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Public Offerings of State-Owned And Privately-Owned Enterprises: An International Comparison

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ABSTRACT

We compare initial offer prices in privatizations to initial prices in public offerings of private companies. The evidence indicates that government officials in the United Kingdom underprice IPOs significantly more than their private company counterparts. In Canada and Malaysia, however, the opposite is true. There does not appear to be a *general* tendency for privatizations to be underpriced to a greater degree than private company IPOs. We provide additional evidence on the determinants of privatization initial returns. Our findings indicate that initial returns are significantly higher in relatively primitive capital markets and for privatized companies in regulated industries.

THIS ARTICLE EXAMINES PRIVATIZATION of state-owned enterprises through public offerings of common stock. We take a global perspective and discuss privatization events in Canada, France, Hungary, Japan, Malaysia, Poland, Thailand, and the United Kingdom (U.K.). The focus is on the pricing of initial public offerings (IPOs) of state-owned companies and the initial returns to investors who participate in these offerings.

There is abundant evidence that initial public offerings of *privately-owned* companies tend to be underpriced. Ibbotson (1975), Ibbotson, Sindelar, and Ritter (1988), Logue (1973), McDonald and Fisher (1972), and Ritter (1984, 1991) study IPOs in the United States. All conclude that, on average, initial offer prices are significantly less than early after-market prices. Moreover, IPO underpricing is not peculiar to the United States. Loughran, Ritter and Rydqvist (1994) review more than 30 studies of IPOs in 25 countries (including the United States). In every case, the evidence indicates that IPOs are under-

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priced, on average, providing large initial returns to investors who are able to buy shares at the offer price.

The evidence on initial public offerings of state-owned companies, although less extensive, is consistent with that on privately-owned companies. Vickers and Yarrow (1988) and Jacquillat (1987) report on privatizations in the U.K. and France, respectively. Jenkinson and Mayer (1988) analyze privatizations in both of these countries. Perotti and Guney (1993) provide relevant evidence on offer pricing for privatizations in Malaysia, Spain, and Turkey, as well as France and the United Kingdom. Jones, Megginson, Nash, and Netter (1996) treat a sample of privatizations in many different nations. Uniformly, the evidence presented in these studies indicates that IPOs of state-owned companies, like those of privately-owned companies, tend to be underpriced.

Despite the voluminous literature on IPOs, work explicitly comparing offers of state-owned companies, privatization IPOs, to those of privately-owned companies is scarce. Vickers and Yarrow (1988), Jenkinson and Mayer (1988), Jacquillat (1987), and Perotti and Guney (1993) all suggest that underpricing is greater for IPOs of state-owned than for privately-owned firms. This conclusion seems to derive from casual observation and is not well-supported by references to specific empirical results and formal inference. Levis (1993) explicitly compares average initial returns for privatization IPOs to those for IPOs of privately-owned firms.¹ His sample, however, is restricted to IPOs in the United Kingdom. Furthermore, the focus of his study is on long-run IPO performance. Levis does not formally test for differences between the mean initial returns to investors in IPOs of state-owned companies and the mean initial returns to investors in IPOs of privately-owned companies.

There is also a large literature on privatization, *per se*. Few attempts have been made, however, to rigorously test hypotheses on the cross-sectional determinants of initial returns for privatization IPOs. To our knowledge, only Jones *et al.* (1996), who discuss the relations between initial returns, underwriting fees, and other factors, present evidence of this type.

In this article, we provide an analysis of initial offer prices in privatizations of state-owned companies compared to initial prices in public offerings of private companies. This comparison provides direct evidence on the conjecture noted above that privatization IPOs are, in general, underpriced more than privately-owned company IPOs. It also helps to identify similarities and differences between the two types of transactions.

In addition to comparing privatizations to private company IPOs, we analyze the cross-sectional determinants of privatization initial returns. Several hypotheses about these determinants are suggested by offer pricing models stressing informational asymmetry. Other hypotheses are suggested by the political dynamics of privatizations. These hypotheses are investigated within multivariate regression models. The evidence provides some support for both types of hypotheses and the models explain a surprisingly large fraction of initial return variance, up to 49 percent!

¹ See Levis (1993) p. 39, Exhibit 11.

The remainder of the article is organized as follows. Section I briefly describes some institutional features of privatizations in general. In section II we discuss the theory underlying our hypotheses about privatization offer prices. Section III discusses our data, empirical methods, and tests. Section IV concludes the article.

I. The Privatization Process

The term privatization refers to procedures through which a government transfers ownership of assets and control of commercial activities to the private sector. Privatization includes three types of procedures: outright sale of companies or assets, deregulation, and contracting out of services to private providers. The sale of government owned companies is carried out by three methods: fixed-price share sales, tender, and private placement. Private placement occurs when the government sells its assets to a private company or group of companies. Tender occurs when investors bid for shares of a state-owned enterprise, specifying both a price per share and quantity of shares that they are willing to buy. In fixed-price share sales, the government sets an offering price for shares and investors submit applications for the number of shares they wish to purchase. This article focuses on this last type of privatization, fixed-price share sales, in Canada, France, Hungary, Japan, Malaysia, Poland, Thailand, and the United Kingdom.

Governments have wide latitude along several dimensions in the design of these sales. For example, all shares of a company may be sold at once or in tranches separated by months or years. Shares may be reserved for employees, managers, institutions, or foreign investors, or limits may be placed on the holdings of some category of investor. Shares may be sold at discounts or with concessionary financing to particular investor groups. Oversubscribed issues may be allocated pro rata or by more complicated schemes. Government may retain a golden share giving it partial control over some firm decisions or create regulatory bodies through which it exercises further influence.

Each country employs a fairly consistent approach to its privatization transactions, although there are differences between countries. In most cases, the stated goals of privatization include fostering the development of capital market institutions or broadening share ownership, improving the economic performance of privatized enterprises, and raising revenue. The pace, scope, and structure of privatization programs indicate, however, that governments place different weights on these various goals. The relative importance of each goal appears to be determined by the country's unique historical, cultural, and fiscal situation. Space limitations preclude a full treatment of the historical backgrounds, and the similarities and differences among privatization programs here. In an Appendix, we describe the history and key features of the privatization programs in the eight countries included in this study. Details about the specific privatization transactions analyzed here, including company names, offer dates, and offer size, are reported in another Appendix. Both of these appendices are available from the authors on request, or may be obtained

from The Journal of Finance Web site at URL <http://www.cob.ohio-state.edu/fin/journal/supplements/supplement.htm>.

II. Theory of Initial Offer Prices

There are several models of IPOs that seek to explain the well-known tendency for offers to be underpriced. In most of these models underpricing is a consequence of assumed informational asymmetries where one type of agent has better information than others about the value of the offer. In Baron (1982), informed investment bankers confront uninformed issuers. New issues may be underpriced to induce investment bankers to supply the optimal distribution effort. Rock (1986), Beatty and Ritter (1986), and Chowdhry and Sherman (1994) postulate that there are two differentially informed classes of investors. The better informed class avoids overpriced IPOs. As a consequence, investors with inferior information receive larger allocations of overpriced than of underpriced offers. Given this winner's curse phenomenon, IPOs must be underpriced on average to attract the participation of uninformed investors. Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989) all assume that issuers possess better information than investors about the value of the offer. In these models, IPO underpricing signals that the firm is a high value type. High value type issuers optimally signal because this enables them to charge higher prices in subsequent stock offers, or to enjoy higher value for the equity that they retain.

Perotti (1995) treats privatization offers explicitly within an asymmetric information framework. His model is similar to those of Allen and Faulhaber (1989), Grinblatt and Huang (1989), and Welch (1989) in that the issuing government is presumed to have more complete information than investors. A distinguishing feature of this model is that the issuer can affect firm value after the initial offer. Government may use its policy instruments, such as rate and entry regulation or taxation, to transfer value from shareholders to other groups. Governments committed to privatization do not make such transfers, but other governments do. Governments signal commitment in this model by their retained equity share, and by underpricing.

The asymmetric information theories generally imply that IPO underpricing is an increasing function of uncertainty regarding the value of the offer. This in turn implies that offers of small, young firms in new, technologically dynamic industries should be underpriced more and yield greater initial returns than offers of large, established firms in stable industries. Private company IPOs often involve young firms in relatively new industries but state-owned companies that are privatized typically are old, large and well-known. For this reason, the extent of informational asymmetry and its impact on offer pricing should be greater for private company IPOs than for privatizations. Under the asymmetric information theories, then, it follows that initial returns to investors in privatization IPOs would tend to be less than initial returns in IPOs of privately-owned companies.

In Baron (1982) and Chowdhry and Sherman (1994), issuers explicitly maximize the net proceeds of their IPOs. Allen and Faulhaber (1989) and Welch (1989) assume issuers maximize the present value of expected proceeds of the IPO plus those of a subsequent seasoned equity offering (SEO). Similarly, in Rock (1986), Beatty and Ritter (1986), and Grinblatt and Hwang (1989), the issuer maximizes expected utility of postoffer wealth, which is comprised of net offer proceeds plus the value of retained equity. This type of proceeds, or value, oriented objective function for issuers underlies Perotti's privatization model, as well. In Perotti's model, however, the low-type government issuer derives benefit from subsequent transfers of firm value from its shareholders. The high-type (committed) government issuer eschews such transfers and maximizes the sum of IPO proceeds, profit on retained share, and subsequent SEO proceeds.

For government issuers, maximizing privatization proceeds may be part of a strategy for attaining some specific fiscal objective. For example, Western European nations face constraints on aggregate public sector debt under the Maastricht Treaty. Privatization proceeds can be applied to reduce public debt and alleviate these constraints.

Government officials, however, may not seek to maximize proceeds but to pursue other political and economic objectives in privatization IPOs. Officials could underprice shares to build domestic political support for an overall *program* of privatization. Underpricing can serve also to promote widespread direct shareholding among a nation's citizens and, in this way, foster the development of liquid domestic capital markets. In addition, allocation rules can be used to direct underpriced shares to firm employees, who might otherwise impede privatization transactions. Without employee acquiescence, privatization may be politically infeasible. Finally, in some instances, government officials may seek to benefit indirectly by underpricing shares and allocating them to political allies. All of these political objectives suggest that government officials have stronger incentives than private issuers to underprice IPOs and that they do so to a greater degree. If so, initial returns to investors in privatizations should tend to *exceed* those to investors in private company IPOs.

Capital markets in Hungary, Malaysia, Poland, and Thailand are much less well-developed than those in Canada, France, Japan, and the United Kingdom. Presumably, governments in countries with relatively primitive capital markets are those most likely to promote broader share ownership by deeply discounting privatization shares in IPOs. In addition, there is probably greater uncertainty about the intrinsic value of initial share offers in primitive capital markets than in developed ones. In primitive capital markets there are few, if any, existing publicly-traded firms that are closely comparable to an offering firm. There are also fewer security analysts specializing in primitive capital markets. Thus, the appraisal of offering firms is more difficult and the production and dissemination of information pertaining to share values is less extensive under primitive capital market conditions. Greater uncertainty about the value of an offer prevails under these conditions. Therefore, differ-

ences in valuation uncertainty and in government political objectives suggest that initial returns for privatizations in countries with relatively primitive capital markets should exceed those for privatizations in countries with highly developed capital markets, other factors held constant.

Privatized firms are often in industries that are subject to extensive government regulation, regardless of ownership structure. For example, banks, telephone companies, and water, gas, and electric utilities typically operate under elaborate government controls on their activities and product prices. Governments privatizing these industries retain influence over firms in them through newly created or substantially restructured regulatory bodies. When privatization offers occur, much uncertainty often remains regarding the nature and implementation of applicable regulations. For example, Japanese officials delayed a decision on whether or not to break up NTT into separate operating companies until after the public offering.

Uncertainty regarding the character of regulatory policy contributes to uncertainty about the intrinsic value of privatization IPOs of regulated firms. Moreover, as Perotti (1995) notes, firms in regulated industries often possess some market power and the potential to earn monopoly rents. Because these rents are especially liable to appropriation by government, such firms are subject to a high degree of policy risk. Therefore, asymmetric information theories in general, and Perotti's model in particular, predict higher initial returns for privatization offers of firms in extensively regulated industries than for offers of less regulated firms.

III. Data, Empirical Methods and Tests

Our empirical tests relate to privatizations in eight different countries. We select countries based on numbers of fixed-price privatization IPOs and on the availability of information. For the developed country sample, we focus on the largest capital markets. Our developed country sample comprises four of the seven countries with the greatest total stock market capitalizations in the world, as measured in 1985. For the primitive market sample, we focus on the emerging market countries for which we could gather data on the largest number of transactions.

We obtain our data on privatizations from single-country studies of privatization efforts (Vickers and Yarrow (1988) on the U.K., Fukui (1992) and Takano (1992) on Japan, Stanbury (1989) on Canada, Jacquillat (1987) on France, Meth-Cohn (1990) and Nuti (1992) on Hungary, and Gomulka (1992) on Poland), from earlier articles presenting international comparisons (Perotti and Gunev (1993), Nankani (1988), Jenkinson and Mayer (1988), and Jones *et al.* (1996)), and from an extensive NEXIS search of the press. From these sources, we gather detailed information on privatizations through public share offers: company names, ownership share divested, share allocation methods, offer prices, and transaction dates. For those transactions representing IPOs, we collect daily stock price data and relevant country stock market indices from Datastream International. Unless otherwise stated, we use the

Datastream Total Market index for each country. This is a value-weighted price index of all the shares represented in the Datastream data base. Datastream estimates their data base covers approximately 90 percent of total value in each of these markets. For Poland and Hungary, we use Morgan Stanley's Europe (Free, excluding United Kingdom) local index. Daily stock price and market index data are available for 109 privatization IPOs: 13 in Canada, 10 in France, 10 in Hungary, 3 in Japan, 12 in Malaysia, 19 in Poland, 4 in Thailand, and 38 in the United Kingdom.

We calculate privatization returns over one-day, seven-day, and thirty-day holding periods following the offer date. These are calendar day intervals, not trading days. For brevity, we focus here mainly on the results of our tests using one-day returns. Results for the other holding periods are similar. Both raw returns and market-adjusted returns are considered. Specifically, returns are calculated as follows:

$$\begin{aligned}
 P_{it} &= \text{closing stock price of company } i \text{ on day } t \text{ following initial trade } (t = 1, 7, 30) \\
 P_{io} &= \text{initial offer price for company } i \\
 r_{ic} &= \frac{\log(P_{it}) - \log(P_{io})}{c^2} = \text{raw, unadjusted return to company } i \text{ in country } c^2 \\
 I_{ct} &= \text{stock market index level for country } c \text{ on day } t \\
 I_{co} &= \text{stock market index level for country } c \text{ on the date the offer price is set} \\
 r_{ic}^* &= r_{ic} - [\log(I_{ct}) - \log(I_{co})] = \text{market-adjusted return to company } i \text{ in country } c^2
 \end{aligned}$$

Table I reports summary statistics on the raw and market-adjusted returns for the 109 IPOs of state-owned companies in our sample. Malaysia, Poland, and Thailand have the highest and Canada the lowest average returns, on both an adjusted and unadjusted basis. Average unadjusted one-day returns are 2.5 percent for Canada, 11.4 percent for France, 14.9 percent for Hungary, 16.0 percent for Japan, 52.2 percent for Malaysia, 50 percent for Poland, 46.6 percent for Thailand, and 18 percent for the United Kingdom. The average market-adjusted one-day returns are also all positive, ranging from 0.3 percent for Canada to 53.7 percent for Malaysia. Most of the average returns reported in Table I are greater than zero at the 0.01 or, at least, the 0.05 significance level. For the full sample, the average initial return is significantly greater than zero at the 0.01 level for every holding period considered on both an adjusted and unadjusted basis. The medians reveal no predominant tendency of right or left skewness in the cross-sectional returns distributions. The Polish return medians are well below the Polish averages, but the French and Japanese medians are larger than their corresponding averages. These results confirm and extend findings reported in earlier research that IPOs of state-

² These are daily returns expressed as continuously compounded rates. Our results are unchanged when we use the discrete daily rates themselves.

Table I
Initial Returns for Privatizations

Average and median unadjusted and market adjusted initial returns for initial share offers in privatizations of state-owned enterprises. Returns are measured over intervals of 1, 7, and 30 calendar days following initial trading of the shares. The unadjusted return equals $(\log(\text{stock closing price}) - \log(\text{stock offer price}))$. The market adjusted return equals $(\text{unadjusted return} - (\log(\text{market index at closing date}) - \log(\text{market index at pricing date})))$. *a*, *b*, *c* denote significance at the 0.10, 0.05 and 0.01 levels respectively for one-tailed tests. The market index data are from Datastream International. Additional data are taken from Stanbury (1989), Perotti and Gunev (1993), Vickers and Yarrow (1988), Takano (1992), Fukui (1992), and the public press.

	Average, Median (<i>t</i> -Statistic, Sample Size)					
	Unadjusted Returns (%)			Market Adjusted Returns (%)		
	1 Day	7 Days	30 Days	1 Day	7 Days	30 Days
Canada	2.5, 1.6 (0.99, 13)	1.9, 0.0 (0.53, 13)	0.7, 3.1 (0.10, 13)	0.3, -1.2 (0.08, 13)	-0.2, -3.8 (-0.04, 13)	-2.1, 8.4 (-0.29, 13)
France	11.4, 13.5 (2.80 ^b , 10)	11.3, 13.1 (3.12 ^c , 8)	12.5, 14.8 (2.41 ^b , 8)	15.0, 14.8 (6.41 ^c , 10)	15.5, 16.1 (5.84 ^c , 8)	17.6, 17.3 (4.40 ^c , 8)
Hungary	14.9, 7.4 (2.33 ^b , 10)	12.2, 8.3 (1.95 ^b , 7)	5.1, 7.1 (2.71 ^b , 7)	14.1, 6.3 (2.63 ^b , 10)	10.1, 6.6 (2.04 ^b , 7)	2.4, -5.3 (0.41, 7)
Japan	16.0, 29.0 (0.73, 3)	12.1, 26.4 (0.59, 3)	20.0, 11.0 (0.53, 3)	14.8, 18.7 (0.73, 3)	10.6, 26.1 (0.61, 3)	19.3, 25.6 (0.71, 3)
Malaysia	52.2, 54.6 (8.39 ^c , 12)	50.2, 54.9 (6.92 ^c , 11)	50.3, 48.9 (8.16 ^c , 11)	53.7, 47.6 (7.82 ^c , 12)	51.3, 42.8 (6.80 ^c , 11)	50.5, 39.8 (6.98 ^c , 11)
Poland	50.0, 25.4 (2.95 ^c , 19)	52.7, 27.1 (3.03 ^c , 19)	48.8, 25.1 (2.63 ^c , 19)	44.4, 20.4 (2.65 ^c , 19)	46.7, 24.7 (2.74 ^c , 19)	42.9, 19.6 (2.37 ^b , 19)
Thailand	46.6, 40.6 (2.35 ^b , 4)	40.8, 44.4 (2.15 ^a , 4)	60.3, 73.3 (2.26 ^a , 4)	51.9, 41.1 (2.51 ^b , 4)	46.7, 41.8 (2.42 ^b , 4)	59.4, 63.2 (2.46 ^b , 4)
U.K.	18.0, 18.3 (17.00 ^c , 38)	17.0, 18.2 (8.04 ^c , 38)	18.8, 18.1 (14.61 ^c , 38)	14.3, 13.8 (12.41 ^c , 38)	13.6, 14.5 (6.71 ^c , 38)	14.5, 14.7 (11.06 ^c , 38)
Full sample	25.6, 17.4 (7.11 ^c , 109)	25.2, 18.2 (6.43 ^c , 103)	25.7, 18.2 (6.10 ^c , 103)	23.7, 14.4 (6.62 ^c , 109)	23.1, 15.5 (5.99 ^c , 103)	22.8, 15.9 (5.54 ^c , 103)

owned companies tend to be underpriced, though average initial returns for the Canadian privatizations are small.

We compare initial returns to investors in privatizations and in IPOs of privately-owned companies. Information on IPOs of privately-owned companies in Canada, France, Japan, Malaysia, Thailand, and the United Kingdom was taken from Loughran, Ritter, and Rydqvist (1994) who review and summarize recent, international empirical research on IPOs. Loughran *et al.* do not report on IPOs in Hungary or Poland. We were able to identify a small sample of private company IPOs in Hungary, but none in Poland. For this reason, we do not include Poland in our comparisons of privatization initial returns to private company IPO initial returns. The average initial return for five private company IPOs in Hungary is 14.9 percent. Details on the private IPO samples are given in Table II.

Table II
Test of Difference in Mean Initial Returns for Privatizations of
State-Owned Enterprises Versus Private Company Initial Public
Offerings

The table reports the average difference between initial privatization returns and average initial returns in initial public offerings (IPOs) of privately-owned companies for seven countries separately and for the seven jointly. Initial returns are calculated by subtracting the log of the offer price from the log of the closing price on the first day of trading. The Student's t -statistic represents a test of the null hypothesis that the true difference of means is zero. The test statistic is distributed as Student's t with degrees of freedom equal to the sample size minus one. For the full sample, under the same null hypothesis, the test statistic is approximately a standard normal random variable. The T^+ test statistic equals the number of cases where the initial privatization return exceeds the mean private IPO return for that country. Under the null of no difference, T^+ is distributed as a binomial distribution, $b(n, 0.5)$. a, b, c denote significance at the 0.10, 0.05, and 0.01 levels respectively for two-tailed tests. The source of private company IPO data is Loughran *et al.* (1994, Table 2), Jog and Riding (1987), and the authors' sample for Hungarian private IPOs.

Country	Private Company IPOs		Privatizations		Comparison		
	Sample Size	Average One-day Return	Sample Size	Average One-day Return	Average Difference in Returns	Student's t	T^+
Canada	100	9.3%	13	2.5%	-6.85%	-2.73 ^b	3 ^a
France	187	4.2	10	11.4	7.20	1.77	9 ^c
Hungary	5	14.9	10	14.9	0.04	-0.01	2
Japan	472	32.5	3	16.0	-16.53	-0.75	1
Malaysia	132	80.3	12	52.2	-28.08	-4.50 ^c	1 ^c
Thailand	32	58.1	4	46.6	-11.50	-0.58	1
United Kingdom	2,133	12.0	38	18.0	6.03	5.67 ^c	33 ^c
Full sample			90	25.6	-2.44	-1.41	50

We assume that IPO returns for a given country are independently, identically, and normally distributed. The means and variances of initial return distributions are allowed to differ across countries. We also assume that the average one-day returns reported in Loughran *et al.* for IPOs of privately-owned companies equal true population mean returns for the respective countries. Obviously, we are ignoring the measurement errors of the averages, but these (except for Hungary) are probably negligible given the large sample sizes from which the averages are computed.

Formally, we test the hypothesis that the mean initial return in IPOs of state-owned companies equals the mean initial return in IPOs of privately-owned companies. We conduct this test for Canada, France, Hungary, Japan, Malaysia, Thailand, and the United Kingdom separately, and for these seven countries jointly. The country-specific test statistic is given by:

$$T_c = \frac{\sum_i (r_{ic} - \bar{r}_c)}{\sqrt{N_c \hat{\sigma}_c^2}} \quad (1)$$

where:

- $\bar{r}_c$ = the average private company IPO return for country c
- N_c = the number of state-owned company public offerings for country c
- $\hat{\sigma}_c^2$ = sample variance of $(r_{ic} - \bar{r}_c)$

Under the assumptions stated above, T_c has the Student's t -distribution with $N_c - 1$ degrees of freedom. The statistic for the joint test across the whole sample is:

$$T = \frac{\sum_c \sum_i (r_{ic} - \bar{r}_c)}{\sqrt{\sum_c (N_c \hat{\sigma}_c^2)}} \quad (2)$$

which is asymptotically normally distributed with mean zero and unit variance under the null hypothesis.

Table II reports the results of the hypothesis tests. The T statistic for the joint test equals -1.41 . This does not differ significantly from zero at conventional levels of statistical confidence.³ Test statistics for France, Hungary, Japan, and Thailand are also statistically insignificant. The test for the United Kingdom *does* indicate greater initial returns in privatizations. The relevant test statistic equals 5.67 ($df = 37$) and is significant at the 0.01 level. The tests for Canada and Malaysia, however, indicate that privatizations in those countries yield *lower* initial returns. For Canada, the test statistic equals -2.73 ($df = 12$). This is significantly different than zero at the 0.05 level. For Malaysia, the test statistic equals -4.50 ($df = 11$) and is significant at the 0.01 level.

We also conducted a binomial sign test. The T^+ statistic in Table II equals the number of privatization offers in a given country for which the one day return exceeds the mean one day return for private company IPOs in that country. Under the hypothesis that privatization returns are as likely to be less than private company IPO returns as to exceed them, T^+ is distributed binomially with probability parameter $p = 0.5$. Based on the T^+ statistic, we reject this hypothesis at the 1 percent significance level for France, Malaysia, and the United Kingdom, and at the 10 percent level for Canada. We do not reject the hypothesis, however, for the full sample. The results in Table II provide little support for the simple notion that all governments tend to underprice initial offers to a greater degree than do private company issuers.

Chowdhry and Sherman (1994) argue that IPO initial returns may be positively related to the length of time between setting the offer price and the offer date. Beatty and Ritter (1986) and Mauer and Senbet (1992) present evidence that initial returns are negatively related to offering size. It is possible that privatizations differ systematically from private company IPOs in the time between price setting and offer date or in offering size. If so, the univariate tests reported in Table II may yield misleading results.

³ The full sample test was performed also assuming equal variances across the countries, with a single pooled variance estimator. The resulting test statistic value was -1.20 , which does not differ significantly from zero.

Table III
Regressions for IPO Mean-Adjusted Privatization Initial Returns
(Canada, France, Japan, and the U.K. only)

Initial returns for privatizations in each country are adjusted by subtracting the average private company IPO initial return for the country reported in Loughran *et al.* (1994, Table 2). Initial returns are calculated by subtracting the log of the offer price from the log of the closing price on the first day of trading. Explanatory variables measuring the total (U.S. dollar) value of the privatization offer (ADJVAL) and the number of days between price setting and first trade date (ADJDAYS) are adjusted by subtracting corresponding private company IPO means for these variables reported in Loughran *et al.* (1994, Table 2) and Jog and Riding (1987). Loughran *et al.* report only the median value of French private company IPOs, so the median is used in the adjustments here. Dummy variables indicate the country where the privatization offer occurred. Coefficients are estimated by ordinary least squares regression. The *t*-statistics, based on the ordinary least squares standard errors, are given in parentheses (top) and on bootstrapped standard errors in brackets [bottom]. a, b, c denote significance at the 0.10, 0.05, and 0.01 levels, respectively, for two-tailed tests.

Regressor	Coefficient Estimates	
Constant	0.065 (3.338 ^c) [2.446 ^b]	
Canada		-0.064 (-1.670 ^a) [-1.159]
France		0.098 (2.441 ^b) [1.552]
Japan		0.012 (0.124) [0.072]
U.K.		0.084 (4.167 ^c) [2.961 ^c]
ADJDAYS	-1.125 × 10 ⁻³ (-2.153 ^b) [-1.209]	-2.358 × 10 ⁻⁴ (-0.424) [-0.195]
ADJVAL	-5.536 × 10 ⁻⁶ (-1.172) [-0.749]	-7.509 × 10 ⁻⁶ (-1.273) [-0.774]
Adjusted R ²	0.061	0.231
N	63	63

Table III reports results of regressions that control for time between price setting and offer date, and for offering size. Initial returns for privatizations in each country are adjusted by subtracting the average private company IPO return for the country reported in Loughran *et al.* (1994, Table 2). For each privatization, the number of days between price setting and first trade date and the total value of the offer are adjusted similarly by subtracting corresponding private company IPO means for these variables reported in Lough-

ran *et al.* (1994, Table 2) and in Jog and Riding (1987).⁴ The adjusted initial returns are regressed on the adjusted number of days between price setting and first trade date and the adjusted offer value. Unfortunately, we lack data required to adjust the regressors for privatizations in Hungary, Malaysia, Poland, and Thailand. For this reason, the regression results in Table III pertain to the developed countries, Canada, France, Japan, and the United Kingdom only.

In Table III, the regression intercepts measure the mean differences between privatization initial returns and private company IPO initial returns, after controlling for differences in the time between price setting and first trade date, and for differences in offering size. One regression constrains the intercepts to be equal across the four developed countries. In this regression the estimated intercept is 0.065, indicating that privatization initial returns exceed private company IPO initial returns by 6.5 percent, on average, after controlling for the time between price setting and first trade date and for offering size.

We assess the significance of the regression coefficients using *t*-statistics computed with ordinary parametric estimates of coefficient standard errors and also with bootstrapped standard errors.⁵ Specification tests reject residual normality for our cross-sectional regressions, so the parametric *t*-statistics are probably less reliable than the bootstrap versions. The estimated intercept differs significantly from zero at the 0.01 level using the parametric *t*-statistic and at the 0.10 level using the bootstrap *t*-statistic. Both results tend to support the hypothesis that governments underprice initial offers more than private issuers.

The other regression reported in Table III permits intercepts to vary by country. This regression reveals wide variation across countries in the structure of privatization initial returns. France, Japan, and the United Kingdom have positive intercepts, but Canada has a negative intercept. Using the bootstrap *t*-statistic, only the United Kingdom intercept appears to be significant. Using the parametric *t*-statistic, however, the intercepts for France, the United Kingdom, and Canada all differ significantly from zero. Moreover, *F*-tests using both classical and bootstrap methods reject the hypothesis that the true intercepts are equal across the countries at the 0.01 level. Hence, the regression analysis reported in Table III helps to reinforce the impressions gained from Table II. In some countries privatizations tend to be underpriced more than private company IPOs, but in other countries the opposite is true.

⁴ Loughran *et al.* do not report the mean offer value for Canadian IPOs. The source cited for Canadian data in their Table 2, however, is Jog and Riding. Jog and Riding do report the mean offer value for their sample of Canadian IPOs. This is the value we use in our work. Also, Loughran *et al.* report only the median value of French private company IPOs, so the median is used in the adjustments here. Finally, Loughran *et al.* report "... the typical time period from the setting of the offer price to the issue date." This may not correspond precisely in all cases to the time between price setting and first trade date.

⁵ These estimates are based on 500 bootstrap replications with random sampling from the ordinary least squares residual vector. See Efron and Tibshirani (1993), chapter 9.

We test also the hypothesis that mean initial privatization returns in countries with developed capital markets are equal to those in countries with primitive capital markets. The average one-day (unadjusted) return for 64 privatizations in Canada, France, Japan, and the United Kingdom is 13.7 percent. The average for 45 privatizations in Hungary, Malaysia, Poland, and Thailand is 42.5 percent. A test for the difference of the two means rejects equality at the 0.01 level. This evidence supports the hypothesis that greater uncertainty about the value of offers in primitive capital markets induces greater underpricing, a prediction of the asymmetric information theories. The evidence, however, is also consistent with the idea that where capital markets are relatively primitive, governments seek to promote widespread share ownership by marked underpricing of privatization offers.

Another test we conduct measures the relation between government regulation and returns. We find that the average initial privatization return for firms in extensively regulated industries differs from that for firms in comparatively unregulated industries, but the difference is small. We define regulated industries as banking, transportation, and utilities. Unregulated industries include manufacturing of producer or consumer goods, services, retail trade, and natural resources. The average initial return for 55 privatizations in regulated industries is 26.6 percent. The average for 54 privatizations in unregulated industries is 24.6 percent. In this case, the difference is statistically insignificant ($t = 0.276$).

Typically, in privatizations some shares are set aside for purchase by firm employees. Where shares are greatly underpriced, allocation preferences could be used to enlist employee political support for the privatization. This suggests that initial returns in privatizations where a share tranche is reserved for employees should exceed initial returns where there is no such reserved tranche. Our results bear out this prediction. We find that the average initial return for 90 privatizations with an employee share allocation equals 28.2 percent and that the average initial return for 13 privatizations without an employee share allocation equals 6.7 percent. The difference between average returns in the two groups is statistically significant at the 0.01 level.

Foreign investors are allowed to purchase shares in most, but not all, privatizations. It is plausible that when governments choose to deeply discount privatization shares for domestic political reasons, they also seek to bar foreigners from taking up any part of the offer. Otherwise, the offer would transfer wealth to foreigners. This line of reasoning predicts relatively high initial returns in offers barring foreign participation. The evidence is consistent with this prediction. The average initial return for 15 privatizations without foreign share tranches is 31.2 percent. This exceeds the average for 84 privatizations with foreign tranches, which equals 25.8 percent. Moreover, the difference between the two averages is significant at the 0.10 level.

Cross-sectional regression provides an alternative, multivariate framework for investigating the determinants of initial privatization returns. The regression framework permits us to further refine our tests by controlling for several factors that may influence returns in conjunction with employee and foreign

participation, capital market development, and firm regulatory status. We regress initial privatization returns on control variables and on variables measuring employee and foreign participation. Separate regressions use different measures of participation. One set of regressions measures employee participation as the fraction of firm equity reserved for employees and foreign participation as the maximum fraction made available to foreign investors. Another set uses dummy variables. The dummy variable for employee participation equals one if any shares were explicitly reserved for employees and zero otherwise. The dummy variable for foreign participation equals one if foreigners were permitted to buy any shares and zero if they were excluded from the offer entirely. Dummy variables that distinguish developed from primitive capital markets and regulated from unregulated firms are also used in the regressions.

As we noted earlier, Chowdhry and Sherman (1994) contend that IPO initial returns should be an increasing function of the time between price setting and offer date, and Beatty and Ritter (1986) and Mauer and Senbet (1992) present evidence that IPO initial returns are a decreasing function of offer value. For this reason, we include the number of days between price setting and first trade date, and the value of the offer divided by the country's GDP among the regressors.⁶ We include also the fraction of equity retained by the government-issuer and the order of the offer within the country's privatization program.

In Perotti's (1995) model, governments signal commitment to privatization through retained equity fraction and underpricing. Underpricing only occurs when the optimal retained share is high. Therefore underpricing tends to be positively related to retained share. This result is similar to that obtained by Grinblatt and Huang (1989) for private company IPOs.

The order of the offer may affect returns for two reasons. First, there is greater uncertainty about the first few privatizations in a country than about subsequent privatizations. This is because investors accumulate relevant knowledge as the scope and implications of the privatization program gradually are revealed. Under the asymmetric information theories, the accumulation of such knowledge and consequent reduction of uncertainty about offer characteristics would diminish initial returns over time. Second, government officials may try to solidify political support during the early stages of a privatization program by creating a cadre of satisfied investors who have benefited from the program. Such a cadre can be created by substantially underpricing the first few privatization offers. This twist on the political objectives hypothesis, therefore, also predicts that initial returns for the first few, low order, privatizations should exceed those for later, higher order offers.

The results of several regressions are reported in Table IV. Perhaps the most striking figures in Table IV are the adjusted R^2 s. These range between 21.5 percent and 49.4 percent. This is much higher than those typically obtained in

⁶ We conducted our tests using the offer value, without dividing by GDP, as the regressor, as well. Our results were not materially affected.

Table IV
Regressions for Privatization Initial Returns

Market-adjusted one-day initial returns for privatizations are regressed on the number of days between price setting and first trade date (DAYS), fraction of equity retained by the government (GOVT), value of the offer divided by country gross domestic product (VAL/GDP), employee (EMPLOYEE) and foreign (FOREIGN) participation, and dummy variables distinguishing capital market development (PRIMITIVE) and firm regulatory status (REGULATED), and on a variable indicating the order of the offer within the country's privatization program (ORDER). PRIMITIVE equals one for privatizations in primitive capital markets and zero otherwise. REGULATED equals one for privatizations of firms in regulated industries and zero otherwise. The variable ORDER equals one for the first fixed-price share sale privatization offer within a country, two for the second offer, and so forth. Coefficients are estimated by ordinary least squares regression. The *t*-statistics, based on the ordinary least squares standard errors, are given in parentheses (top) and on bootstrapped standard errors in brackets [bottom]. a, b, c denote significance at the 0.10, 0.05 and 0.01 levels, respectively, for two-tailed tests.

Regressor	Coefficients			
Constant	-0.059 (-0.888) [-0.922]	-0.213 (-2.268 ^b) [-2.194 ^b]	-0.282 (-1.762 ^a) [-1.665 ^a]	0.073 (0.584) [0.389]
Days		0.001 (0.911) [0.887]	0.001 (1.019) [0.967]	-0.001 (-0.664) [-0.384]
GOVT		0.001 (1.172) [1.182]	0.002 (1.213) [1.185]	-0.001 (-0.323) [-0.216]
VAL/GDP		-5.613 (-0.582) [-0.644]	-4.718 (-0.447) [-0.432]	-0.468 (-0.083) [-0.051]
Order		0.020 (2.517 ^b) [2.610 ^b]	0.025 (2.855 ^c) [2.704 ^c]	0.008 (1.272) [0.958]
Employee Yes, No (1, 0)			0.103 (0.835) [0.811]	
Share of Co. (%)				1.540 (1.723 ^a) [1.222]
Foreign Yes, No (1, 0)			-0.106 (-0.927) [-0.866]	
Share of Co. (%)				-0.597 (-1.730 ^a) [-1.233]
Primitive	0.419 (5.591 ^c) [5.525 ^c]	0.350 (3.779 ^c) [3.751 ^c]	0.360 (3.423 ^c) [3.291 ^c]	0.426 (4.515 ^c) [2.982 ^c]
Regulated	0.245 (3.315 ^c) [3.371 ^c]	0.178 (2.129 ^b) [2.489 ^b]	0.169 (1.778 ^a) [1.659]	0.035 (0.615) [0.456]
Adjusted R ²	0.215	0.234	0.248	0.494
N	109	108	95	61

similar attempts to explain cross-sectional variation in private company IPO returns.

Despite the overall significance of the regressions reported in Table IV, we find no evidence that the length of time between price setting and first trade date affects initial returns. The relevant coefficient estimates (for DAYS in Table IV) are generally positive, but very small and statistically insignificant. Similarly, the equity fraction retained by government does not appear to be related to initial returns. Again, the relevant coefficient estimates (for GOVT) are tiny and insignificant.

Jones *et al.* (1996) present regression results for a sample of 67 initial share issue privatizations. For one regression, they report finding a statistically significant negative relation between initial returns and offer size. Our point estimates of the offer size effect, the coefficients for VAL/GDP, are negative as well. In our sample, however, the estimate does not differ significantly from zero.

We do find that the order of the privatization is related to initial returns. The estimated coefficients on ORDER, however, are positive. These results tend to reject the hypothesis that initial returns are higher for the first privatization offers within a country than for subsequent offers. This finding is somewhat surprising in light of the widely held belief that privatization initial returns were high in the early years and have fallen recently. To examine this issue further, we performed regressions similar to those reported in Table IV, but included a dummy variable (POST1988) set equal to one for all privatizations occurring after 1988 and equal to zero for those occurring in 1988 or earlier. 1988 is a natural date to distinguish the early from later privatizations because (in our sample) no privatizations occurred between December 1988 and November 1989. This ten month window, therefore, neatly separates two periods of more frequent privatization activity.

The results of the regressions including POST1988 (not reported) confirm the popular view. The estimated coefficient for POST1988 ranges between -0.259 and -0.236 . Most of the estimates are significant at the 0.01 level and all are significant at the 0.05 level. Taken together with the positive coefficient on ORDER, these results indicate that privatization returns have fallen over time across countries but that within a given country privatization returns tend to increase over time. Other coefficient estimates reported in Table V are not materially affected by the addition of POST1988 to the regressors.

Our results in Table IV suggest that employee and foreign participation may be related to the pricing of privatization offers, but the evidence there is weak. The estimated regression coefficients for the variables measuring employee participation (EMPLOYEE) are positive and those for the variables measuring foreign participation (FOREIGN) are negative. These results are consistent with the univariate results reported earlier and tend to support the general proposition that political factors influence privatization offer pricing. None of the bootstrap *t*-statistics for the coefficients of EMPLOYEE and FOREIGN, however, are significant. Therefore, these results are quite fragile.

Table V

Regressions for Privatization Initial Returns with United Kingdom (U.K.) Privatizations Treated as a Separate Class

Market-adjusted one-day initial returns for privatizations are regressed on a dummy variable distinguishing U.K. privatizations, the number of days between price setting and first trade date (DAYS), fraction of equity retained by the government (GOVT), value of the offer divided by country gross domestic product (VAL/GDP), employee (EMPLOYEE) and foreign (FOREIGN) participation, and dummy variables distinguishing capital market development (PRIMITIVE) and firm regulatory status (REGULATED), and on a variable indicating the order of the offer within the country's privatization program (ORDER). PRIMITIVE equals one for privatizations in primitive capital markets and zero otherwise. REGULATED equals one for privatizations of firms in regulated industries and zero otherwise. The variable ORDER equals one for the first fixed-price share sale privatization offer within a country, two for the second offer, and so forth. Coefficients are estimated by ordinary least squares (OLS) regression. The *t*-statistics, based on the OLS standard errors, are given in parentheses (top) and on bootstrapped standard errors in brackets [bottom]. a, b, c denote significance at the 0.10, 0.05 and 0.01 levels respectively for two-tailed tests.

Regressor	Coefficients			
Constant	-0.050 (-0.655) [-0.707]	-0.167 (-1.691 ^a) [-1.830 ^a]	-0.266 (-1.734 ^a) [-1.675 ^a]	0.075 (0.595) [0.383]
United Kingdom	-0.025 (-0.285) [-0.301]	-0.158 (-1.470) [-1.506]	-0.400 (-3.017 ^c) [-2.830 ^c]	-0.018 (-0.205) [-0.142]
Days		0.001 (0.686) [0.705]	0.001 (0.896) [0.849]	-0.001 (-0.682) [-0.433]
GOVT		0.001 (0.881) [0.936]	0.001 (0.693) [0.685]	-0.001 (-0.344) [-0.224]
VAL/GDP		-5.908 (-0.615) [-0.630]	-4.678 (-0.464) [-0.429]	-0.426 (-0.075) [-0.038]
Order		0.025 (2.917 ^c) [3.103 ^c]	0.042 (4.149 ^c) [3.877 ^c]	0.009 (1.088) [0.752]
Employee Yes, No (1, 0)			0.153 (1.284) [1.241]	
Share of Co. (%)				1.487 (1.585) [1.054]
Foreign Yes, No (1, 0)			-0.105 (-0.960) [-0.961]	
Share of Co. (%)				-0.593 (-1.700 ^a) [-1.142]
Primitive	0.407 (4.782 ^c) [4.966 ^c]	0.296 (2.992 ^c) [3.203 ^c]	0.220 (1.985 ^a) [1.961 ^a]	0.423 (4.374 ^c) [3.123 ^c]
Regulated	0.252 (3.216 ^c) [3.455 ^c]	0.199 (2.363 ^b) [2.307 ^b]	0.226 (2.435 ^b) [2.504 ^b]	0.036 (0.631) [0.421]
Adjusted R ²	0.208	0.243	0.313	0.484
N	109	108	95	61

The results regarding the influence of capital market development are more robust than those on employee and foreign participation. The regression results in Table IV reinforce those of the univariate tests previously discussed. Initial privatization returns are higher in primitive capital markets than in developed capital markets. Capital market development appears to have a pronounced impact on offer pricing. The point estimates of the capital market development coefficient (those for PRIMITIVE) imply incremental expected initial returns between 32.5 percent and 42.6 percent for privatizations in primitive, as opposed to developed, capital markets. These estimates are statistically significant in all instances judging by either parametric or bootstrap *t*-tests.

All of the regressions reported in Table IV indicate that initial returns are higher also for offers of regulated firms than for unregulated firms. In two of the regressions the effect of regulation is statistically significant at conventional confidence levels (using the bootstrap *t*-statistics), unlike the univariate test result. In the other two regressions the estimated coefficient of REGULATED is not significant. These insignificant results pertain to the regressions that include among the independent variables measures of employee and foreign participation in the offer.

We were unable to obtain measures of employee and foreign participation for all the offers in our sample, so the relevant sample size declines when these measures are included among the regressors. Depending on the measure of participation used in the regression, as many as 48 offers must be dropped because of missing data. These 48 offers include 15 in the regulated group with an average initial return of 45.7 percent. In contrast, the 33 offers in the unregulated group that were dropped had an average initial return of 23.2 percent. The difference between these two averages is statistically significant at the 0.01 level.

Overall, the results in Table IV suggest that firm regulatory status influences initial returns. Although 33 of 55 privatizations of firms in regulated industries occurred in the United Kingdom, the regulation effect we find is not limited to the United Kingdom. Table V reports results of regressions that include a dummy variable (UNITED KINGDOM) set equal to one for U.K. offers and zero otherwise. The positive impact of regulation on initial returns is still apparent after controlling for any separate United Kingdom effect. These results indicate that uncertainty about regulation contributes to uncertainty about the value of offers and to underpricing. This evidence, therefore, lends support to asymmetric information-based explanations of underpricing in privatization offers, such as Perotti (1995).

The results in Table V show that, after controlling for other factors, initial returns in United Kingdom privatizations may be *less* than those for privatizations in other countries. In six of the eight regressions, the estimated coefficient for the UNITED KINGDOM dummy variable is negative and in two of these it is significantly negative. In none of the regressions is the estimated coefficient significantly positive. This is surprising because most discussions of U.K. privatizations assert that, to further its political agenda, the U.K. gov-

ernment deliberately priced offers to yield unusually *high* initial returns compared to privatizations in other countries.⁷ The evidence we report tends to refute this assertion. If anything, initial returns in United Kingdom privatizations seem anomalously *low* in comparison to those in other countries, even though they are significantly *higher* than initial returns for U.K. private company IPOs.

IV. Conclusions

If there is a *general* tendency for government officials to underprice IPOs to a greater degree than their private company counterparts, it is not revealed reliably in our sample. Only for the U.K. does the evidence persuasively support this type of political objectives hypothesis. The Canadian and Malaysian evidence, though, tends to reject this hypothesis in favor of the proceeds, or value, maximization theories. Overall, across seven countries jointly, we can not reject the hypothesis that mean initial returns of IPOs of state-owned companies are the same as IPOs of privately-owned companies.

Our results help to illuminate the cross-sectional determinants of initial privatization returns. We find that privatization initial returns for firms in regulated industries tend to exceed those for firms in unregulated industries. This result does not appear to be driven by the United Kingdom experience even though in our sample approximately half the privatizations of firms in regulated industries occurred in the United Kingdom. We find also that initial returns for privatizations in the relatively primitive capital markets of Hungary, Malaysia, Poland, and Thailand tend to exceed those for privatizations in the more highly developed capital markets of Canada, France, Japan, and the United Kingdom. Primitive capital market conditions and nascent government regulation may increase uncertainty about the intrinsic value of privatization offers and depress offer prices. Given this interpretation, this evidence is consistent with offer pricing theories that emphasize asymmetric information. This is not, however, the only possible interpretation of the evidence. For example, governments in countries with relatively primitive capital markets may seek to broaden private share ownership by substantially underpricing privatization offers. And, as in Perotti (1995), marked underpricing of regulated firms may arise from informational asymmetries *in conjunction with* the political vulnerability of regulated firms. Therefore, the evidence relating privatization returns to capital market development and regulatory status is consistent also with theories that emphasize the various political objectives of government officials.

Our cross-sectional regression results, though, are inconsistent with at least some plausible hypotheses based on political factors. The evidence rejects the hypothesis that government officials design their privatization programs to build political support over time by ensuring especially attractive returns in

⁷ See, for example, a recent article in *Euromoney* (Kerr (1996), p. 22) which states that "... the early UK privatizations were nearly a license to steal."

the first few privatizations. Moreover, we find that initial returns to privatizations in the United Kingdom, after controlling for other factors, are significantly *lower* than those in other countries. This undermines the common view that unique political circumstances led the U.K. government deliberately to underprice their privatization offers to an unusual degree. Similarly, the results do not uniformly provide strong support for the asymmetric information theories. We find that initial privatization returns are not significantly related to the length of time between offer price setting and first trade date, or to offer size.

Despite some exceptions, however, the bulk of our regression results provides considerable support for the underlying political and economic theories from which the regression specifications arise. Nearly all of the estimated coefficients have the predicted signs and in many cases the estimates are highly statistically significant. It is especially remarkable that the regressions explain as much as 49 percent of the initial return variance. Judging by this measure, our attempt to understand initial privatization returns is notably more successful than similar empirical analyses of private company IPOs.

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