibition on trading of vouchers was ignored, we have never heard mention of any widespread illegal trading during hundreds of formal interviews and thousands of casual conversations. Indeed, most enterprises emerged with roughly the number of shareholders one would expect if each shareholder had spent all 7000 *VT* on a single enterprise. Evidence from a single privatization helps to illustrate the point. Denizer and Gelb (1994) report official MSE data from the privatization of the Ulaanbaatar Hotel, one of the most prestigious, and subsequently one of the most profitable, privatized enterprises. The average shareholder spent 6400 *VT*, very close to the 7000 *VT* value of blue vouchers. The five largest shareholders spent

Mongolia chose which enterprises out of less than five hundred to buy. While companies in the USA may issue various classes of common and preferred stock, convertible bonds or other quasi-equities, Mongolian enterprises had only shares. The simplicity of the investment decision reduces the chance that omitted variables are biasing or distorting the results.[8]

3. Data and empirical approach

Our data are drawn from three main sources. Share price and trading data were generated by the MSE and disseminated through newspapers, as well as provided directly to us. We compiled publicly available pre-privatization financial data for each enterprise through an exhaustive search of *Ardyn Erh*. We collected detailed information on enterprises, especially dividends, through our own sample survey in 1996. The sample included every enterprise in the large privatization program in Ulaanbaatar and in the centers of eight of the remaining twenty-one provinces of the country.[9] From these sources, we obtained all the necessary data for 141 enterprises, roughly 30 percent of the enterprises that were involved in the large privatization program.[10] Table 1 provides definitions of the variables and summary statistics.

Following common practice in studies of the cross-section of returns, we regress a measure of return on various measures of firm value and firm characteristics. Returns can be defined in a number of ways and we considered two principle variants. In one variant, returns are calculated using average prices during each of the two relevant periods of time, namely the purchase price during privatization and the sales price during secondary trading. In the second variant, returns are based on the close prices for the two periods, i.e., the prices at which final trades took place.

50,000–68,000 *VT*, or roughly 7 to 10 sets of blue vouchers each, which is entirely consistent with family size in Mongolia. Although trading was forbidden, shares could be assigned as within a family.

[8] Of course, one might wonder whether specific features of the privatization process could have generated the main results in this paper. In an appendix to an earlier version of this paper, we show that features such as the non-tradability of vouchers bias the results against the returns to value and therefore could not be generating them (Anderson et al., 1999b).

[9] The eight provinces (*aimags*) that were sampled in addition to Ulaanbaatar are Bayanolgii, Hovd, and Uvs in the far west of the country; Dornod in the far east; and Darhan, Erdenet, Tov, and Ovorhangai in the central region. Darhan and Erdenet are the second and third largest cities in Mongolia, while Ulaanbaatar, the capital city, is by far the largest with some 27 percent of the country's population.

[10] Our survey consisted of two parts, an interview with the General Director of the enterprise and a follow-up compilation of detailed financial data, including dividends. The response rate for the first part of the survey was essentially 100 percent, generating a sample of 249 enterprises, which constitutes a majority of large privatized enterprises. The financial compilation was designed to include fewer enterprises due to the greater logistical difficulties of collecting quantitative information. Only 16 out of 238 enterprises in the quantitative sample did not provide financial data, primarily for innocuous reasons, e.g., the accountant was on vacation. Only a few enterprises refused to participate, and only a single enterprise had entered formal bankruptcy. We examine the impact of the absence of data on these enterprises in Section 5. Since dividends are a key variable in our analysis, we focus on the sample used to obtain financial information, rather than on the larger sample of interviews with general directors.

Table 1
Sample information

Variable	Definition	Sources of data	Mean	Median
Total returns	The total number of *togrogs* that one would have received from investing all vouchers in an enterprise, collecting dividends, and selling at the end of June 1996.	*Ardyn Erh*, Mongolian Stock Exchange, 1996 Survey of Privatized Enterprises	32,164	14,116
Ann(R) (the dependent variable in regressions)	Annualized returns between the time of privatization and June 1996.	*Ardyn Erh*, Mongolian Stock Exchange, 1996 Survey of Privatized Enterprises	26%	22%
ME	Market equity at time of privatization, i.e., the closing share price times number of shares outstanding, in 1996 *togrogs*.	*Ardyn Erh*, Mongolian Stock Exchange	43,306,105	9,214,940
BE/ME	Ratio of book equity to market equity at time of privatization	*Ardyn Erh*, Mongolian Stock Exchange	2.3	1.0
A/BE	Ratio of assets to book equity	*Ardyn Erh*, Mongolian Stock Exchange	2.1	1.4
A/ME	Ratio of assets to market equity	*Ardyn Erh*, Mongolian Stock Exchange	3.9	2.0
$E(+)/P$	Ratio of earnings to price when the ratio is positive, zero otherwise	*Ardyn Erh*, Mongolian Stock Exchange	0.46	0.26
E-neg	Dummy equal to one when earnings are negative, zero otherwise	*Ardyn Erh*, Mongolian Stock Exchange	0.12	0.0
State	Percentage of shares retained by the state	*Ardyn Erh*, Mongolian Stock Exchange, 1996 Survey of Privatized Enterprises	17%	0%
Date	Number of days between December 31, 1991 and the sale of the first shares on the stock exchange	*Ardyn Erh*, Mongolian Stock Exchange, 1996 Survey of Privatized Enterprises	269	262
PctDAYSunsold	Percentage of days during secondary trading for which the firm's shares did not trade	Mongolian Stock Exchange	66%	77%

Average prices would provide a larger number of observations than close prices, simply because of the way in which the privatization data are reported by the MSE. The use of average prices also addresses the fact that, for some enterprises, trading during the secondary trading period was only infrequent. In one recent study of the cross-section of returns, Davis (1994) addresses the difficulty of infrequently traded stocks by focusing only on firms in the top half of the size spectrum. Knez and Ready (1997) note that companies with low nominal prices tend to have large bid–ask spreads; they avoid this difficulty by dropping companies with nominal prices less than 5 dollars. Relative to these approaches, calculating returns based on average prices conserves scarce observations. Moreover, if

the realized return is meant to proxy for the expected return faced by investors, the use of average prices would be reasonable.

Despite the consequent loss of observations, we opt for the second variant under which returns are based on close prices during the two periods of time. The use of close prices follows the literature more closely and, more importantly, presents the weaker set of results. If average prices were used, the results would show much stronger support for the returns to value. Our dependent variable is the average annual return from investing all of one's blue vouchers in an enterprise, collecting dividends through June 1996, and then selling the shares in the secondary market. This measure of return is calculated using the final purchase price during privatization, the final sale price during secondary trading, and the flow of dividends over time.[11]

The secondary trading period used for the calculation of returns was August 1995 through June 1996. This ten-month period of secondary trading coincides with the time of our survey in June 1996; it both allows sufficient trading to consider the market price indicative of average valuations and ensures that the effects of the June 30, 1996 parliamentary elections do not affect the results.[12] Our unit of observation is the return from buying shares in a single enterprise, rather than in a portfolio of shares. No theoretical basis for using portfolios as the unit of observation rather than individual securities exists and reasons to prefer the use of individual securities can be found in the literature. For example, Lo and MacKinlay (1990) find that the portfolio-grouping approach may bias test statistics and generate spurious correlations. Moreover, based on casual interviews we believe that most Mongolians chose to buy shares in a single enterprise rather than developing a portfolio, except perhaps within families. In these cases, portfolios would consist of, at most, a few securities.

Although studies of the cross-section of returns often use monthly returns, we focus on the returns received from decisions made during the privatization of enterprises, which are investments that are one-off by definition. Moreover, since shares were non-tradable between the time of voucher privatization and August 1995, which is several years in most cases, the value of the shares in the interim is impossible to determine so monthly returns did not exist. The use of a one-off approach should not affect adversely the results. Lakonishok et al. (1994) use annual buy and hold periods arguing that their procedure produces returns that are closer to those that investors can actually capture. The only returns that Mongolian investors could capture were those from the one-off investment.

For independent variables, we include the same explanatory variables used in Fama and French (1992). Book-to-market is measured by $Ln(BE/ME)$, i.e., the log of the ratio of book equity to market equity. Size is measured by the log of market equity $Ln(ME)$. Leverage is measured in turn by $Ln(A/ME)$ and $Ln(A/BE)$, which are the logs of the

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[11] Since dividends were paid at different points in time, we adjusted them to June 1996 price levels using the consumer price index plus an assumed rate of interest of 1 percent per month, which approximates the rate that could have been earned in a safe bank account. Other methods of adjusting the dividends were tried but they did not affect the results. An earlier version of this paper includes a detailed presentation of the results using alternative methods of adjusting dividends (Anderson et al., 1999b).

[12] The main results are robust to the decision to use this ten-month period. Using the very first price of the secondary trading period yielded results similar to our main results.

ratios of assets to market equity and to book equity, respectively. The earnings-to-price variables are $E(+)/P$ which equals the earnings to price ratio when earnings are positive and equals zero when earnings are negative, and E-neg which is a dummy equal to 1 when earnings are negative and to 0 when earnings are positive.[13] All accounting variables, such as assets, book equity, and earnings, are measured in the year prior to privatization.

Some of our independent variables require adjustment to account for variations in the time of privatization. An enterprise privatized in 1994 would have had a pre-privatization book value denominated in 1993 *togrogs*, whereas an enterprise privatized in 1992 would have had a book value in 1991 *togrogs*. In this example, the unadjusted book-to-market ratio for the first enterprise would be in units of 1993 *togrogs* per *VT*, while the unadjusted book-to-market for the second enterprise would be in 1991 *togrogs* per *VT*. In our results, all right-hand side variables have been deflated using the consumer price index to ensure that the same units apply to all enterprises regardless of their year of privatization.[14] This adjustment is admittedly crude since the same price index may not be appropriate for all industries and since inflation only affects certain assets and liabilities. Some adjustment is necessary, however, and Mongolia is not a country for which a variety of price indexes are available. However, none of the results of interest are affected by the adjustment process.[15]

All studies of the cross-section of returns must address a fundamental issue, namely, investors make decisions based on expectations, but only *ex-post* results are observable. In the Mongolian situation, two factors, the date of privatization and the residual state ownership, may have caused large systematic deviations between expectations and realizations. Investors in 1992 probably did not expect that they would have to wait for 3 years before their shares could be sold. Likewise, the manner in which the state would behave as an owner in the new corporate governance environment was completely unknown.[16] Therefore, we supplement our regressions with an additional specification including the percentage of shares owned by the state (*State*) and the number of days elapsed between the beginning of 1992 and privatization (*Date*) as independent variables. One could control for state ownership and the date of privatization in numerous other ways; we tried several alternative variables to ensure that our results are robust. To keep the presentation manageable, however, *State* and *Date* will serve as the default control variables. Although *State* and *Date* are useful as control variables, they may also be interpreted as indicators of the amount of risk faced by investors. Perhaps investors perceived partial state ownership as an indication of soft-budgets and safety. On the other hand, investors who exercised their vouchers early did so in an environment of

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[13] The earnings-to-price ratio is segmented into two variables in this fashion because negative long-term growth rates are not consistent with positive prices (Fama and French, 1992).

[14] After deflating, BE/ME, A/ME, and $E(+)/P$ are all denominated in units of 1991 *togrogs* per *VT*. The other right-hand-side variables do not require deflating. *ME* is in units of *VT* and A/BE has no units since the units in the numerator and the denominator are the same.

[15] Indeed, the first drafts of this paper used unadjusted variables. The main differences between the results presented here and the results obtained using unadjusted variables is that the regressions with unadjusted variables tend to have higher R-squares, and tend to be more sensitive to the use of the variable for privatization date, for obvious reasons.

[16] For example, elections in the summer of 1992 led to a major change in government and a major change in the ideological approach to reforms.

greater uncertainty so that the coefficient on *Date* may reflect a return for absorbing that uncertainty.

4. The basic results

In this section, we outline the basic results derived from regressing returns on the book-to-market ratio, size, leverage, and the earnings-to-price ratio. We also consider the impact of controlling for the date of privatization and the percentage of shares owned by the state. Table 2 presents the basic results. The strongest result is the positive and highly significant coefficient on the book-to-market ratio in every equation, a finding that is consistent with studies of the cross-section of returns in developed countries. In light of the unusual institutional history of Mongolia and the novelty of the dataset, the ubiquity and magnitude of the returns to value are notable. The coefficient on book-to-market ranges from 0.14 to 0.21 so that even the lowest estimate of the coefficient on book-to-market indicates an economically significant effect on returns. Some simple calculations place the

Table 2
Basic ordinary least squares regressions

Book-to-market	Size	Leverage		Earnings-to-price					
Ln(*BE/ME*)	Ln(*ME*)	Ln(*A/BE*)	Ln(*A/ME*)	*E*(+)/*P*	*E*-neg	*Date*	*State*	R^2	Adj R^2
0.21								0.31	0.31
(7.94)									
	−0.12							0.19	0.19
	(5.72)								
		−0.21	0.21					0.31	0.31
		(3.64)	(7.73)						
				0.30	0.24			0.21	0.20
				(5.97)	(1.77)				
0.17	−0.01		−0.01	0.19	0.05			0.39	0.36
(2.89)	(0.31)		(0.11)	(3.96)	(0.43)				
0.16	−0.01	−0.01		0.19	0.05			0.39	0.36
(3.95)	(0.31)	(0.11)		(3.96)	(0.43)				
0.20						−0.0019	−0.18	0.44	0.43
(8.20)						(5.38)	(1.47)		
	−0.13					−0.0014	−0.09	0.36	0.35
	(6.51)					(6.04)	(0.73)		
		−0.18	0.20			−0.0012	−0.18	0.44	0.42
		(3.41)	(8.07)			(5.38)	(1.52)		
				0.27	0.27	−0.0012	−0.01	0.33	0.31
				(5.60)	(2.14)	(4.93)	(0.08)		
0.14	−0.03		0.00	0.16	0.08	−0.0011	−0.11	0.49	0.47
(2.49)	(1.02)		(0.09)	(3.51)	(0.74)	(5.20)	(0.91)		
0.14	−0.03	0.00		0.16	0.08	−0.0011	−0.11	0.49	0.47
(3.56)	(1.02)	(0.09)		(3.51)	(0.74)	(5.20)	(0.91)		

Note. This table contains the results of ordinary least squares regressions in which the dependent variable is Ann(*R*). All equations include an intercept, and the absolute values of the *t*-ratios are in parentheses; $n = 141$ for all equations (cf. Table 3).

book-to-market effect in perspective.[17] A household that invested its vouchers in the 20 highest book-to-market enterprises would have received returns equivalent to more than nine months' income. By contrast, a household investing in the 20 lowest book-to-market enterprises would have gained less than two months' income.

The coefficient on size always has a negative sign, but its significance is much less robust than that of the book-to-market coefficient. Size is highly significant except when the equation includes the book-to-market ratio in which case it drops in significance. When the ratios of assets to book equity and market equity are both included on the right-hand side, they are both highly significant, of opposite sign, and their coefficients are similar in absolute value. When either measure of leverage is combined with the book-to-market ratio, the book-to-market ratio always remains highly significant and leverage loses significance.[18] These results are similar to those found in Fama and French (1992).

The earnings-to-price ratio is a more consistent correlate of returns in Mongolian than in studies of the US market (Fama and French, 1992; Davis, 1994). In the Mongolian case, the earnings-to-price ratio is always positive and significant at a high level. The dummy for negative earnings has a positive sign, as in Fama and French, suggesting that enterprises with negative earnings had higher returns than enterprises with zero earnings, but is significant only when the book-to-market ratio is not included. Since the earnings-to-price ratio and the book-to-market ratio are both measures of value, we find that value stocks earned higher returns than glamour stocks in Mongolia.

The variable for residual state ownership always has a negative coefficient, but it is generally not significant or only significant at low levels. One interpretation of this result is that, between the time of privatization and June 1996, Mongolian citizens and the Mongolian government came to realize that the state did not have the resources to help struggling enterprises (Anderson et al., 2000). However, there are two reasons to consider carefully the effect of residual state ownership. As currently specified, the model tests for the existence of a linear fit between log returns and the percentage of shares retained by the state. However, the difference between 10 and 40 percent state ownership may be less important than the difference between 49 and 51 percent state ownership. Since Mongolia's laws of corporate governance[19] do not allow for cumulative voting, the distinction is even more important because, for companies with 51 percent state ownership, the state can appoint the entire board. Hence, we tested the impact of state ownership using a dummy variable for majority state ownership and another dummy for minority state ownership. The results are virtually the same as those found using the percentage state ownership.

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[17] These examples are based on the average household size of 4.5 persons and assume that all vouchers earned the average return of the 20 enterprises with the highest and lowest book-to-market ratios. The benchmark used for comparison is average total household income in June 1996, which includes wages and salaries, pensions, business income, and investment income (State Statistical Office, 1997).

[18] Given the identity relationship between $Ln(BE/ME)$ and $Ln(A/ME)$ and $Ln(A/BE)$, it is impossible to use all three as independent variables.

[19] The Economic Entities Law of 1991, amended in 1993, and its replacement, the Companies and Partnerships Law of 1995, are the relevant pieces of legislation. Anderson et al. (1999a) provide details on corporate governance institutions.

A second concern is that post-privatization performance of enterprises and the level of state ownership may both be endogenous (Frydman et al., 1999; Djankov and Murrell, 2002). For example, if fully private enterprises perform better than partially private enterprises, the level of state ownership may not be the cause for this difference because an equally plausible hypothesis is that the state retained partial ownership in enterprises that it expected to perform poorly in a free market environment. Our dependent variable includes privatization prices in the denominator to temper this concern, because these prices were generated with full knowledge of state ownership. If an enterprise was expected to perform poorly, this should be reflected in the privatization price, and consequently, in returns. However, some factor known to the state but unknown to investors may have influenced both the state's decision on the number of shares to retain and the returns earned by voucher investors for enterprises with residual state ownership. For example, suppose that the state intentionally retained shares in enterprises with modern Western equipment, but this fact was not generally known to the public. Then, a positive coefficient on *State* could reflect the impact of the modern equipment rather than the impact of state ownership.

To test for the impact of endogeneity, we sought instruments that would be correlated with state ownership, but not related to the returns earned by investors. We use the following instruments: the year the enterprise was established, the level of employment prior to privatization, the percentage of enterprise output subject to state orders in 1990, the levels of foreign accounts receivable and foreign accounts payable in 1990, and the size in 1990 of the enterprise's economic and social development fund, which was a dedicated equity fund under the old socialist accounting system. These variables are correlated with the size of residual state ownership, but there is no reason to believe that they are determinants of returns. The two-stage least squares results are very similar to those using ordinary least squares.[20] Although the effect of state ownership is interesting in its own right, our purpose here is to ensure that endogeneity is not affecting the main results concerning the relationship between returns and value. In fact, the coefficient on book-to-market changes hardly at all when instrumental variables are used.[21]

The variable *Date* is the number of days between December 31, 1991 and the date of the sale of the first shares on the stock exchange during privatization. The coefficient on *Date* is always negative and highly significant, indicating that enterprises privatized earlier had higher returns. With coefficients ranging from -0.0011 to -0.0019, the economic significance is also high. For example, an investor who waited six months to buy shares would have earned 20 percent higher returns. The coefficient on *Date* does not reflect the time value of money because the vouchers had no alternative uses for most people. The coefficient on *Date* could represent a decline in the perception of the risk entailed in buying

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[20] An ordinary least squares regression of residual state ownership on these six instruments yields an R-square of 0.20. Although employment at the time of privatization might be an inappropriate instrument since size has an impact on returns, we have already accounted for size, as measured by market equity, in our basic specification. However, to ensure that an inappropriate instrument was not distorting results, we also used the other instruments excluding employment and the results were not appreciably different. An OLS regression of state ownership on the remaining five instruments yields an R-square of 0.14.

[21] The pattern between the book-to-market ratio and returns holds also for the subsample of enterprises that were 100 percent privatized.

into a specific enterprise because fewer and fewer enterprises were left to be privatized over time and more information concerning the progress of the economy and of government policy became available. Later investors had the luxury of observing the progress of economic reforms and the development of the institutions of corporate governance, and it was easier to estimate opportunity costs with fewer enterprises available. Therefore, the coefficient on *Date* may reflect differences in opportunities faced by early and late investors, as well as the greater risk absorbed by early investors.

The variable *Date* is only one proxy for the secular effect that time may have had on returns, so we consider alternative proxies. First, as each enterprise was privatized, the number of enterprises from which to choose declined so that early investors gave up options. Since a large number of enterprises were privatized early, the number of enterprises remaining might be a more appropriate variable to control for this option value of waiting. Second, an important difference between our Mongolian study and those of stock markets in developed countries is that different enterprises had their shares on sale at different times, e.g., an enterprise privatized in 1992 did not trade at the same time as one privatized in 1995, whereas the shares of the companies traditionally studied all trade concurrently. Comparability of the present results with those in the literature would be stronger if this dissimilarity could be addressed.

We employed two alternatives to capture these effects. First, we included the order in which an enterprise was privatized, i.e., the first enterprise privatized was given a value of one, the second two, and so on. Using the order privatized, rather than the date, captures the declining size of the opportunity set and the option value of waiting. Second, we included a system of dummy variables, one for each two-month period. Bimonthly dummies remove the effect of between-group comparisons, since each group of enterprises has its own intercept. Hence, the coefficient on book-to-market should capture more accurately the relationships between enterprises that traded concurrently. Including time dummies in this fashion controls for the effects of time more powerfully because the time effect need not be linear, or even monotonic. The basic results are unchanged when these alternatives to *Date* are used. When the order privatized is employed, the coefficient on book-to-market changes very little in magnitude and remains statistically significant at a very high level. When the system of bi-monthly time dummies is used, the coefficient on book-to-market actually increases and has a slightly larger *t*-statistic.

Our results are extremely robust to changes in specification and sample. In exhaustive tests, the basic relationships between returns and measures of value are robust to changes in assumptions about the appropriate deflator for nominal variables, to the selection of price, and to the use of annual percentage returns for the dependent variable. The results are also robust for subsamples, e.g., firms with the greatest level of secondary trading and firms with no residual state ownership. In every case, the economic and statistical significance of the measures of value, the book-to-market ratio and earnings-to-price ratio, are confirmed. Since the variables used are conservative in the sense that they produce the least supportive results, the robustness to specification changes and different samples provides a powerful reaffirmation that value stocks earned higher returns in Mongolia.

5. Why the returns to value in Mongolia?

The body of evidence confirming the relationship between value and average returns now has a novel data point, namely, voucher privatization in Mongolia. Our results exhibit both the economic and statistical strength of this relationship and its robustness to numerous changes in specification and sample. Given that our data reflects the results of a natural market experiment conducted in an environment whose characteristics differ greatly from markets that generated the original evidence on the returns to value, our paper suggests that such returns may be a deep-rooted property of stock markets.

In the literature on the cross-section of returns, several competing explanations for the reasons for the superior returns to value are found. One conjecture maintains that the results are mirages and are generated by survivorship bias, look-ahead bias, or extensive data snooping. A second explanation is that higher returns to value stocks are compensation for some risk factor associated with value. A third hypothesis argues that the results do not represent risk, but rather mispricing. Due to agency problems, investor psychology, or irrational behavior, investors systematically pay too much for glamour stocks and too little for value stocks. The features of Mongolia's social experiment with mass privatization make some explanations of the higher returns to value highly implausible but support the plausibility of others.

Kothari et al. (1995) suggest that the book-to-market results found by Fama and French have been influenced by survivorship bias, but survivorship bias, *per se*, is unlikely to have played a role in our results. With the exception of the information on dividends, all variables in our equations use data drawn from either MSE records or from enterprise-level information printed in the national newspapers prior to privatization. No survivorship bias is associated with either of these sources, since the set of included enterprises was generated prior to privatization. If survivorship bias exists, it would have to come from our sampling procedures that compiled the information on dividends. A brief outline of these procedures allows us to examine whether sampling could have imparted a survivorship bias.

Our sample was constructed using official privatization records and included all privatized enterprises in Ulaanbaatar and the capitals of eight of the remaining twenty-one administrative districts (*aimags*) in Mongolia. There were 16 enterprises, which constitutes 7 percent of the firms, in these regions that could be considered non-survivors in the sense that they were not surveyed and thus not included in our analysis. In most cases, an enterprise was not surveyed simply because the enterprise accountant was unavailable. In a few cases, the enterprises did not cooperate; in only one case was the enterprise formally bankrupt. Other enterprises were not surveyed simply because they were located outside the geographical area of the sample. As Mongolia is the size of Western Europe with rough terrain and poor infrastructure, our sample was designed to maximize the number of observations by focusing on towns and urban areas.

The returns to holding a stock consist of both capital gains which are based on the purchase and sales prices, and dividends but only the latter comes from our sample survey. The data on prices was drawn from MSE records and newspaper announcements. Therefore, we can examine the impact of sample selection by examining the relationship between the capital gains portion of returns and measures of value. We regressed capital gains on the book-to-market ratio and the other right-hand-side variables of the basic

Table 3
Capital gains regressions in-sample and out-of-sample

	Book-to-market	Size	Leverage	Earnings-to-price		Date	State	R^2	Adj R^2	n
	Ln(BE/ME)	Ln(ME)	Ln(A/ME)	$E(+)/P$	E-neg					
Enterprises in the sample	0.20 (3.30)	0.01 (0.27)	−0.04 (0.79)	0.11 (2.26)	0.01 (0.11)			0.27	0.24	141
Enterprises out of the sample	0.09 (1.08)	0.04 (0.88)	−0.02 (0.26)	0.18 (3.82)	−0.15 (1.45)			0.17	0.15	155
Enterprises in the sample and out of the sample	0.13 (2.45)	0.05 (1.91)	0.01 (0.28)	0.14 (3.94)	−0.20 (2.38)			0.18	0.16	296
Enterprises in the sample	0.18 (3.17)	0.01 (0.27)	−0.01 (0.21)	0.07 (1.47)	−0.01 (0.05)	−0.0007 (3.11)	−0.48 (3.95)	0.39	0.36	141
Enterprises out of the sample	0.04 (0.42)	0.04 (0.80)	0.02 (0.30)	0.16 (3.45)	−0.13 (1.27)	−0.0001 (0.24)	−0.37 (2.75)	0.22	0.18	155
Enterprises in the sample and out of the sample	0.08 (1.61)	0.03 (1.24)	0.04 (0.78)	0.12 (3.38)	−0.18 (2.28)	−0.0005 (2.69)	−0.46 (4.76)	0.26	0.24	296

Note. The first two panels of this table contain the results of ordinary least squares regressions as in Table 2, except that the dependent variable is the annual return based only on capital gains. Capital gains are based only on the close prices from initial privatization and from secondary trading. The purpose is to examine the impact of sample selection on the results. Since we do not have data on dividends for enterprises outside of our survey sample, total returns cannot be calculated for these firms. Enterprises in the sample refers to the enterprises that were included in our survey sample and for which the other necessary data existed. Enterprises out of the sample refers to the enterprises that were not included in our survey sample, but for which the other necessary data existed. All equations in this panel include an intercept, and the absolute values of *t*-ratios are in parentheses.

equation for enterprises both within our sample and outside of our sample. Table 3 indicates that for the firms outside of our sample area, the coefficient on the book-to-market ratio loses significance, while a different measure of value, the earnings-to-price ratio, increases in importance. Out-of-sample firms are more likely not to trade during the secondary trading period which suggests that a non-trivial number could be considered non-survivors. This fact presents an econometric problem because non-trading firms have been treated as if they had no market value so far. Given that there were only four such firms in our basic sample, this assumption was not unreasonable and did not affect the results. However, with a larger proportion of non-traders among the out-of-sample firms, a censored regression model is more appropriate. To pursue this issue, a TOBIT specification was estimated for firms both in-sample and out-of-sample and the results mirror closely those of the standard OLS regressions.

In summary, when examining only the capital gains portion of returns, the fundamental ratio with the most explanatory power is different for in-sample and out-of-sample firms. While both the book-to-market and earnings-to-price ratios are important for the in-sample firms, only the earnings-to-price ratio is important for out-of-sample firms. When

examining in-sample and out-of-sample firms together, both measures of value remain significant determinants of returns, but at modest levels of significance. Hence, the results from Mongolia show that sampling considerations do influence the empirical findings, but do not overturn the fundamental result. Even in the regressions that generate the lowest coefficient for the book-to-market ratio, the effect is transferred to the earnings-to-price ratio, which is another measure of value. These findings lend modest support to other studies indicating that the cross-section of returns is not due entirely to survivorship bias, e.g., Davis (1994), Chan et al. (1995), Lakonishok et al. (1994), Bagella et al. (2000).

Black (1995) and MacKinlay (1995) warn that extra-normal returns found in studies of the cross-section of returns may have been influenced by extensive data-snooping. Lo and MacKinlay (1990) suggest that grouping data by empirically motivated fundamental attributes subjects the tests to data-snooping biases. Merton (1987) asks whether it reasonable to use the standard t-statistic as a valid measure of significance when the test is conducted on the same data that are used by earlier studies whose results influence the choice of theory to be tested. Our findings cannot be the result of data snooping because our choice of explanatory variables and functional forms is dictated largely by earlier studies and the data from Mongolia have not been snooped.

Fama and French (1992, 1993, 1995, 1996) suggest that the higher returns to value stocks reflect underlying risk factors and the market's pricing of those risks. Lakonishok et al. (1994) argue that if value proxies for risk, we should observe value stocks underperforming relative to glamour stocks in some states of the world, particularly in bad states in which the marginal utility of wealth is high so that value stocks are unattractive to risk-averse investors. Lakonishok et al. then show that a value strategy based on the book-to-market ratio outperformed a glamour strategy in 17 out of 22 years. Furthermore, the years in which glamour stocks outperformed value stocks were not bad years in the sense of economic recession or declining stock markets. From examining the standard deviation of returns for value and glamour portfolios, they find that, although value portfolios have slightly larger standard deviations, the difference is mostly attributable to size and, in any event, it is not large enough to explain the large difference in returns between value and glamour. In short, these authors find no evidence that the higher returns to value strategies were due to risk.

Our approach to risk is similar in spirit to that of Lakonishok et al. If the book-to-market ratio is proxying for risk, we should observe two things. First, high book-to-market enterprises would have higher returns on average. Second, the variation in returns should be higher for high book-to-market enterprises than for low book-to-market enterprises. To see if the Mongolian data fit this simple proposition about risk, we sorted enterprises according to their book-to-market ratios and placed them into portfolios. For each portfolio of 14 firms, we calculated the average return and the standard deviation; the results are presented in Fig. 1. If book-to-market is a proxy for risk, both the average return and standard deviation should be higher for high book-to-market firms. However, as Fig. 1 makes clear, higher returns did not come at the cost of higher variation. More formally, if high book-to-market stocks were riskier, the relationship between returns and book-to-market would be heteroskedastic. We first regressed returns on Ln(BE/ME), then regressed the squared residuals from the first regression on Ln(BE/ME). If book-to-market is a proxy for risk, the coefficient in the second regression should be positive and significant. While
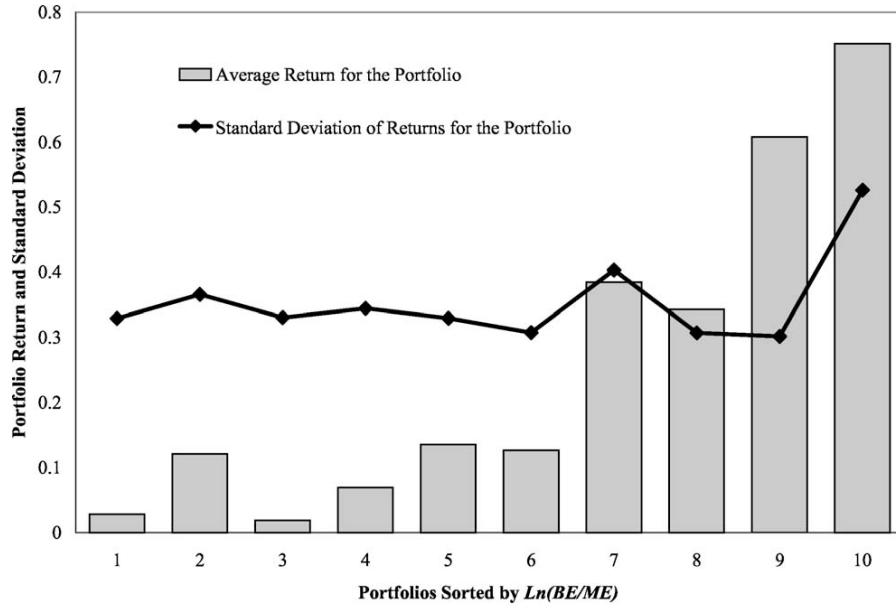
Fig. 1. Returns and risk?

this coefficient is positive, it is not significant and has no explanatory power. Using simple variation in returns as a measure of risk, high book-to-market enterprises were not more risky than low book-to-market enterprises in Mongolia.[22]

Another risk that investors might have considered, namely, liquidity risk, would not be captured in the variation in returns. We examined the relationship between the book-to-market ratio and two measures of liquidity during the secondary trading period, namely, the percentage of days for which an enterprise had at least one trade and the turnover of shares. The book-to-market ratio is negatively correlated with the number of days traded and positively correlated with share turnover. Thus, high book-to-market enterprises were less liquid by one measure and more liquid the other. However, the more important issue is whether the returns to high book-to-market enterprises can be explained by liquidity risk.[23] We define *PctDAYSunsold* as the percentage of secondary trading days in which not a single share of the enterprise changed hands, which is a measure of illiquidity. Table 4 presents the results from adding *PctDAYSunsold* to the right-hand side of our basic equations. The new variable causes the coefficients and *t*-statistics on the book-to-market ratio and the earnings-to-price ratio to decline, suggesting that the higher returns

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[22] For the earnings-to-price ratio, the coefficient is positive and highly significant. However, this result is driven entirely by a single outlier.

[23] Since the book-to-market ratio is positively related to share turnover, which is inversely related to liquidity risk, the share-turnover variable cannot be relevant and we eliminate it from the discussion.

Table 4
Returns, liquidity, and value

Book-to-market	Size	Leverage	Earnings-to-price		*Date*	*State*	*PctDAYSunsold*	R^2	Adj R^2	*n*
Ln(*BE/ME*)	Ln(*ME*)	Ln(*A/ME*)	*E*(+)/*P*	*E*-neg						
0.21								0.31	0.31	141
(7.94)										
							−0.06	0.00	−0.01	141
							(0.49)			
0.17	−0.01	−0.01	0.19	0.05				0.39	0.36	141
(2.89)	(0.31)	(0.11)	(3.96)	(0.43)						
0.12	−0.12	0.01	0.14	−0.02			−0.66	0.49	0.47	141
(2.15)	(3.64)	(0.28)	(3.09)	(0.21)			(5.37)			
0.14	−0.03	0.00	0.16	0.08	−0.0011	−0.11		0.49	0.47	141
(2.49)	(1.02)	(0.09)	(3.51)	(0.74)	(5.20)	(0.91)				
0.10	−0.12	0.00	0.14	0.03	−0.0007	0.14	−0.55	0.54	0.51	141
(1.95)	(3.33)	(0.09)	(3.17)	(0.26)	(3.12)	(1.03)	(3.65)			

Note. This table contains the results of ordinary least squares regressions as in Table 2, with an additional right-hand-side variable. *PctDAYSunsold* is the percentage of secondary trading days during which not a single share of the enterprise changed hands, which is a measure of liquidity risk. All equations include an intercept, and the absolute values of *t*-ratios are in parentheses.

associated with value can be explained partially by liquidity. However, these coefficients remain strong, both economically and statistically.

Since value stocks do seem to be riskier in that they trade less frequently during secondary trading, some indication of the relative contribution of risk would be useful. The *R*-squares in Table 4 indicate that the book-to-market ratio alone explains 31 percent of the variation in returns and, when the other fundamental variables are added, 39 percent of the variation in returns is explained. When *Date* and *State* are included, explained variation increases to 49 percent. By contrast, our measure of illiquidity explains none of the variation in returns when used in isolation and adds between 6 and 10 percent explanatory power when added to the basic equations. While risk does play some role in explaining the relationship between average returns and value, most of the relationship remains unexplained after accounting for liquidity risk.

A final element of risk warrants discussion for the Mongolian case. Investors who exercised their vouchers early took greater risk by using their vouchers in the environment of greatest uncertainty. As is clear from many tables in this paper, *Date* is negatively correlated with returns, which is completely consistent with a risk story. However, accounting for *Date* results in only modest declines in the importance of the value ratios for explaining returns, which can be seen by comparing the first two panels of Table 2. The measures of value, the book-to-market ratio and the earnings-to-price ratio, remain important even after accounting for this type of risk. Our results on the explanatory power of risk for explaining returns to value stocks in Mongolia's privatization experiment are consistent with those of Lakonishok et al. (1994), La Porta (1996), Jensen et al. (1998), and Bagella et al. (2000), all of whom find that the superior returns to value strategies cannot be explained by risk alone.

Daniel and Titman (1997) find that high book-to-market stocks covary strongly with other high book-to-market stocks because they tend to be in related lines of businesses, in the same industries, or from the same regions. As a simple test of whether enterprise characteristics are important in explaining returns, we add industry dummies, regional dummies, and an urban–rural dummy to our basic equation. Although regional effects do seem to have an effect on returns in that investors in urban enterprises do better, controlling for these enterprise characteristics had little appreciable impact on the variables of interest.[24] The strong relationship between returns and the book-to-market ratio does not appear to be attributable to such easily observed characteristics as sector or region. However, the earlier finding that the returns to value stocks are weaker for firms outside of our geographical sample suggests that the relationship between characteristics and the returns to value should not be ignored.

Another explanation for the returns to value holds that investors make mistakes leading to prices that are too low for value stocks and too high for glamour stocks,[25] perhaps due to over-reaction to good news or bad news. Contributions to the literature include DeBondt and Thaler (1985), Bauman and Miller (1997), Daniel et al. (1998), La Porta (1996), Rau and Vermaelen (1998), and Barberis et al. (1998). The common theme is that pricing mistakes are linked to the past and caused by adaptive expectations or improper extrapolation of past trends. Lakonishok et al. (1994) test this conjecture by using various price multiples, i.e., cash-flow-to-price, book-to-market, and earnings-to-price, as indicators of expectations of future performance, and past growth variables, notably the growth of sales, as indicators of the existing information upon which investors form their expectations. Their analysis indicates that a strategy of buying stocks with low growth in the past and low expectations of future growth yields the highest returns.

We replicate their approach and find analogous results with regard to expected future performance in that measures of value, especially the cash-flow-to-price ratio and the book-to-market ratio, help explain the cross-section of returns. However, we find that indicators of prior growth do not help explain returns. Since the growth of sales prior to privatization may be a particularly bad measure of growth experience for a country in transition from a planned to a market economy, we also used the growth of value-added per employee to capture prior growth, but it also had no effect. These results are consistent with Dechow and Sloan (1997) who find no systematic evidence that stock prices reflect naive extrapolation of past trends. Segmenting expectations of future performance from extrapolation of past performance does not help explain the returns to value in Mongolia. However, Mongolia's

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[24] For example, when thirteen province-district dummies and six sector dummies are added to the basic equation, the book-to-market ratio remains significant with a t-statistic of 2.18.

[25] Ikenberry et al. (1995) find superior returns to value stocks following open-market share repurchases. Rozeff and Zaman (1998) find that insider buying increases as stocks change from growth to value categories. Both studies support the notion that prices of value stocks tend to lie below fundamental values. The implicit presumption that insiders have better knowledge about the fundamental prospects of the company is supported by these studies. In Mongolia, we also find that insider purchases, by management, not workers, during secondary trading are both higher for value stocks than for glamour stocks and positively correlated with returns. However, since management purchasing has an effect on price and, therefore, on returns, it is not clear which direction the causality runs. Whether management is reacting to underpricing during the privatization period or is generating overpricing during the secondary trading period is an open question.

experience in the 1990s regarding extrapolation of past trends may not generalize to other countries. First, most investors had at their disposal only the static information that was printed in the newspapers prior to privatization. The average investor could not know the growth of sales or growth of value added. Due to the non-tradability of vouchers, holders of private information were constrained in their ability to profit from their information so that prices would be less likely to embody that private information. Second, the transition from a centrally controlled economic system based on state ownership to a decentralized market system based on private property may have made prior growth rates irrelevant.

Lakonishok et al. (1992) catalogue a host of agency problems that plague professional investment organizations, especially pension funds. La Porta et al. (1997) suggest that agency problems may help explain the persistent differences in average returns between value and glamour stocks because sophisticated institutional investors may gravitate toward well-known, glamour stocks since these stocks are easier to justify to clients and to superiors as prudent investments. However, agency issues cannot explain the Mongolian results. Although mutual funds were available to investors, Mongolians virtually ignored them with only two percent of the shares bought by mutual funds (Korsun and Murrell, 1995).[26] Mongolians preferred to make their own investment decisions so that the agency story cannot explain the returns to value stocks in Mongolia.

La Porta et al. (1997) propose that investors may prefer to invest in good companies with high profitability and superior management, and that unsophisticated investors may equate a good company with a good investment independent of price. Investors in Mongolia's voucher-oriented privatization experiment selected enterprise shares without the benefit of prior price history. On the supply side, employees of the MSE had to simulate a supply curve by auctioning blocks of shares to the highest bidders, but there was no reservation price because all shares had to be sold. Mongolian investors placed their orders to buy shares either at a specified price or at the market price. Since some investors chose the latter option, the market was being simulated on both the supply and the demand side, at least during the early rounds of an enterprise's privatization. Only during later stages of an enterprise's privatization did investors have some concept of the price history and the relative popularity of an enterprise. Hence, this explanation may fit well the Mongolian experience.

To test this conjecture, we restate the variables on the right-hand-side of the basic regressions to reflect an indication of the price history available at the time an investor selected the company by using the average privatization price rather than the closing price in the denominator. The coefficient on the book-to-market ratio and its level of statistical significance decline, although it remains modestly significant. Hence, placing orders at the market price in an environment in which the supply side is being simulated may have contributed to the overpricing of glamour stocks and the underpricing of value stocks. This explanation is not specific to Mongolia since a large proportion of orders on both

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[26] In contrast, investment funds were relatively more important in the Czech and Slovak Republics as Shafik (1995), Claessens (1997), Marcincin and van Wijnbergen (1997), and Hingorani et al. (1997) report.

the buy and the sell side are made at the market price in the USA.[27] The notion that investors may have equated a good company with a good investment independent of price is supported by examining the determinants of prices in both the privatization and secondary trading periods. In both periods, systematic accounting information was published in the newspapers prior to trading. We regressed share price on the per-share valuations of key balance sheet and income statement variables, including current and fixed assets, current and long-term debt, and profits. During the privatization period, the only two pieces of accounting information related significantly to price are the reported profits per share and the overall book value of the company. In contrast, during the secondary trading period all of the accounting variables are significant at high levels, each with the expected sign, the only exception being that a premium was placed on smaller firms, not larger ones. One possible interpretation is that investors learned from the privatization experience that profitability and size alone are not good predictors of investment performance and that size may even be a hindrance.

Annual returns, the dependent variable in our basic regressions, incorporates both the privatization price and the secondary trading price. Since each of these components of returns was determined by investor behavior at the respective times, we regress returns on the fundamental accounting information presented in the newspapers during each of the two periods. Our results suggest that returns were significantly higher for firms with lower profitability during privatization, perhaps reflecting an overemphasis on profitability in the establishment of prices at that time.[28] Lakonishok, Shleifer, and Vishny suggest that returns to value may be generated by investor behavior in which a good company is equated with a good investment irrespective of price. If this were the case, prices would differ from those justifiable on the basis of publicly available accounting benchmarks, such as the book value of the company, and this would explain why firms with higher book-to-market ratios earned higher returns. In Mongolia, the strong positive relationship between pre-privatization profitability and privatization prices and the subsequent negative relationship between returns and privatization prices supports this hypothesis.

6. Concluding remarks

In Mongolia's privatization program, citizens bought shares of companies using vouchers. They earned the right to collect dividends and the right to vote for members of supervisory boards and other matters in shareholders' meetings. They reaped the returns and bore the risks associated with a market-determined share price. These similarities to

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[27] Harris and Hasbrouck (1996) report some basic statistics for their sample of trades taken from the automated SuperDOT system on the NYSE from November 1990 through January 1991. In their sample, 47 percent of sell orders and 53 percent of buy orders were market orders.

[28] Returns over the span of the two periods are also higher for firms with higher profitability and higher current assets reported just prior to secondary trading, perhaps reflecting a greater appreciation for the liquidity of firm balance sheets. This result is not inconsistent with the positive sign on the earnings-to-price ratio in earlier regressions. If the market overemphasized earnings in price formation, prices would be bid too high for firms with high earnings so that such firms would have low ratios of earnings to price. If the market then corrected its mistake, low returns would be associated with firms with lower values of $E(+)/P$.

developed country stock exchanges make the Mongolian case an interesting new data point for the examination of the cross-section of returns, despite the diminished comparability of an atypical institutional setting. We show that the returns to voucher investment in Mongolia demonstrates patterns that are similar to those found in studies of more developed capital markets. Our main result is that companies with high book-to-market ratios earned superior returns for investors. The economic significance of this difference in returns is important. Although non-transparencies in the privatization programs of other transition countries have been blamed for widening the gap between the rich and the poor, we find that, even in the relatively transparent[29] Mongolian exchange, a simple strategy of buying value stocks had an important impact on wealth. Mongolians who used their vouchers to buy shares in the 20 companies with the highest book-to-market values received returns equivalent to nine month's income, while those buying shares in the 20 lowest book-to-market companies gained but two months' income.

Because stock trading occurred in a peculiar institutional setting, the data can be used to examine the underlying causes of the higher returns of value stocks. Returns to value could not be due to data snooping in Mongolia because our empirical approach is driven by earlier studies in other countries and the data in Mongolia have certainly never before been snooped. Superior returns to value stocks cannot be due to agency problems within investment companies, since investment companies played a trivial role in Mongolia's privatization. We find that regional and industry characteristics contribute to the high returns to value stocks, but do not explain the results entirely. We find no support for the proposition that investors extrapolated past rates of growth improperly. The book-to-market ratio appears to carry some information about risk, but even after controlling for risk, value stocks earn higher returns. The argument that people buy irrespective of price may be relevant to the Mongolian case. The mass privatization involved market simulation; the supply side consisted of employees of the stock exchange, and on the demand side many participants placed orders at the market price.

Whatever the reasons for the pattern, the cross-section of initial post-privatization returns in the relatively heavily regulated exchange in Mongolia suggests that a simple, publicly available, piece of accounting information was not fully reflected in share prices. Since the higher returns to value do not seem to be attributable to risk, one interpretation of this finding is that the market was not behaving efficiently,[30] at least in the earliest phase of its life. Yet, the findings in Mongolia are consistent with empirical studies in other countries so that, by this yardstick, the contrived stock market created to facilitate privatization in the land of Chingis Khan behaved with a level of efficiency not unlike mature stock markets in rich countries.

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[29] Consider this description of the Czech experience: "In the Czech stock market, the prices at which shares are traded are often a mystery. Investors can trade on the Prague Stock Exchange or through a chain of share shops called the RM-System. Most deals, however, are struck in private by the voucher funds. They are also given a privileged view of companies' inner workings through seats on their boards." (*Economist*, April 13, 1996, p. 73; cited in Hanousek and Filer, 2000, p. 63.)

[30] Hanousek and Filer (2000) examine efficiency in Poland, Hungary, and the Czech Republic, and Rockinger and Urga (2000) examine efficiency in the same countries and in Russia.

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References

Anderson, James H., Korsun, Georges, Murrell, Peter, 1997. Enterprise–state relations after mass privatization: Their character in Mongolia. MOCT–MOST 7 (4), 81–99.

Anderson, James H., Korsun, Georges, Murrell, Peter, 1999a. Ownership, exit, and voice after mass privatization: Evidence from Mongolia. Economics of Transition 7 (1), 215–243.

Anderson, James H., Korsun, Georges, Murrell, Peter, 1999b. Glamour and value in the land of Chingis Khan. Working paper available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=149770. Social Sciences Research Network, Rochester, NY.

Anderson, James H., Korsun, Georges, Murrell, Peter, 2000. Which enterprises (believe they) have soft budgets? Evidence on the effects of ownership and decentralization in Mongolia. Journal of Comparative Economics 28 (2), 219–246.

Bagella, Michele, Becchetti, Leonardo, Carpentieri, Andrea, 2000. 'The first shall be last': Size and value strategy premia at the London Stock Exchange. Journal of Banking and Finance 24 (6), 893–919.

Barberis, Nicholas, Shleifer, Andrei, Vishny, Robert W., 1998. A model of investor sentiment. Journal of Financial Economics 49 (3), 307–343.

Bauman, W. Scott, Miller, Robert E., 1997. Investor expectations and the performance of value stocks versus growth stocks. Journal of Portfolio Management 23 (3), 57–68.

Black, Fischer, 1995. Estimating expected return. Financial Analyst Journal 51 (1), 168–171.

Boycko, Maxim, Shleifer, Andrei, Vishny, Robert W., 1994. Voucher privatization. Journal of Financial Economics 35 (2), 249–266.

Capaul, Carlo, Rowley, Ian, Sharpe, William F., 1993. International value and growth stock returns. Financial Analyst Journal 49 (1), 27–36.

Chan, Louis K.C., Hamao, Yasushi, Lakonishok, Josef, 1991. Fundamentals and stock returns in Japan. Journal of Finance 46 (5), 1739–1764.

Chan, Louis K.C., Jegadeesh, Narasimhan, Lakonishok, Josef, 1995. Evaluating the performance of value versus glamour stocks—The impact of selection bias. Journal of Financial Economics 38 (3), 269–296.

Claessens, Stijn, 1997. Corporate governance and equity prices: Evidence from the Czech and Slovak Republics. Journal of Finance 52 (4), 1641–1658.

Claessens, Stijn, Djankov, Simeon, Klingebiel, Daniela, 2001. Stock markets in transition economies. In: Bokros, Lajos, Fleming, Alexander, Votava, Cari (Eds.), Financial Transition in Europe and Central Asia: Challenges of the New Decade. The World Bank, Washington, DC, pp. 109–138.

Daniel, Kent, Hirshleifer, David, Subrahmanyam, Avanidhar, 1998. Investor psychology and security market under- and overreactions. Journal of Finance 53 (6), 1839–1855.

Daniel, Kent, Titman, Sheridan, 1997. Evidence on the characteristics of cross-sectional variation in stock returns. Journal of Finance 52 (1), 1–33.

Davis, James L., 1994. The cross-section of realized stock returns: The pre-COMPUSTAT evidence. Journal of Finance 49 (5), 1579–1593.

De Bondt, Werner F.M., Thaler, Richard, 1985. Does the stock market overreact? Journal of Finance 40 (3), 793–805.

Dechow, Patricia M., Sloan, Richard G., 1997. Returns to contrarian investment strategies: Tests of naive expectations hypotheses. Journal of Financial Economics 43 (1), 3–27.

Denizer, Cevdet, Gelb, Alan, 1994. Mongolia: Privatization and system transformation in an isolated economy. In: Milor, Vedat (Ed.), Changing Political Economies: Privatization in Post-Communist and Reforming Communist States. Lynne Rienner, Boulder/London, pp. 67–96.

Djankov, Simeon, Murrell, Peter, 2002. Enterprise restructuring in transition: A quantitative survey. Journal of Economic Literature 40 (3), 739–792.

Fama, Eugene F., French, Kenneth R., 1992. The cross-section of expected stock returns. Journal of Finance 47 (2), 427–465.

Fama, Eugene F., French, Kenneth R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33 (1), 3–56.

Fama, Eugene F., French, Kenneth R., 1995. Size and book-to-market factors in earnings and returns. Journal of Finance 50 (1), 131–156.

Fama, Eugene F., French, Kenneth R., 1996. Multifactor explanations of asset pricing anomalies. Journal of Finance 51 (1), 55–84.

Fama, Eugene F., French, Kenneth R., 1998. Value versus growth: The international evidence. Journal of Finance 53 (6), 1975–1999.

Frydman, Roman, Gray, Cheryl, Hessel, Marek, Rapaczynski, Andrzej, 1999. When does privatization work? The impact of private ownership on corporate performance in the transition economies. Quarterly Journal of Economics 114 (4), 1153–1191.

Hahm, Hongjoo, 1993. The Development of the Private Sector in a Small Economy in Transition: the Case of Mongolia. Discussion Paper No. 223 (with Addendum), The World Bank, Washington, DC.

Hanousek, Jan, Filer, Randall K., 2000. The relationship between economic factors and equity markets in Central Europe. Economics of Transition 8 (3), 623–638.

Harris, Lawrence, Hasbrouck, Joel, 1996. Market vs. limit orders: The superDOT evidence on order submission strategy. Journal of Financial and Quantitative Analysis 31 (2), 213–231.

Hingorani, Archana, Lehn, Kenneth, Makhija, Anil K., 1997. Investor behavior in mass privatization: The case of the Czech voucher scheme. Journal of Financial Economics 44 (3), 349–396.

Ikenberry, David, Lakonishok, Josef, Vermaelen, Theo, 1995. Market underreaction to open market share repurchases. Journal of Financial Economics 39 (2–3), 181–208.

Jensen, Gerald R., Johnson, Robert R., Mercer, Jeffrey M., 1998. The inconsistency of small-firm and value stock premiums is not simply a function of time. Journal of Portfolio Management 24 (2), 27–36.

Knez, Peter J., Ready, Mark J., 1997. On the robustness of size and book-to-market in cross-sectional regressions. Journal of Finance 52 (4), 1355–1382.

Korsun, Georges, Murrell, Peter, 1995. The politics and economics of Mongolia's privatization program. Asian Survey 35 (5), 472–486.

Korsun, Georges, Murrell, Peter, 2000. How does the transitional state behave? Evidence from retained state ownership in Mongolian privatization. In: Maskin, Eric, Simonovits, Andras (Eds.), Planning, Shortage, and Transformation. MIT Press, Cambridge, MA, pp. 327–344.

Kothari, S.P., Shanken, Jay, Sloan, Richard G., 1995. Another look at the cross-section of expected stock returns. Journal of Finance 50 (1), 185–224.

Lakonishok, Josef, Shleifer, Andrei, Vishny, Robert W., 1992. The structure and performance of the money management industry. In: Brookings Papers on Economic Activity: Microeconomics, pp. 339–391.

Lakonishok, Josef, Shleifer, Andrei, Vishny, Robert W., 1994. Contrarian investment, extrapolation, and risk. Journal of Finance 49 (5), 1541–1578.

La Porta, Rafael, 1996. Expectations and the cross-section of stock returns. Journal of Finance 51 (5), 1715–1742.

La Porta, Rafael, Lakonishok, Josef, Shleifer, Andrei, Vishny, Robert W., 1997. Good news for value stocks: Further evidence on market efficiency. Journal of Finance 52 (2), 859–874.

Lo, Andrew W., MacKinlay, A. Craig, 1990. Data snooping biases in tests of financial asset pricing models. Review of Financial Studies 3 (3), 431–467.

MacKinlay, A. Craig, 1995. Multifactor models do not explain deviations from the CAPM. Journal of Financial Economics 38 (1), 3–28.

Marcincin, Anton, van Wijnbergen, Sweder, 1997. The impact of Czech privatization methods on enterprise performance incorporating initial selection-bias correction. Economics of Transition 5 (2), 289–304.

Merton, Robert C., 1987. On the current state of the stock market rationality hypothesis. In: Dornbusch, Rudiger, Fischer, Stanley, Bossons, John (Eds.), Macroeconomics and Finance: Essays in Honor of Franco Modigliani. MIT Press, Cambridge, MA, pp. 93–124.

Ochbadrakh, B., 1995. Privatization in Mongolia—1994. In: Böhm, Andreja (Ed.), Privatization in Central & Eastern Europe 1994. In: Central and Eastern Europe Privatization Network Annual Conference Series No. 5. Central and Eastern Europe Privatization Network, Ljubljana, pp. 275–300.

Pistor, Katharina, Turkewitz, Joel, 1996. Coping with hydra—state ownership after privatization: A comparative study of the Czech Republic, Hungary, and Russia. In: Frydman, Roman, Gray, Cheryl W., Rapaczynski, Andrzej (Eds.), Corporate Governance in Central Europe and Russia, Vol. 2. Insiders and the State. Central European University Press, Budapest, pp. 192–244.

Rau, P. Raghavendra, Vermaelen, Theo, 1998. Glamour, value, and the post-acquisition performance of acquiring firms. Journal of Financial Economics 49 (2), 223–253.

Rockinger, Michael, Urga, Giovanni, 2000. The evolution of stock markets in transition economies. Journal of Comparative Economics 28 (3), 456–472.

Rouwenhorst, K. Geert, 1999. Local return factors and turnover in emerging stock markets. Journal of Finance 54 (4), 1439–1464.

Rozeff, Michael S., Zaman, Mir A., 1998. Overreaction and insider trading: Evidence from growth and value portfolios. Journal of Finance 53 (2), 701–716.

Shafik, Nemat, 1995. Making a market: Mass privatization in the Czech and Slovak Republics. World Development 23 (7), 1143–1156.

State Statistical Office of Mongolia, 1997. Monthly Statistical Bulletin 1997-1. State Statistical Office, Ulaanbaatar.