Underpricing of New Equity Offerings by Privatized Firms: An International Test[*]

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Abstract

In this paper, we study a large sample of 507 privatization offerings from 39 countries over the period 1979-1996. Our objectives are twofold. First, we document the extent of short-run underpricing of these privatization offerings and measure their variation across countries, industries, and years, as well as drawing comparisons to private company IPOs. Second, we test alternative explanations of the determinants of short-run underpricing drawing on various models of maximizing behavior by underwriters, augmented by variables that proxy for national political objectives. Overall, we find support for elements of asymmetric information theory, investor sentiment theory and the reputation building hypothesis. With the exception of the Gini coefficient, our political proxy variables are typically not significant. Thus to a significant degree, the investment banking strategies believed to characterize IPOs of private companies in industrial countries may also play a role in the IPO strategies of state-owned-enterprises in both industrial and lesser developed economies.

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1. Introduction

Previous empirical research has found that initial public offerings (IPOs) tend to be underpriced leading to positive initial short-run returns. Until recently, these studies focused exclusively on the IPOs of privately (or closely) held enterprises primarily in developed financial markets, and to some degree in smaller markets.[1] Because these IPOs are transactions among private agents, theories of underpricing relied on some form of market failure, usually related to asymmetric information.

Since the late 1970s, the transformation of formerly state-owned-enterprises (SOEs) has provided another important source for IPOs. Privatization of SOEs was a key element of Margaret Thatcher's economic strategy for the United Kingdom in the early 1980s. Since then, privatization has expanded across other developed countries as well as smaller developing economies. For the period 1988-1993, Sader (1995) reports 2,655 privatization transactions (including private sales and public offerings) across 95 countries that generated total issue proceeds of US$271 billion. Our own analysis covering 1970-1996 finds $510 billion raised through public share offerings

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[1] One of the first studies of the U.S. IPO market is Ibbotson and Jaffe (1975). Recent studies incorporating larger sample sizes include Ritter (1991) and Ibbotson, Sindelar and Ritter (1994). See Loughran, *et al.* (1994) for a study of IPO performance for 15 industrial and 9 developing countries.

(excluding private sales). Recently, the OECD (1998) estimated that proceeds from privatization sales reached $153 billion in 1997 alone, with about $69 billion raised through public offerings.

Very few papers have analyzed the behavior of returns on privatization IPOs or the determinants of these returns. Dewenter and Malatesta (1997) study 109 privatization IPOs (64 from four developed countries and 45 from four emerging markets). The authors conclude that on average the initial returns of privatization IPOs and private company IPOs are similar. In addition, the authors find that privatization initial returns depend significantly on several country, industry and offer-specific variables. However, as government is part of every privatization IPO, the authors caution that their evidence is also consistent with theories that emphasize various political objectives. Jones, *et al.* (1999) examine a larger sample of privatizations (630 episodes from 59 countries) and find evidence of underpricing (on average). For a smaller sub-sample of 93 episodes, the authors report significant variation in underpricing across firms which they attribute to various political and economic objectives of governments.

In this paper, we study a comparably large sample of 507 privatization offerings from 39 countries over the period 1979-1996. Our objectives are twofold. First, we document the extent of short-run underpricing of these privatization offerings and measure their variation across countries, industries, and years, as well as drawing comparisons to private company IPOs. Second, we test alternative explanations of the determinants of short-run underpricing drawing on various models of maximizing behavior by underwriters.

The process of privatization involves government officials in the sale of state-owned assets. Hence, it is natural to suppose that political forces play some part in the privatization process – from the selection of which assets are put up for sale, to the selection of the lead manager, and to the pricing discounts allotted to employees and small domestic investors. Indeed some authors have made the role of government central to their analysis of privatization.[2] And some empirical studies have uncovered little empirical support for asymmetric information variables, and instead attribute privatization IPO underpricing to "the tendency of governments to trade off sales proceeds to achieve share allocations and control restrictions that reflect political and economic policy objectives."[3]

We do not deny that political thinking influences elements of the privatization process. Governments have a preference for allotting shares to key domestic residents and retaining control similar to the preferences of private owners in a conventional IPO. However, in our view as long as some shares are offered to the general public, we expect that these shares will be priced in accordance with the returns available from other conventional IPOs of private sector firms. Government cannot achieve less underpricing in order to maximize issue proceeds, because investors will demand underpricing consistent with levels elsewhere. And government cannot allow consistently greater underpricing for fear that it will be accused of "giving away the crown jewels." While privatization IPOs are a special category of IPO, under competitive

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[2] See Perotti (1995) and Perotti and Guney (1993).
[3] Jones, *et al.* (1999, p. 251).

conditions they will be priced in a manner consistent with other conventional IPO opportunities. Thus, we predict that asymmetric information variables should also be significantly related to privatization IPO underpricing.

Overall, our empirical results offer support for explanations of privatization underpricing related to asymmetric information, investor sentiment theory and the reputation building hypothesis. With the exception of the Gini coefficient, our variables that proxy political objectives are typically not significant, or are made insignificant by the inclusion of other variables. Thus to a significant degree, the investment banking strategies believed to characterize IPOs of private companies in industrial countries may also play a role in the IPO strategies of state-owned-enterprises in both industrial and lesser developed economies.

The remainder of the paper is organized as follows. We begin by presenting an overview of the privatization process, drawing attention to those factors that distinguish an IPO for a state-owned-enterprise from an IPO for a private company. In section 3, we review the theoretical literature on underpricing in IPOs and highlight the most relevant empirical evidence. We describe our data and methodology in section 4. And we present our empirical results on the variation in IPO returns and their determinants in section 5. Concluding comments and comparisons with other studies are in the final section.

2. An Overview of Privatization

a. Economic and Political Forces

Privatization is the modern word used to describe the transfer of the ownership and control of productive assets from government hands to the private sector. Various procedures including the outright sale of assets, industry deregulation, and out-sourcing various government services to private firms all fall within the scope of privatization. In this paper, we focus only on the sale of state-owned-enterprises (SOEs) to private investors.

The German government's sale of an 80% stake in automaker Volkswagen in 1961 marked the first major privatization in the post-World War II period. But in no way did this deal begin a trend. Industries such as banking, transportation, petroleum and other resources extraction activities, telecommunications, heavy manufacturing and, of course, defense-related industries were deemed a critical part of the national interest in many democratic, industrial countries. And in communist countries, all important productive assets (with the exception of agriculture) were government owned.

Over the last 20 years, both economic and political forces have supported the momentum toward privatization. The basic economic argument (that government-owned companies are less likely to achieve operating efficiency) became more critical as firm size, capital requirements, and technology increased. Governments in countries as distinct as the United Kingdom and Chile concluded that privatization of state-owned companies was the preferred strategy for maintaining global competitiveness and building national income. In

1981, the Conservative Government led by Price Minister Margaret Thatcher started its own privatization program by selling off a majority stake (51.6%) in state-owned British Aerospace.[4]

Progress toward European Union provided further incentives for privatization sales. In the late 1980s as part of its drive toward a "single market," the European Union imposed limitations on government subsidies to SOEs that could lead to unfair competition. And in the 1990s, membership in the European Monetary Union (EMU) required countries to lower their fiscal budget deficits and official debt levels. Privatization sales, especially of money losing firms, helped countries meet their EMU membership criteria.

In emerging markets, the debt crises of the 1980s led to a number of market-oriented reforms. Many of these countries saw foreign capital inflows as the engine of growth, and they were willing to relax controls on foreign ownership in exchange. The break-up of the Soviet Union and freeing of Eastern European economies led to a wave of privatization as productive assets were either closed down or restructured and spun off.

The demand side through the development of global capital markets also played an important role. Assets with the scale of many established national firms could not be sold efficiently without tapping large pools of capital from around the world. Institutional innovations such as the global security offering and the Rule 144a market in the U.S. brought more investors into the market for privatization IPOs.

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[4] It is often overlooked that the Labor Government had previously sold a 17% stake in British Petroleum in June 1977 raising £564 million.

b. Comparing Private Company and Privatization IPOs

While both conventional IPOs (by private owners) and privatization IPOs (by governments) result in a transfer of share ownership to new owners and financial wealth to the old owners, there are important differences between the two transactions.

First, a government (unlike a private seller) may have many goals in mind other than maximizing the sales price of the current IPO. A government privatization program may span several years and include dozens or even hundreds of IPOs. For larger SOEs, the government may sell only a portion of its stake in the IPO, and follow up with additional seasoned equity issues. As a result, the government is likely to be a more frequent issuer and with larger size issues than any private sector firm. By implication, the government may be more likely to underprice its earlier privatization offerings to build its reputation. Such a strategy could maximize the net present value of an entire privatization program, rather than each individual issue in isolation. However, the government may also have political objectives in mind. Dispersing share ownership of underpriced IPOs among small investors could be a way to curry favor with voters. But dispersed ownership could also represent an attempt to capture positive externalities by establishing a culture of private investing and deepening local capital markets and raising the value of future offerings.

Second, an SOE on the verge of privatization is very different from a traditional private sector firm preparing for an IPO. A new, fledgling private firm making its IPO would be considered riskier than the average established publicly held firm. So the systematic risk (or *beta* coefficient) for a conventional IPO likely exceeds one. By comparison, a privatization IPO usually involves a firm with substantial assets and a long operating history. In certain cases (such as energy, telecommunications, banking, among others), the privatization IPOs may be in industries that are highly concentrated (in the local market), highly regulated, or both. Thus, privatization IPOs may be perceived as having lower cash flow risks.

Despite these differences, we conjecture that privatization IPOs and conventional private sector IPOs are similar in that the marginal shares from both are sold into the same market place. While additional factors could bear on the pricing of privatization IPOs, the same considerations that investors take into account when pricing conventional IPOs should be at work in the market for privatization IPOs.

3. Theory and Empirical Regularities on Initial Public Offerings

The empirical literature on IPOs has established three stylized empirical regularities. The first, known as the "new issue anomaly," is that IPOs are on average substantially underpriced in early market trading. The second regularity is the existence of "hot issue" (in which average initial returns are unusually high) and "cold issue" markets (in which the opposite is observed). The third empirically regularity focuses on long-run returns for IPOs, where it has typically been found that over a period of several months to several years, the abnormal returns relative to a benchmark portfolio are usually significantly negative. Our focus in this paper is on short-run underpricing.

a. International Evidence on Short-run Underpricing

The IPO market in the United States has been examined extensively. Studies of U.S. IPOs report that average initial returns are near 15% with most estimates in the 10-20% range. In an early study of 2,650 IPOs in the 1960s, Ibbotson and Jaffe (1975) find that average initial returns are 16.83%. In a later study of 1,526 IPOs in the period 1975-1984, Ritter (1991) reports average initial returns of 14.32%. In a still larger sample of 10,626 IPOs spanning a longer time period (1960-1992), Ibbotson, Sindelar and Ritter (1994) report average initial returns of 15.30%.

In other countries, average initial returns on IPOs of privately held firms are always positive, but show much greater variability.[5] IPO samples in Belgium,

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[5] See Loughran, et al. (1994) for a summary of other studies, and Huang (1997) for a literature review.

Canada, Finland, France, Netherlands, and the United Kingdom illustrate similar or smaller degrees of underpricing compared to U.S. IPO samples. For example, in a study of 131 French IPOs between 1983 and 1986, Husson and Jacquillat (1990) report that the average (market-adjusted) initial return is 4.0%

By comparison, studies of IPOs in other industrial countries (Australia, Germany, Italy, Japan, New Zealand, Portugal, Spain, Sweden, and Switzerland) have displayed greater (and sometimes considerably greater) average initial returns in the range 21.50% to 54.40%. In some cases, however, the results are noticeably time varying with underpricing in Australia and Germany estimated at 29.20% and 21.50% in early samples, falling to 11.90% and 10.90% respectively in more recent samples.

In developing economies, average initial returns (for conventional IPOs) are still more variable and typically greater than for the United States. For the 1979-1983 period, Dawson (1987) reported average initial returns of 13.80% in Hong Kong and 166.67% in Malaysia. In other countries (Brazil, Korea, Singapore, Taiwan, Thailand) estimates of short-run underpricing in the 25% to 80% have been reported. Mexico is a lone exception, where in a sample of 44 IPOs from 1987-1990, Aggarwal *et al*. (1993) estimate initial returns of only 2.80%.

Several explanations are possible for these cross-country differences. Institutional differences probably play an important role, as underwriters follow different price setting and distribution strategies across countries, and governments may impose severe constraints on the price setting or share

distribution process. For example, South Korea (prior to the June 1988 reform) and Malaysia (where underpricing was most severe) imposed bindings constraints on the offer price. Loughran, *et al.* (1994) argue that in their study, underpricing is generally greater where the offering price is set prior to obtaining information about demand. Dewenter and Malatesta (1997) confirm that underpricing is greater the longer the time between setting the offering price and the initial market trade date.

The "hot issue" ("cold issue") regularity was documented initially for the U.S. market by Ibbotson (1975), and reconfirmed by Ritter (1984). Loughran, *et al.* (1994) show that a similar correlation between the level of stock prices and IPO volume is also often found in markets outside of the United States. The tendency for a high volume of IPOs to follow periods of abnormally high market returns could reflect a combination of positive feedback trading from investors and opportunistic behavior by corporate issuers. The general pattern indicates that issuers or underwriters are able to successfully time their offerings when the market is optimistic about IPOs in general and when the demand for IPOs is high, in order to achieve a smooth distribution of shares and raise a large amount of capital.

b. Alternative Theories of IPO Underpricing

An initial public offering of securities brings together the current owners of the firm, a financial intermediary (the underwriter), and a set of potential new shareholders all within a particular institutional framework. Various theories of

underpricing have been proposed that focus on one or more of the players in the IPO process. We summarize the most important theoretical models that attempt to explain the empirical regularities in the conventional new issue market.[6]

(1) Principal-Agent Theory and Costly Monitoring

Baron's (1982) model combines principal-agent theory, asymmetric information and costly monitoring. Financial intermediaries (underwriters) are assumed to have superior information (relative to the issuing firm) about pricing conditions in capital markets. Because the issuing firm (the principal) cannot perfectly monitor the underwriter's (agent's) efforts in marketing the new issue, the model predicts that underwriters tend to underprice IPOs both to minimize their selling efforts and to maximize the probabilities of a successful offering.

Muscarella and Vetsuypens (1989) present a clever test of Baron's model by examining the IPOs of 38 investment banks that went public from 1970 to 1987. There should be neither information asymmetries not principal-agent problems in this sample. So Baron's model would predict that underpricing should be less severer than in other IPOs. Yet Muscarella and Vetsuypens find significant underpricing comparable to other IPOs of similar size, and even a higher degree of underpricing in many cases where issuers act as their own led manager. These results are not consistent with the prediction of Baron's model.

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[6] An additional theory proposed by Tinic (1988) is that underpricing represents a form of insurance against legal liability for the issuer in the event that the firm does not perform well. Clearly the legal liability of issuers differs from country to country. And the legal liability hypothesis has been questioned even for the U.S. markets. See Drake and Vetsuypens (1993).

(2) Asymmetric Information and the Winner's Curse Hypothesis

Rock's (1986) model relies on another information asymmetry, that between informed and uninformed investors. The model posits that informed investors subscribe to IPOs only when they expect a positive initial return, while uninformed investors subscribe to every IPO. If underpriced, IPOs would be oversubscribed by informed investors, resulting in rationing of shares to uniformed investors. If overpriced, IPOs would be sold exclusively to uninformed investors who would earn negative initial returns (thus, the so-called "winner's curse"). Because issuers must continue to attract uninformed as well as informed investors, new issues must be underpriced (on average) to provide uninformed investors with acceptable rates of return. Rock's model thus predicts that underpricing is an equilibrium and ongoing phenomenon. Extensions of the model predict that expected underpricing is greater the greater is the *ex ante* uncertainty about the value of a new issue.[7]

Empirical evidence (Koh and Walter, 1989 and Michaely and Shaw, 1993) generally confirms the major implications and predictions of Rock's model. In the case of privatization sales, it can be argued that SOEs are usually large, well-known firms and governments make genuine efforts to provide the general public with information prior to the public offering. While these efforts might result in information asymmetry for privatization IPOs that is no greater than (and possibly less than) for conventional IPOs. On the other hand, privatization IPOs may harbor additional uncertainties related to the governments commitment to the privatization process, it commitment to market-based reforms, and the ability

of the new managers to make the transition to a competitive market system. Governments, as partial owners after an IPO, may still exercise some control over the day-to-day operation of the firm, and act to reach political goals rather than act for the benefit of shareholders. Moreover, the scale of many privatization sales may pose an additional risk (for underwriters with scarce capital) that provides an additional incentive for underpricing.

(3) <u>Reputation Building Hypothesis</u>

Because underpricing is costly to the issuing firm, firms have an incentive to reveal their low-risk character to the market. Carter and Manaster (1990) theorize that one way for firm to signal their quality is by selecting underwriters with high prestige. The authors offer empirical evidence that underwriter prestige is positively associated with the marketing of low risk IPOs.

The notion of reputation building might also apply to firms or governments that make repeated public offerings of securities. In this context, it is in the interest of those firms and governments to gain a reputation as a good issuer. This theme summarizes the signaling hypothesis, which we discuss next.

(4) <u>Signaling Theory</u>

Signaling theory applies to an issuer who intends to sell shares through an initial public offering and subsequent (seasoned) public offerings. Given the existence of both good and bad firms and asymmetric information, investors will value a signal that the IPO is from a good firm. A good firm can afford to signal

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[7] See Beatty and Ritter (1986).

by underpricing its IPO, because only good firms can be expected to recoup their initial loss after their true performance is realized. By bearing a large initial cost, good firms can credibly signal their type. Bad firms run the risk that their true type will be realized, and so they cannot afford to signal.

Signaling theory relates directly to the discussion of privatization IPOs. The selling government is a large issuer who is likely to return to the IPO market more often than any individual firm. A privatization program sets the government on course to sell dozens and possibly hundreds of public assets in a sequence. Given the scale of some SOEs, the government may begin with an IPO for a partial stake in the firm, followed by one or more seasoned offering for the remainder.[8]

The signaling hypothesis predicts that a selling government should use underpricing of the initial public offering, along with a partial/gradual sales strategy to send a credible signal to the market and maximize the gross proceeds from its overall privatization program. Earlier studies (Jenkinson and Mayer, 1988) find that seasoned issues in the British privatization program experience less underpricing than the IPOs.

(5) Investor Sentiment Theories

The theories reviewed so far focus on the IPO price, and appeal to rational or equilibrium models to generate underpricing. The investor sentiment

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[8] The government may retain a special share (or "golden share") granting it various rights and restrictions such as the citizenship of the CEO, limitations on foreign share ownership, restrictions on asset disposals, and so forth. These conditions may continue even after the government has fully disposed of all ordinary shares.

approach focuses instead on after-market pricing, and argues that irrational

investor over-optimism may drive up the prices for IPOs resulting in the

underpricing that is so well documented in the literature. When investor demand

for IPOs is subject to "fads" rather than on valuation based on fundamentals,

investor sentiment leads to initial underpricing.[9] Investor sentiment links easily to

the cycle of "hot" and "cold" IPO markets. And, as well, if the initial underpricing

effect is based on initial over optimism, this helps to reconcile the long-run

underperformance of IPOs.

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[9] The investor sentiment story can be fleshed out further by considering the impact of noise traders and other uninformed investors in the context of risks that limit arbitrage and pricing to fundamentals. See Shleifer and Summers (1990).

4. Data Sources, Empirical Methodology and Hypotheses

a. The Sample Data

The data on privatization transactions were assembled from several sources. Our primary sources were the *Privatization Yearbook 1994* and Sader (1995). These sources were augmented by various business magazines and newspapers including the *Wall Street Journal Index, 1990-95 Annual; Financial Times, Euromoney, Investment Dealer's Digest* and the Securities Data Corporation new issue database. In addition, descriptive data were obtained from the Privatization Database maintained by Privatisation International Ltd. These sources were supplemented by information from government privatization agencies, stock exchanges, and requests made directly to individual firms. Our source for aftermarket trading prices of IPO shares and local stock market returns (adjusted for dividends and splits) is *Datastream*.

This search produced a sample of 507 new offerings made by 387 privatized firms from 39 countries from 1979 to 1996.[10] Summary information about the sample is reported in Table 1. The sample consists of 330 initial public offerings (IPOs) and 177 seasoned public offerings which raised total proceeds of $352 billion.[11]

Our sample is broadly similar to the sample analyzed by Jones, *et al.* (1999) who also used Privatisation International as their primary source. The Jones, *et al.* sample contains 630 firms, and includes a large number of Chinese

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[10] A complete list of all firms in the sample is in Appendix A of Huang (1997) or available from the authors.
[11] The offerings should be classified as secondary (rather than primary) since in most cases the governments sold existing shares rather than capital-raising shares.

IPOs along with several other countries we chose to exclude. In the case of China, we concluded that the Chinese market is in a more primitive stage than other emerging markets, making it more subject to manipulation, insider trading, and so forth – and deserving of a separate rigorous study.[12]

Across our entire sample, the average offering size was $717 million while the median was $163 million, indicating a distribution skewed to the right by some very large deals. The largest issues in our sample are the three consecutive NTT (Nippon Telephone and Telegraph) issues of 1987 and 1988 which raised $15.5, $40.3 and $22.8 *billion* respectively. Overall, 79 deals (about one-sixth of our sample) each raised in excess of $1 billion. The mean and median values in our sample are much greater than those for conventional IPOs outside the United States. For a sample of 21 countries, Loughran *et al.* (1994) report that mean issue proceeds range from $6 million in Brazil to $109 million in Italy. Clearly privatization IPOs are far larger than the typical conventional offerings outside the United States.

For those 297 IPO cases reporting data, governments sold an average stake of 47.3%. In 44 of those cases, the government sold a 100% stake. Seasoned offerings tended to be larger deals (in terms of mean and median proceeds) but represent a smaller percentage stake, only 25.1% on average. The implication of this result is that governments tend to sell larger companies off in a series of tranches, while larger stakes are initially offered in smaller companies.

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[12] Indeed, a recent study by Su and Fleisher (1999) finds that the mean initial return on 308 Chinese IPOs from 1987 to 1996 was 948.6%.

Our sample includes 57 privatization offerings in the United Kingdom and 255 from all of Western Europe. Issue proceeds in these transactions were considerably larger, and governments sold larger percentage stakes, than in the complementary non-U.K. or non-Western European samples. Based on 191 cases, roughly 39% of all offerings were allocated to foreigners. By comparison, the foreign allocation in the United Kingdom, where capital markets are well developed, was only 23.5%. In a sample of non-OECD countries, the foreign allocation was 46.6%, reflecting a far greater reliance on foreign investors. We find this even though non-OECD deals tend to be much smaller, with a median offering size of $49 million versus $379 million in OECD countries.

Nearly half of our sample reflects transactions in non-Western European countries. A complete list of offerings and issue proceeds by country is in Table 2.

The industry patterns for our sample are detailed in Table 3. The median offering size in infrastructure industries is $488 million, or at least twice what we observe in financial services or primary sector firms, and ten times or more greater than offerings in industrial manufacturing and other industries. Infrastructure itself appears to be dominated by offerings from telecommunications and utilities, where the median offering size in our sample is $932 million and $700 million respectively.

b. Empirical Methodology

To analyze the short-run underpricing effect, we compute the initial return. For an IPO, the initial return on stock *i* is defined as the percentage return from the offering price to the first market price available:

$$r_{i0} = [\frac{P_{i1}}{P_{i0}} - 1] \times 100\% \tag{1}$$

where P_{i1} is the first market price of stock *i and* P_{i0} is the official offer price. In most cases, we are able to determine the exact listing date of the IPO and the closing price at the end of the first trading day is used for P_{i1}. The initial return is not adjusted for overall market movements.

The initial return is the sole dependent variable in our study and our measurement of it deserves further elaboration. P_{i0} is the offer price that an investor without any preferential treatment would pay. This is usually the offer price available to institutional investors and foreign investors. Because certain retail investors and employees are sometimes offered shares at a discount or on special financing terms, our returns in equation (1) are a conservative estimate. The primary source for offer price data and the first trading day price was Privatisation International. Datastream was used to cross-check against first trading day prices and to supplement a small number of missing prices.

For a seasoned offer, the initial return is calculated similarly. We take the going market price on the announcement day as P_{i0} and the first market price

after the seasoned offer as P_{i1}. For seasoned offerings, the Privatisation

International database is our primary source for P_{i0}.

Given the eclectic nature of theories of IPO underpricing, our initial tests

examine the differences across mean initial returns for various sub-samples.

These test comparisons draw mostly on the theories of reputation building,

asymmetric information and investor sentiment.

In order to control for some of the factors that may effect initial returns, we

also propose a multivariate regression model. The dependent variable is the

actual initial return (r_{i0}) as a proxy for the expected degree of underpricing. The

explanatory variables that we associate with conventional IPO offerings include

the volatility of the stock's aftermarket prices (as a risk measure), the volatility of

the market index prior to the offering (as another risk indicator), the stock market

trend in the month prior to offering (as an investor sentiment indicator), the issue

size of the offering, an OECD dummy variable, and six industry sector dummies,

In our regressions, we augment these variables with a set of variables

designed to proxy for national political objectives. These variables include a

dummy variable for the sale of a controlling interest (greater than 50%), the

national budget deficit as a percent of GDP, the percentage of shares sold to

employees, the Gini coefficient of income inequality, and the percentage

allocation to foreign investors. *Privatisation International* is our primary source

for the allocation data, shares to employees and to foreigners. Annual data on

the national budget deficit and GDP are from *International Financial Statistics*. A

time series of Gini coefficients is available through the World Bank.[13] These

variables are summarized in Tables A1 and A2.

As we discuss in the next section, the empirical regression results shed

light on the role played by reputation building, asymmetric information and

investor sentiment theories for pricing privatization offerings, as well as the role

of political objectives.

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[13] See World Bank, 1998, Deininger and Squire Data Set, accessible at internet website
http://www.worldbank.org/html/prdmg/grthweb/dddeisqu.htm

5. Empirical Results

a. Hypotheses Based on a Comparison of Mean Initial Returns

Based on our sample of 507 privatization transactions, we were able to compute initial returns on 297 issues as shown In Table 4. Across all 297 issues, the mean initial return was 25.6% while the median was 10.0%, suggesting that the distribution of initial returns is skewed to the right.

IPOs versus Seasoned Offerings

Both the reputation building and asymmetric information theories are relevant for comparing returns on IPOs versus seasoned offerings. The reputation building hypothesis postulates that the issuer (in our case, the government) builds credibility by following a carefully designed privatization plan. The plan may involve a series of stages, including partial privatization in an early stage, as a way for the government to signal the investment community. In the reputation building scenario, the government makes a commitment to its privatization policy. Shareholders benefit from underpricing in the early stages, so that later offerings (both of seasoned offerings of already partially-privatized firms and new IPOs) are more enthusiastically received. If the reputation building hypothesis is correct, IPOs will on average be more underpriced that seasoned offerings.

However, asymmetric information theory also predicts that the expected underpricing of high-risk offerings should be greater than for lower risk offerings. For IPOs, the relevant measure of uncertainty is not systematic, beta-type risk

but rather the gross uncertainty regarding the aftermarket price. Because there is no prior trading history for stocks of privatized firm, uncertainty (and therefore underpricing) should be greater for a privatization IPO than for a seasoned offering.

To test for these effects, we split the sample between IPOs and seasoned offerings. For 220 IPOs we estimate a mean initial return of 32.1% and for 77 seasoned offerings a mean initial return on 7.17%. Using a two-sample t-test that allows for unequal sample sizes and sample variances, we find that the initial return on IPOs is significantly higher than on seasoned offerings at the 1% level.[14] Table 4 also reports mean initial returns for all issues, returns for IPOs only, and returns for seasoned offerings broken down by geographic region. Except for Canada, we observe a similar finding with the initial returns on IPOs greater than for seasoned offerings. Where sample sizes permit, a t-test confirms that these differences are significant. These findings lend support to both the reputation building and asymmetric information theories.

Privatization IPOs versus Conventional IPOs

Because both asymmetric information and reputation building theories predict that IPOs should be more underpriced than seasoned offerings, we propose an additional test to distinguish the relevance of these two theories. As most SOEs are large and well-established firms, sometimes with dominant

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[14] The two-sample t-test is computed by $T = \dfrac{Mean(r_{IPO}) - Mean(r_{Seasoned})}{\sqrt{Var(r_{IPO})\big/N_{IPO} + Var(r_{Seasoned})\big/N_{Seasoned}}}$

market positions, it is reasonable to assume that they reflect less market (beta) risk than for the typical conventional IPO of a recently chartered private sector firm. Therefore, asymmetric information theory predicts less underpricing in privatization IPOs (*ceteris paribus*) than for conventional IPOs.

On the other hand, the owners of a SOE (i.e. the government) may use underpricing to build their reputation for later stages of their privatization program, or to achieve other political goals (such as wider share ownership). Therefore, the reputation building hypothesis predicts greater underpricing in privatization IPOs (*ceteris paribus*) than for conventional IPOs.

For those countries with three or more privatization IPOs and a prior study of the returns to conventional IPOs, we compare the returns on privatization and conventional IPOs.[15] Some studies of conventional IPOs report only the mean initial return and not the variance, and so we are limited to calculating a simple t-test as in Table 5 Panel A.[16] Other studies also report the variance of initial returns, which allows us to compute a two-sample t-test as in Table 5 Panel B.

The results are mixed. For the United Kingdom, France and Singapore, mean initial returns for privatization IPOs are greater than for conventional IPOs. In the United Kingdom and France, privatization IPOs have outperformed conventional IPOs by about 5-6 percentage points, and in Singapore the difference has been more than 11 percentage points. The results are highly

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[15] We lack data on conventional IPOs to make comparisons with our results on privatization IPOs for Austria (9 firms with IPO returns), Turkey (21), Argentina (5), Hungary (4) and Poland (24).

[16] In this case, the t-test takes the form $T = \dfrac{Mean(r_{IPO} - \bar{r}_{Conventional})}{\sqrt{Var(r_{IPO} - \bar{r}_{Conventional})\big/N}}$

significant for the U.K. and less so for France and Singapore. However, for the

five other countries in Table 5 (Germany, Italy, Canada, Australia, and

Malaysia), the results are reversed with greater mean initial returns for

conventional IPOs compared with privatization IPOs. The differences in returns

for Germany, Italy and Canada are significantly negative. These results do not

permit us to distinguish clearly between the asymmetric information and

reputation building hypotheses.

Developed Countries versus Developing Countries

In countries with well-developed capital markets there are often

more professional security analysts and more efficient information dissemination

mechanisms. This suggests that information asymmetry would be less severe in

these countries and uncertainty regarding the intrinsic value of a privatized firm

lower. Previous research has found that mean initial returns are lower in

countries with well-developed capital markets. Our own results (Table 4),

showed that initial returns can vary considerably across geographic regions.

We divide our sample countries between OECD and non-OECD countries

and test the difference in initial returns using a formal two-sample t-test. Our

results are in Table 6. Initial returns for 100 privatization offerings in non-OECD

countries average 58.1% compared to only 9.4% for 198 privatization offerings

in OECD countries. If we restrict the sample to only IPOs, the comparison is now

65.9% initial returns in non-OECD countries versus 11.1% initial returns in

OECD countries. These differences are highly significant and provide strong evidence favoring the asymmetric information theory.

Early versus Later Privatization IPOs

The reputation building hypothesis predicts that the average underpricing for early privatization IPOs should be greater than for privatization IPOs that are scheduled later. This prediction assumes that to enhance the success of a privatization program, the government may deliberately underprice IPOs to attract both institutional and retail investors. Reputation is enhanced by greater underpricing in early IPOs than in later IPOs.

Our sample permits us to investigate the pattern of returns over time within countries. For those countries with four or more IPOs, we compare the mean of early IPOs (defined as the first $N_i/2$) with later IPOs. The results in Table 7 show no systematic and significant pattern. For Poland, early initial returns average 210.0% and are far greater than later initial returns (54.0%), but the difference is not significant. The results are reversed for Malaysia where later initial returns reach 81.9% and exceed early initial returns by 16.5%. Pooling the results across countries produces a sample of 218 IPOs. In this sample, early IPO returns average 39.4% beating out later IPO returns of only 24.5%, but the difference is not significant. These broad results are consistent with a theory of reputation building, but the results do not show a consistent and significant pattern.

We also investigated the pattern of IPO initial returns aggregated across countries on a year-by-year basis. These results are shown in Table 8. Both 1987 and 1993 stand out as years with high mean and median returns relative to our sample. And correspondingly, 1988 and 1995 stand out as years with low mean and median returns. We reject that mean initial returns are identical across years. The smaller underpricing of IPOs in 1988 and 1995 (relative to the sample mean) is significant at the 95% level. In this sense, we can label 1988 and 1995 as "cold issue" years for privatization IPOs.

b. Hypotheses Based on Regression Analysis of Mean Initial Returns

We estimated multiple regressions using various combinations of the variables in Tables A1 and A2 to examine their marginal impact on initial returns conditional on other variables. Based on the various theories we have discussed, the expected signs of the coefficients are as follows:

$b_1 > 0$:   When aftermarket standard deviation of returns is an adequate proxy for *ex ante* uncertainty, asymmetric information theory predicts a positive relationship between risk and initial returns.

$b_2 > 0$ Investor sentiment theory predicts that initial returns are higher when the stock market has recently shown an upward trend.

$b_3 < 0$ Investor sentiment theory predicts that initial returns are lower when the stock market has recently shown greater volatility.

$b_4 < 0$ According to asymmetric information theory, it is reasonable to

expect that there should be less uncertainty about larger firms, as they are likely to be followed by more analysts, produce more information about their activities, and possibly have longer periods of operation. On the other hand, many privatizations occur in smaller capital markets with less promise for placing larger deals. If capacity is limited, larger issues will require greater underpricing to be placed. This "capital market capacity" hypothesis predicts that a higher degree of underpricing is required for a larger privatization offering, so that the coefficient b_3 is positive ($b_4 > 0$).

$b_5 < 0$ The asymmetric information theory predicts less underpricing in markets with more professional security analysts and information dissemination.

$b_j > 0$ The asymmetric information theory predicts that initial returns should be higher for those industries ($j = 6,11$) that are more susceptible to greater risk through government regulation.

$c_1 > 0$ The asymmetric information theory predicts that initial returns should be higher for those cases where the government retains voting control over the firm.

$c_2 > 0$ Government budget deficits can be an indicator of government size and public mismanagement, leading to greater initial returns.

$c_3 > 0$ Political theories of privatization suggest that underpricing is

greater as more shares are allocated to company employees.

$c_4 > 0$ Political theories suggest that underpricing is greater when income inequality is greater and government uses privatization to transfer wealth to the general public.

$c_5 < 0$ Reputation building predicts that underpricing is a tool that the government can use to build public support for a privatization program, underpricing also represents a wealth transfer from the state to shareholders. For a given level of underpricing, governments will be more subject to criticism the greater is the foreign allocation. Initial returns should be lower as foreign the allocation rises.

Along with the data we have used to this point, to estimate a multiple regression equation, we also require one month or two months of aftermarket stock prices to estimate the risk of the security. This requirement reduces our effective sample size. Our results are shown in Table 9, Panels A and B.

Regressions 1-5 report the results for various combinations of our conventional dependent variables. In each of these equations, the coefficient of lagged market returns is positive ($b_2>0$) and significant, indicating that underpricing of privatization IPOs is greater when the market has been rising. The coefficient of lagged market volatility is negative ($b_3<0$) and significant, indicating that underpricing is smaller when the market has been more volatile in the month before the IPO. The coefficient of the size variable is negative ($b_4 < 0$) and significant in specification 1, but not significant, or only marginally so, in

specifications 2, 3, and 4 when the OECD dummy is included. The coefficient of the OECD dummy is negative and significant in specifications 2, 3 and 4 ($b_5<0$) which supports the asymmetric information theory and suggests that privatization IPOs from OECD countries are (other things equal) less overpriced than for non-OECD countries. The margin of difference (about 0.50% less underpricing) is statistically significant, but economically small.

The coefficient on the stock's subsequent volatility is not significant in any of the specifications. This result is unchanged when we use volatility calculated over the subsequent two-month period. The industry dummy variables introduced in specification 5 are all positive and significant but add little in terms of R^2 over specification 4.[17] In subsequent specifications we omit these industry dummies. Overall, the R^2 for specifications 1-5 is about 0.35-0.40 which shows that the conventional variables explain a significant portion of variability in initial underpricing.

In Table 9, Panel B, we consider the role of variables intended to proxy possible political objectives of governments in privatization IPOs. Because data on these additional variables is not available for all observations in our sample, the sample size declines with each additional specification. In regression 6, we include the government budget deficit and Gini coefficient as explanatory variables. The government budget deficit variable is not significant but the Gini coefficient variable is positive and significant ($c_3 > 0$), indicating that underpricing is greater in countries with greater income inequality. However, the

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[17] We test and cannot reject the hypothesis that mean initial returns are equal industry sectors.

significance of the Gini coefficient disappears when we restore the OECD variable in specification 7.

In specification 8, we consider the impact of a control dummy (CD) for cases where more than 50% of the firm is sold. The control dummy coefficient is positive ($c_4 > 0$) as expected but only significant at the 15% level. In specification 9, we include the percentage allocation to employees and foreigners. This reduces the sample size substantially to N=63. Neither of these share allocation variables is significant, but the constant term and four conventional variables remain significant. The R^2 jumps to 73%. In specification 10, we include the government deficit and Gini coefficient variables. The Gini coefficient is positive and significant ($c_3 > 0$) as expected and as in specification 6.

Specification 11 includes all the conventional and political proxy variables. The sample size is N=55. The previous 1-month market trend, 1-month market volatility, and OECD dummy variables are significant at the 99% level, as is the Gini coefficient variable. The overall regression is highly significant with an $R^2 = 78\%$. For the sake of comparison, we ran specification 12 that includes only political proxy variables. The sample size is 55 as in regression 11. Both the government budget deficit and employee allocation variables have the correct sign, but only the budget deficit coefficient is significant. The R^2 for regression 12 is 36%. Taken together, regressions 11 and 12 show that political variables play a role in explaining privatization IPO underpricing, but when conventional variables are added, these variables pick

up most of the explanatory power leaving a much smaller role for the political

variables.

6. Conclusions

Over the last 20 years, privatization has become an important means for transferring ownership from government hands into the hands of private owners. While privatization sales have many things in common with conventional initial public offerings of privately-held companies, there are differences with respect to the objectives of the government owners, in the age, size, and riskiness of the companies, and in the securities markets where the IPO shares are likely to be sold and traded. These differences suggest that the underpricing of privatization IPOs could be more severe than for conventional IPOs. Moreover, these differences could suggest that a new theory that puts greater emphasis on political objectives is needed to explain the pattern of initial returns on privatization IPOs.

In this paper, we have argued that as long as shares are offered to the general public, traditional theories – of asymmetric information, reputation building, and investor sentiment – that are used to model the behavior of conventional IPOs should also be relevant for privatization IPOs. We presented evidence on a large sample of recent privatization IPOs. We compared the underpricing of these IPOs to underpricing in conventional IPOs. And we presented univariate tests of differences in means across sub-samples of IPOs and the results of multivariate regression analysis.

Overall, our results provide much support for elements of the traditional theories of asymmetric information, reputation building, and investor sentiment. Consistent with these theories, we find that initial returns on privatization IPOs

are significantly less than on seasoned offerings. And we find that underpricing

is less for privatizations in OECD countries, and other sub-samples of more

developed countries. We find evidence for "cold issue" markets for privatizations

after the 1987 stock market crash and 1994 Mexican financial crisis. Our

regression analysis confirms that recent market performance, recent market

volatility, future stock price volatility and privatizations originating in OECD

countries are significant determinants of underpricing. We find no consistent

evidence that the underpricing of privatization IPOs differs from conventional

IPOs.

We examined the impact of including several variables that proxy for the

political objectives of a government engaged in privatization. Variables reflecting

the allocation of shares to foreigners, to employees, the government budget

deficit, and a control dummy did not help to explain underpricing. The Gini

coefficient was generally significant indicating that where income inequality is

greater, underpricing is greater.

Both caution and good sense should be exercised in interpreting our

results. Clearly, governments are in the business of reaching "political"

objectives and privatization sales could be an important tool in that respect.

Nevertheless, privatization sales are offered into a competitive marketplace, and

are likely to be compared with conventional IPOs and other investment

opportunities. Both political and conventional variables could play a role in

explaining IPO underpricing. And, our classification of these variables as

"political" or "conventional" is not unambiguous.

Despite these caveats, our results show that the traditional theories of IPO underpricing help explain many of the patterns we observe in pricing privatization IPOs. Thus to a significant degree, the investment banking strategies believed to characterize IPOs of private companies in industrial countries may also play a role in the IPO strategies of state-owned-enterprises in both industrial and lesser developed economies.

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Table A1. Conventional Market Variables

Variable	Description	Coefficient
σ_i	Standard deviation of daily market-adjusted returns for stock i over the first one or two months (22 trading days, or 44 trading days)	b_1
R_I	Return on the appropriate national market index over one event month prior to the first trading day of stock I	b_2
$\sigma_{i,RM}$	Standard deviation of daily market returns for stock i over one event month prior to the first trading day of stock i (22 trading days)	b_3
$SIZE_I$	Measure of issue size defined as the natural log of the issue size in US dollars.	b_4
$OECD_i$	OECD dummy variable, equal to one if offering i is from an OECD country, zero otherwise	b_5
$IND_{i,j}$	An industry sector dummy variable if the offering i is by a firm in industry $j, i= 1, … 6$	$b_6, b_7, b_8, b_9, b_{10}, b_{11}$

Table A2. Political Variables

Variable	Description	Coefficient
CD_I	Control Dummy = 1 if allocation sold > 50%, zero otherwise	c_1
B_i	National government budget deficit as % of GDP	c_2
$EMPL_i$	Percentage of shares allocated to employees	c_3
$GINI_i$	Gini coefficient of income inequality	c_4
$FORG_i$	The percentage allocation of shares to foreigners	c_5

Table 1
Summary Information:
Entire Privatization Sample and Sub-Samples

Regions (1)	Total No. of Offers (2)	Issue Proceeds in US dollars (million)				Percentage of Stake Sold by Government		Over-subscription Ratio		Percentage of Offer Allocated Abroad		Percentage of Offer for Employees	
		# of Obs.	Total (3)	Mean (4)	Median (5)	# of Obs.	Mean (%) (6)	# of Obs.	Mean (7)	# of Obs.	Mean (8)	# of Obs.	Mean (9)
Total Sample	**507**	**491**	**352,291**	**717**	**163**	**441**	**39.9%**	**236**	**12.3**	**191**	**39.1%**	**233**	**9.8%**
Panel A: Breakdown between IPOs and Seasoned Offerings													
IPOs	330	321	187,097	583	128	294	47.3%	169	15.1	120	33.3%	190	9.5%
Seasoned Offerings	177	170	165,194	972	213	147	25.1%	67	5.2	71	48.8%	43	11.3%
Panel B: Breakdown between UK and the Rest of the World													
UK	57	56	88,878	1,587	909	57	74.7%	53	7.7	38	23.5%	42	4.7%
Total Non-UK	450	435	263,413	606	133	384	34.7%	183	13.7	153	43.0%	191	11.0%
Panel C: Breakdown between Western Europe and All Other Regions													
Western Europe	255	244	199,806	819	379	222	45.0%	133	5.5	126	36.9%	116	8.0%
Total Non-W. Europe	252	247	152,485	617	70	219	34.7%	103	21.1	65	43.4%	117	11.7%
Panel D: Breakdown between OECD and Non-OECD Countries *													
OECD Countries	298	286	311,299	1,088	379	261	44.9%	145	5.9	139	36.0%	130	8.0%
Non-OECD	205	201	40,338	201	49	177	32.4%	89	23.0	51	46.6%	101	12.2%

* This breakdown excludes 4 issues from Mexico (which joined the OECD in 1994) and Hungary, Poland and South Korea (which joined in 1996).

Table 2
Number of Offerings and Privatization Proceeds by Country

Regions (1)	Country Number (2)	Country (3)	Total Number of Offerings (4)	Number of Offerings with Issue Proceeds (5)	Total Issue Proceeds in US dollars (million) (6)
		Total Sample	**507**	**491**	**352,291**
Western Europe	1	Austria	22	22	4,080
	2	Denmark	5	4	3,748
	3	Finland	13	12	2,367
	4	France	37	37	40,865
	5	Germany	13	10	6,091
	6	Greece	2	2	559
	7	Ireland	6	6	1,132
	8	Italy	17	17	16,825
	9	Netherlands	8	7	10,914
	10	Norway	7	7	1,503
	11	Portugal	27	27	7,030
	12	Spain	13	10	10,654
	13	Sweden	5	5	3,912
	14	Turkey	23	22	1,248
	15	UK	57	56	88,878
North America	16	Canada	23	23	8,926
AustralAsia	17	Australia	9	9	5,019
	18	New Zealand	3	3	1,076
Asia	19	Indonesia	3	3	2,874
	20	Japan	7	7	96,473
	21	Malaysia	13	13	3,771
	22	Pakistan	2	2	1,079
	23	Philippines	5	5	764
	24	Singapore	27	26	5,429
	25	South Korea	5	4	2,465
	26	Taiwan	16	16	4,343
	27	Thailand	8	7	1,055
Mid East & North Africa	28	Egypt	18	18	392
	29	Israel	18	18	2,183
	30	Morocco	8	8	337
Central & Latin America	31	Argentina	9	8	6,160
	32	Brazil	8	8	954
	33	Colombia	2	2	670
	34	Mexico	5	4	4,935
	35	Peru	8	8	107
Africa	36	Ghana	3	3	435
	37	South Africa	2	2	1,301
Eastern Europe	38	Hungary	14	14	646
	39	Poland	36	36	823

Table 3
Number of Offerings and Privatization Proceeds by Industry Sector and by Industry

Industry Sector (1)	Industry (2)	Number of Offerings (3)	Issue Proceeds in US dollars (million)			
			Total (4)	Mean (5)	Median (6)	Maximum (7)
Total Sample		**491**	**352,291**	**717**	**163**	**40,260**
Panel A: By Industry Sector						
1. Infrastructure		146	216,499	1,483	488	40,260
2. Financial Services		106	49,600	468	204	4,810
3. Primary Sector		61	45,111	740	244	8,857
4. Industrial Manufacturing		148	38,416	260	49	3,400
5. Others		30	2,665	89	34	504
Panel B: By Industry						
Infra-structure	1 Telecommunication	39	138,449	3,550	932	40,260
	2 Airlines	19	11,852	624	205	5,170
	Railroad, Road Transport, ports, Shipping, 3 Aerospace	38	18,337	483	57	7,300
	4 Utility	50	47,861	957	700	4,500
Financial Services	5 Banking	84	36,657	436	225	4,810
	6 Insurance	22	12,943	588	176	3,000
Primary Sector	7 Mining	8	1,817	227	170	524
	8 Oil & Petroleum	53	43,294	817	282	8,857
Industrial Manu-facturing	9 General Manufacturing	52	16,082	309	26	3,400
	10 Steel, Metal	40	14,837	371	151	2,904
	11 Chemical, Pharmaceutical	30	6,191	206	46	1,285
	12 Construction, Cement	26	1,306	50	24	228
Others	Media, Radio, 13 Advertising	3	590	197	207	208
	14 Others	27	2,075	77	29	504

Table 4
Initial Returns (Underpricing Effect)
Across Types of Offers and Across Geographic Regions

Regions (1)	Total No. of Offers (2)	Initial Returns for All Offers			Initial Returns For IPOs Only		Initial Returns for Seasoned Offers Only		Two-Sample t-statistic (8)	Significance Level (9)
		No. of Obs.	Mean (3)	Median (4)	Maximum (5)	No. of Obs.	Mean (6)	No. of Obs.	Mean (7)		
Total Sample	**507**	**298**	**25.7%**	**10.0%**	**1250.0%**	**221**	**32.2%**	**77**	**7.17%**	3.7021	99%
Panel A: Breakdown between UK and the Rest of the World											
UK	57	51	15.7%	17.4%	34.1%	41	17.7%	10	7.0%	3.9693	99%
Total Non-UK	450	202	27.8%	8.4%	1250.0%	145	35.6%	57	7.2%	3.0793	95%
Panel B: Breakdown between Western Europe and All Other Regions											
Western Europe	255	169	9.3%	7.7%	40.6%	114	11.2%	55	5.5%	4.3692	99%
Total Non-W. Europe	252	129	47.2%	21.1%	1250.0%	107	54.5%	22	11.4%	3.1284	99%
Panel C: Breakdown Among Geographical Regions											
Western Europe	255	169	9.3%	7.7%	40.6%	114	11.2%	55	5.5%		
North America (Canada)	23	13	3.5%	1.7%	24.0%	8	1.6%	5	6.6%		
AustralAsia	12	12	11.7%	13.8%	25.9%	11	12.0%	1	8.0%		
Asia	85	59	41.5%	33.5%	171.0%	53	44.2%	6	17.3%	3.2502	99%
Mid East & North Africa	44	4	7.0%			1		3	9.3%		
Central & Latin America	32	8	4.9%	2.3%	20.0%	5	8.8%	3	-1.7%		
Eastern Europe	50	32	105.4%	25.5%	1250.0%	28	117.5%	4	20.9%	1.9431	90%

Table 5
Test of Differences in Initial Returns:
Privatization IPOs and Conventional IPOs

Country	Average Initial Return of Our Privatization IPOs		Panel A			Panel B		
	Average Initial Return of Our Privatization IPOs		Average Initial Return of Conventional IPOs		Average Difference of Initial Returns	Average Initial Return of Conventional IPOs		Average Difference of Initial Returns
	No. of Obs. (1)	Mean (2)	No. of Obs. (3)	Mean (4)	(t-stat) (5) = (2) - (4)	No. of Obs. (6)	Mean (7)	(2-sampel t-stat) (8) = (2) - (7)
U.K.	42	17.7%	2,133	12.0% a	5.7% (4.2024) *	184	11.5% d	6.2% (3.0360) *
France	14	9.5%	187	4.2% a	5.3% (1.9129) ***	131	4.0% e	5.5% (1.6399) ***
Germany	5	6.3%	170	10.9% a	-4.6% ** (-2.8757)			
Italy	3	6.4%	75	27.1% a	-20.7% (-2.4460) ***			
Canada	8	1.6%	258	5.4% a	-3.8% (-0.8560)	100	9.3% f	-7.7% (-1.4289) #
Australia	8	10.9%	266	11.9% a	-1.0% (-0.2972)			
Malaysia	10	73.6%	224	75.0% b	-1.4% (-0.1037)	224	75.0% b	-1.4% (-0.0943)
Singapore	26	43.0%	128	31.4% c	11.6% (1.6128) #	128	31.4% c	11.6% (1.4167) #

a: The source is Table 1 in Loughran, Ritter and Rydqvist's (1994) paper. They summarized earlier studies. For countries where more than one set of authors are cited, the combined sample sizes have been constructed. Their sources are as follows. U.K.: Dimson (1979); Levis (1993); the combined sample period is 1959-90. France: Husson and Jacquillat (1990); Leleux and Muzyka (1993); Palliard and Belletante (1992); the combined sample period is 1983-92. Germany: Ljungqvist (1993); the sample period is 1978-92. Italy: Cherubini and Ratti (1992); the sample period is 1985-91. Canada: Jog and Riding (1987); Jog and Srivastava (1993); the combined sample period is 1971-92. Australia: Lee, Taylor and Walter (1993); the sample period is 1976-89.
b: The source is Yong's (1995) paper, the sample period is 1990-94.
c: The source is Lee, Taylor and Walter's (1994) paper, the sample period is 1973-92.
d: The source is Levis' (1993) paper, the sample period is 1980-88.
e: The source is Husson and Jacquillat's (1990) paper, the sample period is 1983-86.
f: The source is Jog and Riding's (1987) paper, the sample period is 1971-83.

*:   Denotes significant at 99%;   **:   Denotes significant at 95%;
***: Denotes significant at 90%;   #:   Denotes significat at 85%.

Table 6
Compare the Underpricing Effect
Between OECD Countries and Non-OECD Countries *

	Initial Returns for All Offers		Initial Returns for IPOs Only	
	OECD Countries (1)	Non-OECD Countries (2)	OECD Countries (3)	Non-OECD Countries (4)
Mean	9.1%	57.8%	10.8%	65.2%
Observation	197	98	135	84
Two sample t-test				
t-stat	-3.3393		-3.2295	
p-val	0.0012		0.0018	

* This breakdown excludes 4 issues from Mexico (which joined the OECD in 1994) and Hungary, Poland and South Korea (which joined in 1996).

Table 7
Tests of Differences in Initial Returns:
Early Privatizations and Later Privatizations

Regions	Country	Total No. of IPO initial Return (1)	Mean of Early IPOs (2)	Mean of Later IPOs (3)	Difference Between the Sub-samples		
					Difference (4)	t-stat (5)	P-val (6)
Western	Austria	9	3.6%	11.6%	-8.0%		
Europe	France	14	10.9%	8.1%	2.8%	0.4878	0.6360
	Germany	5	4.0%	9.6%	-5.6%		
	Turkey	21	6.5%	8.0%	-1.5%	-0.2482	0.8078
	UK	42	17.0%	18.4%	-1.4%	-0.5320	0.5986
North America	Canada	8	6.4%	3.2%	3.2%		
AustralAsia	Australia	8	11.3%	10.5%	0.8%		
Asia	Malaysia	10	65.4%	81.9%	-16.5%	-0.5522	0.5988
	Philippines	4	27.3%	80.4%	-53.1%		
	Singapore	26	44.0%	42.0%	2.0%	0.1321	0.8963
	Thailand	5	6.0%	35.2%	-29.2%		
Latin America	Argentina	5	12.2%	3.8%	8.4%		
East	Hungary	4	45.1%	9.7%	35.4%		
Europe	Poland	24	210.0%	54.0%	156.0%	1.4202	0.1816
Total Sample		218	39.4%	24.5%	15.0%	1.1515	0.2516

Note: P-val in column (6) indicate that the two sample mean differences for each country and for the total sample are not statistically significant at any conventional level.

Table 8
Initial Returns (Underpricing Effect) by Year

Year	Initial Returns for All Offers			Initial Returns for IPOs		
	No. of Obs. (1)	Mean (2)	Median (3)	No. of Obs. (4)	Mean (5)	Median (6)
Total Sample	**298**	**25.7%**	**10.0%**	**221**	**32.2%**	**14.5%**
before1986	28	15.4%	8.5%	19	19.4%	19.0%
1987	15	42.2%	24.0%	15	42.2%	24.0%
1988	8	4.0%	3.4%	7	3.3%	3.1%
1989	28	16.6%	14.8%	20	19.1%	17.1%
1990	33	17.9%	17.5%	30	17.8%	17.5%
1991	35	12.9%	7.6%	31	14.3%	9.2%
1992	28	20.7%	6.6%	18	29.1%	14.8%
1993	39	78.3%	12.0%	25	118.9%	30.5%
1994	49	18.4%	6.8%	33	23.4%	9.1%
1995	22	11.9%	3.3%	18	13.4%	3.3%
Up to Aug. 1996	13	20.5%	8.0%	5	43.6%	19.4%

Table 9 - Panel A
Multivariate Regression Model
To Explain The Short-Run Underpricing

Explanatory Variables	Coeff.	Regression (1)	Regression (2)	Regression (3)	Regression (4)	Regression (5)
No. of Observations	#	155	155	155	155	155
Constant	b_0	0.6629 *	0.5330 *	0.6550 *	0.6455 *	------ a
StdDev	b_1	-0.5700	-0.7174	0.2241	-0.2943	-0.4806
Market Trend - 1month	b_2	0.8922 *	0.9851 *	------	0.8346 *	0.8644 *
StdDev Mkt - 1 month	b_3	-9.5012 **	------	-9.409 *	-7.2563 **	-7.0654 **
Size	b_4	-0.0649 *	-0.0132	-0.0188	-0.0226 ***	-0.0196
OECD	b_5	------	-0.3451 *	-0.3393 *	-0.3360 *	-0.3276 *
Infrastructure-1 (Regulated)	b_6	------	------	------	------	0.6135 *
Infrastructure-2 (non-Regulated)	b_7	------	------	------	------	0.6891 *
Financial	b_8	------	------	------	------	0.5672 *
Primary	b_9	------	------	------	------	0.6086 *
Industrial	b_{10}	------	------	------	------	0.6197 *
Other sectors	b_{11}	------	------	------	------	0.7394 *
R-square		0.3735	0.355	0.3431	0.355	0.3935
F-statistic		17.7644 *	20.6411 *	19.5864 *	20.6411 *	9.3415 *

a: When a dummy variable is assigned to each of five industry sectors, the overall constant is dropped.
*: denotes significant at 99%;
**: denotes significant at 95%;
***:   denotes significant at 90%. # denotes significant at 85%.

Table 9 - Panel B
Multivariate Regression Model
To Explain The Short-Run Underpricing

Explanatory Variables	Coeff.	Regression (6)	Regression (7)	Regression (8)	Regression (9)	Regression (10)	Regression (11)	Regression (12)
No. of Observations	#	140	140	133	63	57	55	55
Constant	b_0	-0.0022	0.4565 **	0.7674 *	0.5616 *	0.0739	0.056	-0.8041 *
StdDev	b_1	-0.8446 **	-0.37	-0.5167	8.6097 **	7.1275	7.0748 #	------
Market Trend - 1month	b_2	0.9397 *	0.7523 **	0.6557 *	1.9538 *	1.8706 *	1.8389 *	------
StdDev Mkt - 1 month	b_3	-12.3062 *	-10.2042 *	-5.7934 ***	-12.8732 **	-14.5823 **	-14.0511 *	------
Size	b_4	-0.0384 *	-0.0157	-0.034 *	0.0053	0.0059	0.0068	------
OECD	b_5	------	-0.3377 *	-0.4117 *	-0.5038 *	-0.4245 *	-0.4355 *	------
Infrastructure-1 (Regulated)	b_6	------	------	------	------	------	------	------
Infrastructure-2 (non-Regulated)	b_7	------	------	------	------	------	------	------
Financial	b_8	------	------	------	------	------	------	------
Primary	b_9	------	------	------	------	------	------	------
Industrial	b_{10}	------	------	------	------	------	------	------
Other sectors	b_{11}	------	------	------	------	------	------	------
>50% privatized dummy	c_1	------	------	0.0686 #	------	------	0.0213	-0.0005
Govt Deficit	c_2	0.0053	-0.0071	------	------	-0.0062	-0.0076	0.0299 *
Employee % Allocation	c_3	------	------	------	0.1389	0.4341	0.5066	1.1007 #
Gini Coefficient	c_4	0.0158 *	0.0052	------	------	0.013 *	0.0129 *	-0.0055
Foreign % Allocation	c_5	------	------	------	-0.0908	-0.0781	-0.0648	-0.05
R-square		0.2684	0.3814	0.4167	0.7325	0.7766	0.7809	0.3611
F-statistic		8.1308 *	11.6248 *	15.0042 *	21.517 *	18.1516 *	15.6799 *	5.5385 *

Note: In these regressions, we use the relative size variable as an explanatory variable.
 *: denotes significant at 99%;
 **: denotes significant at 95%;
 ***: denotes significant at 90%. # denotes significant at 85%.