

Otchere, Isaac

**Working Paper**

## Intra-industry effects of privatization announcements: Evidence from developed and developing countries

Nota di Lavoro, No. 112.2002

**Provided in Cooperation with:**

Fondazione Eni Enrico Mattei (FEEM)

*Suggested Citation:* Otchere, Isaac (2002) : Intra-industry effects of privatization announcements: Evidence from developed and developing countries, Nota di Lavoro, No. 112.2002, Fondazione Eni Enrico Mattei (FEEM), Milano

This Version is available at:

<https://hdl.handle.net/10419/119720>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

Fondazione Eni Enrico Mattei

**Intra-Industry Effects of  
Privatization Announcements:  
Evidence from Developed and  
Developing Countries**

Isaac Otchere

NOTA DI LAVORO 112.2002

**DECEMBER 2002**

PRIV – Privatisation, Regulation, Antitrust

Isaac Otchere, *Department of Finance, University of Melbourne*

This paper can be downloaded without charge at:

The Fondazione Eni Enrico Mattei Note di Lavoro Series Index:

[http://www.feem.it/web/attiv/\\_wp.html](http://www.feem.it/web/attiv/_wp.html)

Social Science Research Network Electronic Paper Collection:

[http://papers.ssrn.com/abstract\\_id=XXXXXX](http://papers.ssrn.com/abstract_id=XXXXXX)

The opinions expressed in this paper do not necessarily reflect the position of  
Fondazione Eni Enrico Mattei

# Intra-Industry Effects of Privatization Announcements: Evidence from Developed and Developing Countries

## Summary

We examine the stock price reaction of rival firms to privatization announcements to infer information about industry effects of privatization. We find that the rival firms reacted negatively to privatization announcements, thus suggesting that the announcement effects reflect competitive considerations rather than positive industry-wide effects. In comparison, we find that the adverse reaction of the rival firms to privatization announcements in developing countries is stronger than that in the developed countries. Interestingly also, we find that full privatization announcements generate larger negative abnormal returns for rival firms than partial privatization announcements where the firm gains only partial autonomy from the government. We present some, albeit weak evidence that the rival firms' reaction to privatization announcement is increasing in the degree of government ownership of the privatized firm. Thus as the proportion of government ownership reduces, subsequent partial privatization elicits stronger market reaction from rival firms. We further demonstrate that the negative abnormal returns earned by shareholders of the rival firms' are not due to price pressure effects.

**Keywords:** Privatization, rival firms' reaction, developed and emerging capital markets, price pressure

**JEL:** G21, G32, G14, L33

*The author thanks William Megginson, François Degeorge, Jean-Claude Cosset, Enrico Perotti, Bernardo Bortolotti, Scott Wallsten, Alexander Dyck, Thomas Gehrig and participants at the 2002 FEEM Conference on Privatization, Corporate Governance and Financial Markets Development and the 2002 Northern Finance Association Meeting in Banff, Canada. The financial support of the Faculty of Economics and Commerce of the University of Melbourne is acknowledged. Kunal Panchal, Edwina Ip and Mary Hou He provided excellent research assistance. All errors remain the author's responsibility.*

*Address for correspondence:*

Isaac Otchere  
Department of Finance  
University of Melbourne  
Parkville, 3010  
Australia  
Phone: (61) 3 8344-7166  
Fax: (61) 3 8344-6914  
E-mail: [iko@unimelb.edu.au](mailto:iko@unimelb.edu.au)

## **Intra-Industry Effects of Privatization Announcements: Evidence from Developed and Developing Countries.**

### **I Introduction**

It is well documented that state owned enterprises (SOEs) are inefficient as compared to their private counterparts (see for example, Boycko, M., A. Shleifer and R. W. Vishny, 1996). The poor performance has, inter alia, been attributed to the use of state enterprises to realize social and political goals that involve wealth redistribution rather than wealth creation (Krueger, 1999) and the lack of managerial incentives for better performance. Prior empirical studies show that privatization (especially share issue privatization) improves operating performance because the new competitive environment and the monitoring role of the stock market drive managers towards efficiency and profitability objectives.<sup>1</sup> As a result of these redeeming features, privatization has become a notable tool for restructuring former state-owned enterprises in the past two decades. Governments of all persuasions in both developed and developing countries have privatized state-owned enterprises through the issue of shares to the public.

Privatization occurs partly because governments want to improve the efficiency and competitiveness of the privatized firms by exposing them to market forces and competition.<sup>2</sup> The trading of the firms' shares on the stock market and the attendant monitoring of the firms' performance by various stakeholders, and the disciplinary nature of the market for corporate control make the managers of the privatized firms more accountable to shareholders. Faced

---

<sup>1</sup> For example, Boardman and Vining (1989), Galal, Jones, Tandon, and Vogelsang (1994), Megginson, Nash, van Randenborgh (1994), and Boubakri and Cosset (1998) show that privatized firms increase sales, capital investment, operating efficiency and profitability in the post privatization period.

<sup>2</sup> See Megginson and Netter (1998) and Verbrugge, Megginson, and Lee (1999) for a discussion of the popularity of share issue privatization.

with these pressures, the newly privatized firm may become more efficient and aggressive in its operations.

While there is a large amount of empirical research that shows that privatization improves the performance of privatized firms (see Megginson and Netter 1998 for a survey of this literature), less attention has been paid to questions concerning the impact of privatization on industry counterparts. In this paper, we build on prior studies by focusing on the valuation effects of privatization announcements on rival firms. This issue is important because if privatization creates a competitive environment and incentives for better performance for the privatized firms, as has been documented by Megginson, Nash, van Randenborgh (1994), Boubakri and Cosset (1998) and D'Souza, Megginson and Nash (2000), then a more efficient competitor will appear in the industry as the privatization process releases the former SOE from the control and interference of the government. The privatization of state enterprises could thus hurt rival firms through increased competition from the newly privatized firm that, by virtue of its hitherto monopoly position, may have immense competitive advantage and market power. Competitors could suffer due to the presence of a reinvigorated, more aggressive and a more efficient rival. The rival firms' stock price would react negatively to privatization announcements if the market believes that there is going to be a more efficient and aggressive competitor in the industry whose operations can possibly lead to fall in product prices and, hence, erode the profitability of competitors.

Alternatively, it is possible that following privatization, all firms may be operating on an equal playing field, with the hitherto non-competitive incentives that the former monopoly used to enjoy such as subsidies taken away or now being enjoyed by the other firms in the industry. In fact, the presence of a newly privatized firm could even spur the rival firms to

become more competitive. Moreover, the privatization could bode well for the whole industry if for example it results in the relaxation of restrictions and rules of operations. These changes may unlock growth opportunities for the whole industry. The privatization announcement could thus send positive information about the future prospects of the whole industry rather than negative competitive effects on the rival firms.

The purpose of this paper is to examine the intra-industry effects of privatization announcements by analyzing the short-run stock price reaction of rival firms to the privatization announcement. This study is the first to examine the effects of privatization on competitors' stock price in a large sample. The only other studies that examine rival firms' reaction to privatization announcements are Eckel, Eckel, and Singal (1997) and Otchere and Chan (2002) that examine the impact of the announcement of the privatization of British Airways and the Commonwealth Bank of Australia respectively on rivals firms. The extent to which the results of such single-industry single-announcement studies can be generalized is limited. We contribute to the literature by analyzing the reaction of a comprehensive sample of 314 rival firms to 121 share issue privatization announcements from 29 countries and 28 industries. We accomplish this objective by, *inter alia*, examining the differential reaction of rival firms to privatization announcement in developed and developing countries, in competitive and non-competitive industries and their reaction to full and partial privatization announcements. Such a comprehensive analysis of intra-industry effects of privatization announcements will contribute to our understanding of how investors use the information contained in privatization announcements to reassess the value of industry counterparts. The results will also be beneficial to policy makers, privatization consultants and governments

contemplating privatization of state enterprise, as well as individual and institutional investors.

We first examined the stock price reaction of the rival firms to the privatization announcements to infer information about the expected impact of privatization on industry counterparts. Consistent with the premise that privatization could hurt competitors, we find that the rival firms reacted negatively to the privatization announcements. On the announcement day, the rival firms lost 0.54% ( $p$ -value=0.004) of their value. For the 3-days (5-days) surrounding the privatization announcement day, the firms lost 0.43% (0.57%) of their value. We conclude that the rival firms' reaction following the privatization announcements reflect the market's concern about the potential competitive effects of privatization on the rival firms.

Having established that rival firms reacted negatively to the privatization announcements, we then examined the differential effects of privatization on rival firms in developed and developing capital markets. Prior studies suggest that the benefits of capital market monitoring to privatized firms depend on the level of sophistication of the capital market. In developing countries, privatized firms may face less market monitoring as shareholders are likely to have less access to information as well as lack the power to sanction managerial performance. In that case, privatization may offer little efficiency gains and performance improvements. The announcement effects of privatization on rival firms in developing countries may thus not be as strong as those in developed capital markets. Contrary to this assertion however, we find that the reaction of rival firms is stronger in developing countries than in developed countries. For the 3-days surrounding the announcement date, the rival firms in emerging markets lost 0.63% of their wealth while

those in the developed capital markets lost (albeit insignificant) 0.27% of their value. If investors' expectations about privatization can be inferred from the rival firms' stock price reaction, then this result implies that the privatized firms are likely to be more efficient and competitive in developing countries than in developed countries. This assertion finds support in recent studies by Boubakri and Cosset (1998) and D'Souza, Megginson and Nash (2000) who document stronger performance improvement for privatized firms in developing countries.

Interestingly also, we find that the magnitude of the rival firms' reaction to full privatization announcement is greater than that of partial privatization. On the announcement day, the rivals of fully privatized firms lost 1.25% of their wealth while rivals of firms that were partially privatized lost 0.43% of their wealth. Also, the rival firms' reaction to partial privatization is somewhat negatively related to the degree of privatization. As the proportion of government ownership reduces, subsequent partial privatization generates stronger negative reaction from the rival firms. We also examine the possibility that the negative abnormal returns earned by the rival firms are due to price pressure effects resulting from portfolio rebalancing and index changes, but the results show that price pressure hypothesis does not account for the negative abnormal returns experienced by the rival firms.

The remainder of the paper is organized as follows: Section II presents a discussion of the effects of privatization on competitors stock price and our other testable hypotheses. Section III deals with the data and methodology. The results are presented and analyzed in Section IV. In section V, we examine alternative explanations for our results. Section VI concludes the study.



## **II Background**

### **A Effects of privatization on competitors' stock price**

The theoretical literature on privatization identifies two main types of problems associated with government ownership, namely political and managerial incentive problems. The political problem proposed by Shleifer and Vishny (1994) suggests that political interference from governments distorts the objectives of state enterprises. Governments use state enterprises to pursue multiple and sometimes conflicting objectives, such as welfare maximization, at the expense of profit maximization. The managerial incentive problem discussed by Vickers and Yarrow (1989) also suggests that poor or the lack of monitoring leads to low powered incentives on the part of managers to improve performance.

Prior empirical studies however show that privatization brings about a change in the firm's objectives as well as a change in the owners and managers' incentives that often result in a more focused and efficient organization (Megginson et al (1994) and D'Souza, Megginson and Nash (2000)). The public trading of the firm's shares facilitates the adoption of market oriented compensation plans as management compensation can be tied to the firm's stock price. This creates incentives for management to perform better and to create value for shareholders. The pressures of product market competition may also compel the newly privatized firms to operate more efficiently, aggressively and competitively if they are to survive in the post privatization environment. This rejuvenation can affect the rival firms' performance. A feature of most privatized firms is that under state ownership, the firms had market power but had to endure pressures from the government in relation to their pricing and investment decisions. Following privatization however, most privatized firms usually retain a significant market power and continue to operate in a quasi monopoly position (on account of their market share and market power) while being relieved of the requirement to follow

government directives designed to promote social aims. The privatized firms may be able to exploit this market power to their advantage to increase profitability. They could become a stronger competitive force for the rival firms in the industry because of their dominant position in the product market and this advantage can translate into above average performance.

The fundamental basis of above average performance in the long run is (sustainable) competitive advantage that the privatized firms, by virtue of their previous monopoly status, may have over rivals. Their dominance in the market through control over access to infrastructure will give them a competitive advantage. Their competitive advantage over rivals may also lie in their cost leadership. The source of the cost advantage may include pursuit of economies of scale, proprietary technology and especially preferential access to infrastructure. This can help the newly privatized firms to achieve and sustain overall cost leadership that can translate into strong competitive advantage over rivals. The intensity of competition influences prices as well as the cost of competing in such areas as product development, advertising and sales force. The pricing behavior of such a large competitor could negatively affect the profitability of rival firms. The privatized firms, with their significant market power, could realize greater post privatization gains at the expense of their rivals. The privatization of a hitherto SOE could thus hurt rivals through increased competition as rival firms may be forced to discount prices well below those of the privatized firm to gain market share. From this perspective, the privatization announcement may send an unfavorable signal about the effects of increased level of competition on the rival firms. Thus if the market believes that as a result of the privatization there is now a rejuvenated, more efficient and aggressive competitor in the industry whose operations can lead to falls in

product prices, and hence erode the profitability of the rival, the rival firms' stock prices will react negatively to the announcement of the privatization. Eckel, Eckel, and Singal (1997) argue that the stock market's expectation of the efficiency of the privatized firm can be inferred from the rival firms' stock price effects following the privatization announcement.

On the other hand, as a result of the privatization all firms may enjoy the same benefits as the newly privatized firms and may face a more liberal regulatory regime, which may in turn enhance the growth prospects of the industry. The privatization announcement could thus send positive information about the future prospects of the industry rather than negative competitive effects on the rival firms. We analyze the share price effects of the privatization announcements on rival firms with a view to ascertaining the valuation effects of the information contained in the privatization announcements. If the announcement contains unfavorable information that indicates a stronger competitive position for the privatized firms, the share price of rival firms should fall. On the other hand, if the privatization is good news for the industry, we should expect positive valuation effects on industry rivals.

## **B Other Testable Hypotheses**

### **1 Rival firms' reaction to privatization announcements in developed and developing capital markets**

One of the causes of the poor performance of SOEs is the lack of scrutiny from different stakeholders. The trading of the firms' shares following privatization and the attendant monitoring of the firms' performance, together with the linking of managers' remuneration to stock market performance, could spur management to become more efficient, productive and accountable. Megginson, Nash, van Randenborgh (1994), Boubakri and Cosset (1998) and D'Souza, Megginson and Nash (2000) suggest that capital market monitoring that

accompanies privatization triggers improvements in performance, but Holstrom and Tirole (1995) argue that the benefits from capital market monitoring depends on the level of sophistication of the market and the intensity of the monitoring. A well-developed and active capital market allows the newly privatized firms greater access to capital needed to finance profitable projects. Such markets are also likely to be informationally efficient. Subrahmanyam and Titman (1999) argue that the presence of newly publicly traded firms in an industry can attract more information gathering about the industry, thus making the prices of all firms in the industry more efficiently priced. However, in developing countries where information gathering may be inefficient and costly, firms may not be efficiently priced.

The foregoing discussion suggests that privatization may not offer as much efficiency gains and performance improvements for privatized firms in developing countries as it would in developed capital markets because firms may face less market monitoring since the shareholders would have less access to information as well as lack the power to sanction managerial performance. Consequently, in developing countries, the privatized firm may not be as aggressive and competitive as they would in developed countries, and hence the magnitude of the rival firms' reaction to privatization announcements in developing countries may be less than that in developed countries. Alternatively, it is possible that the rival firms' reaction to privatization announcements in emerging market where information flow may not be efficient and where stocks may attract less attention from market participants could be greater than that determined by fundamentals. We contribute to the literature on the effects of privatization in developed and developing countries by examining the rival firms' differential reaction to privatization announcements in these economies.

## **2 Rival firms' reaction to privatization announcements in competitive and non-competitive industries**

Prior studies including D'Souza, Megginson and Nash (2000), Megginson, Nash, van Randenborgh (1994) and LaPorta and Lopez-de-Silanes (1999) find that efficiency gains are greater for firms that operate in competitive markets than those in non-competitive markets. Boardman and Laurin (1996) also argue that privatized firms such as utilities that operate in non-competitive markets and are not subject to the discipline of competitive pressures would be less likely to benefit from privatization. Given their market dominance and near monopoly status, the privatized firms operating in non-competitive sectors may not have the incentives to restructure and aggressively pursue profitability goals. This argument suggests that the competitive effects of privatization and therefore the rival firms' reaction to privatization announcements will be less in non-competitive industries than in competitive sectors.

Alternatively, we submit that privatized firm in non-competitive industries such as telecommunication and utilities may control the product market through their ownership of the infrastructure and large market share. The rival firms operating in these industries that have to depend on the former monopoly for access to infrastructure could suffer greatly from increased competition, especially if in the case of public utilities the privatized firm owns the generating, transmission and retail components of the business. Similarly, for privatized telecoms, if the telecommunication network is not separated from the retail division (which is usually the case), the network pricing power of the privatized firm will impact negatively on rival firms. This anti-competitive configuration will make the position of the privatized firms in these industries similar to that of a trucking company that owns the majority of the nation's

highways and charges its competitors for access.<sup>3</sup> In competitive industries however, all firms may be operating on an equal playing field following privatization, with the hitherto non-competitive incentives that the former monopoly used to enjoy such as subsidies taken away or now being enjoyed by the rival firms, privatization may benefit all the industry counterparts. Also, the presence of a new and rejuvenated privatized firm in competitive industries could even spur the rival firms to become more competitive and aggressive, in which case the rival firms may not be negatively affected by the privatization. We test the conjecture that the reaction of rival firms to privatization announcement in competitive industries is significantly different from that of the rivals in a non-competitive environment.<sup>4</sup>

### **3 Rival firms' differential reaction to partial and full privatization announcements**

Privatization often leads to a change in the goals of the firm, with the privatized firm usually focusing on profit maximization, efficiency and shareholder value creation. However, the degree to which these goals can be achieved depends on whether or not the government fully privatizes the enterprise. Continued government ownership in a privatized firm may hinder the managers' ability to restructure the firm since the government may continue to interfere with the firm's operations. This is likely to be the case if the partially privatized firm decides to pursue economically profitable but politically unpopular investment decisions such as reducing staff levels and closing down unprofitable divisions that may be located in politically sensitive constituencies. If efficiency and competitive considerations were the reasons for the

---

<sup>3</sup> Brian Toohey (2002) has described Telstra, a partially privatized telecommunication firm in Australia, as fitting this characterization.

<sup>4</sup> We define non-competitive industries as telecommunication, banks and utilities (water and electricity) and all others as competitive industries.

privatization, then partial and full privatization would have different valuation effects on rival firms given that the partially privatized firm will have little autonomy in pursuing its goals.

Prior studies including Boardman and Vining (1989) and Boycko, Shleifer and Vishny (1996) suggest that in order to facilitate the restructuring of state enterprises, both cash flow and control rights should pass from governments to private hands, i.e. the firm should be fully privatized. Boubakri and Cosset (1998) find that increases in profitability and efficiency were significantly larger for control privatization (in which governments fully surrender voting control) than for revenue privatization (in which governments sell a minority ownership stake but do not surrender voting control). This suggests that partial privatization may not achieve the desired effects of improving the profitability and efficiency of the former SOEs, given that the firms may still be controlled by the state. Thus, if corporate governance is a factor in enhancing the efficiency and competitiveness of the privatized firm, then greater efficiency and competitive gains would be associated with full privatization than partial privatization as a partially privatized firm may not be as competitive and aggressive as a fully privatized one. We test whether government ownership of the privatized firm determines the valuation effects of privatization announcement on the rival firms. We hypothesize that the rival firms' reaction to full privatization announcement is greater than that associated with partial privatization announcement.

### **III Data and Research Design**

The data used in this study come from a variety of sources. The initial sample of privatized firms consisting of privatizations that occurred between 1981 and 2000 comes from the appendix to Jones, Megginson, Nash and Netter (1999). This is supplemented by data from Megginson (2000). We identify the privatization announcement dates from Reuters news

service archives. The stock price data come from Datastream International database and Bloomberg database. To be included in the study, we require that the privatization announcement date and stock price data are available in the aforementioned sources. The privatized firm should also have rival firms in the same industry and the same country at the time of the announcement. Some of the privatized firms in the aforementioned sources were not included in the study because we could not identify the announcement dates from Reuters database or there were no stock price data or there were no rivals. For 121 share issue privatizations, we were able to obtain the necessary data.<sup>5</sup> The rival firms were selected on the basis of their industry (2-digit SIC) category and market capitalization. To keep the data collection task manageable, we selected at most six rivals per privatization. In cases where there were less than 6 rivals, we included all of them in the study without imposing any constraint. Where there were more than 6 industry rivals, we included rivals that had market capitalization in the range of 80%-120% that is closest to that of the privatized firm a month after the privatization. The final sample comprises 121 share issue privatizations and 314 rival firms from 29 countries in 28 industries.

**[Fix Table 1 here]**

Table 1 presents the distribution of the privatized firms and their rivals. Panel A shows the spread of the sample firms in developed countries, Panel B shows the same for developing countries while Panels C and D show the breakdown of the sample firms into non competitive and competitive categories respectively. Fifty seven percent of the privatized firms are from developed markets and the rest are from emerging markets. India has the largest number of

---

<sup>5</sup> We analyzed the effects of announcements that led to the privatizations of the SOE but not the announcements relating to privatization intentions that did not materialize.



privatized firms (12), followed by France (11) and the UK, Canada, Spain and China have 8 apiece. About 40% of the privatized firms are in non-competitive industries while 11% are resource companies. The remaining firms are in different manufacturing and transport service industries.

Stock price reaction is measured by calculating the abnormal returns around the privatization announcement date. For the rival firms, we calculate abnormal returns using the market model.<sup>6</sup> Designating the announcement date as day 0, we estimated the regression parameters using 200 observations prior to day -21. The regression parameters, together with the returns on the market indices of the respective countries were used to calculate expected returns. Abnormal returns were calculated as the difference between the observed returns and the expected returns. The abnormal returns were averaged across the sample for each day to obtain the daily average abnormal returns. These returns were then cumulated over different event windows from day -20 to day +20.

For the privatized firms, we calculated returns in two ways. For the initial privatization announcement, we calculated returns for the 20-day period following the initial public offering (since the firms did not have prior period data) as the change in stock price. For subsequent privatization announcements, we calculated abnormal returns employing the same procedure used to calculate the rival firms' abnormal returns.<sup>7</sup> In both cases, we also estimate industry-adjusted abnormal returns for the privatized firms as the difference between the returns of each privatized firm and the returns on an equally weighted portfolio of the rivals of the privatized firm. These industry-adjusted returns were then averaged across the privatized

---

<sup>6</sup> We use the Dimson's adjustment procedure to correct for non-synchronous trading.

<sup>7</sup> For the purpose of determining whether price pressure hypothesis explains our results, we also calculate cumulative abnormal returns for different windows from day 1 to day 60.

firms for each day of the event period and also cumulated over different event windows. The industry-adjusted returns are a better measure of performance because they control for industry events that are unrelated to the privatization. In all cases, we test the significance of the reaction by dividing the abnormal returns by their standard errors. We also employ the proportion test to examine whether the percentage of firms experiencing a change in a specified direction is greater than 50%.

#### **IV Results**

##### **A Main Results**

Our primary objective is to analyze the share price effects of the privatization announcements on rival firms with a view to ascertaining the valuation effects of the information contained in the privatization announcements. We conjecture that if the announcement contains unfavorable information that indicates a stronger competitive position for the privatized firms, the share price of rival firms should fall. On the other hand, if the privatization is good news for the industry, we should expect positive valuation effects on industry rivals. The abnormal returns realized by the rival firms around the time of the privatization announcements are presented in Table 2. The results shown in Panel A are the daily abnormal returns while those in Panel B are the cumulative abnormal returns for different event windows surrounding the announcement day. Consistent with the assertion that privatization could hurt rival firms, we find that our sample of 314 rival firms reacted negatively to the privatization announcements. The shareholders of the rival firms earned small but significant abnormal returns of  $-0.54\%$  ( $t$ -statistic =  $-2.93$ ) on the announcement day. However, the pre and post-announcement period returns are normal except day  $-10$  where we observe significantly negative abnormal returns of  $-0.40\%$

Also, in general, over 50% of the rival firms earned negative abnormal returns on or before the announcement day, with 57% of them experiencing negative abnormal returns on day  $-2$ . From Panel B, we also document negative cumulative abnormal returns for all the event windows around the announcement date. For the 3-day period surrounding the privatization announcement date, the shareholders of the rival firms lost 0.43% of their wealth ( $p$ -value = 0.086). The negative abnormal returns indicate that the rival firms' reaction to the privatization announcements reflects competitive considerations rather than positive industry effects.

[Fix table 2 here]

### **B Rival firms' reaction to privatization announcements in developed and developing capital markets**

Prior studies suggest that privatization in less developed capital markets may offer little efficiency gains and performance improvements because the privatized firms may face less market monitoring. This suggests that privatization announcements in developing countries may not elicit strongly negative reaction from rival firms as they would in developed markets. We test this conjecture by examining the rival firms' reaction to privatization announcements in developed and emerging markets and present the results in Table 3. We find that while shareholders of rival firms in both the developed and emerging capital markets earned statistically significant abnormal returns of  $-0.52\%$  and  $-0.56\%$  respectively on the announcement day, the difference is not statistically significant. However, we document significantly negative abnormal returns of  $-0.38\%$  ( $-0.35\%$ ) two (five) days before the privatization announcement day for the emerging market rivals. No such pre announcement information effect is observed for rival firms in the developed markets. The pre

announcement abnormal returns documented for the emerging markets sample could be due to the leakage of information relating to the privatization announcement.

Also, we note that a higher percentage of rival firms in the developing countries reacted negatively to the privatization announcement than in the developed countries especially in the two days leading up to the privatization announcement. Similarly, we document negatively large cumulative abnormal returns for the rival firms in emerging markets during most of the event windows. For the 3-days (21-days) surrounding the announcement date, shareholders of the rival firms in emerging markets lost 0.63% (2.30%) of their wealth, while the rivals of privatized firms in the developed markets earned, albeit, insignificant returns of -0.27% (-0.22%). The small size of the rival firms' reaction to privatization announcements in developed countries could be due to the fact that information is readily available in these countries that enables investors to correctly evaluate the impact of the privatization on the rival firms. However, if the expected impact of privatization on the performance of the privatized firm can be inferred from the rival firms' stock price reaction, then our results support the hypothesis that investors expected the privatized firms in emerging markets to perform better than those in the developed markets. In fact, Boubakri and Cosset (1998) and D'Souza, Megginson and Nash (2000) find evidence of stronger performance improvements for privatized firms in developing countries than in developed countries. Thus our study provides additional evidence on the differential effect of privatization from a different perspective.

**[Fix table 3 here]**

### **C Rival firms' reaction to privatization announcements in competitive and non-competitive industries**

We conjecture that privatized firms operating in non-competitive sectors may not have the incentive to restructure and aggressively pursue business. Hence, the competitive effects of privatization, and therefore the rival firms' adverse reaction to the privatization announcement will be less in non-competitive industries than in competitive sectors. Alternatively, we submit that privatized firms operating in non-competitive sectors may dominate the product market through their ownership of the infrastructure and this may give them an advantage over competitors who may have to depend on the infrastructure of the former monopolies for business. The competitive position of the rival firms in the non-competitive industries could thus be severely hampered. We present the abnormal returns earned by the rivals of privatized firms in competitive and non-competitive industries in Panel A of table 4. We find that while shareholders of both sub-samples earned significantly negative abnormal returns on the announcement day, the magnitude of the cumulative abnormal returns, together with the significance level, is generally larger for the rivals of privatized firms in competitive industries than that in non-competitive sectors. For example, the 5-day (21-day) cumulative abnormal returns of the rivals of firms privatized in competitive sectors are -0.67% (-1.28%), while those of the rivals in non-competitive sectors are -0.46% (-0.91%). But as the results in columns 8 to 10 show, the cumulative abnormal returns are statistically identical except for the day -20 to 20 period.

**[Fix table 4 here]**

The lack of significant difference between the rivals' reaction to privatization in competitive and non-competitive industries may reflect the fact that sometimes governments usually put these firms through a corporatization phase, a period in which the firm is allowed to operate

as a profit centre. Thus, the new management team of the privatized firm in a non-competitive industry may not have much scope to realize unexploited monopoly rent anymore than what those in competitive sectors can realize. In that case, the rivals' reaction to privatization announcement in competitive and non-competitive industries could be insignificantly different. This assertion finds some support in the predictions of a recent theoretical model developed by Errunza and Mazumdar (2000) and the empirical evidence documented by Megginson, Nash, van Randenborgh (1994) and Boubakri and Cosset (1998) who find no difference in efficiency gains for privatized firms in competitive and non-competitive markets.<sup>8</sup>

We recognize however, that the rival firms' reaction to privatization announcements in the non-competitive sectors may be different for the three sectors we analyze in this study. For some hitherto government monopolies that may continue to dominate the product market, privatization may bode ill for the rival firms. As a result of their market power and dominance, the privatized firms that operate in certain 'noncompetitive' markets may not have the incentives to restructure since they may not face any credible competition that can threaten their position. Their dominance of the product market in terms of their access/ownership of the infrastructure may however give them an advantage over competitors that may have to depend on the infrastructure of the former monopolies. As mentioned above, the pricing behavior of the privatized firm could be akin to a trucking company that owns a

---

<sup>8</sup> Errunza and Mazumdar (2000) show that SOEs that were better managed prior to privatization and have fully exploited any monopoly power in the product market and those that would be handicapped with bureaucratic tendencies would be less attractive to investors and this is likely to be acute in non-competitive industries. On the other hand, if the SOE operated competitively even in government hands, then the anticipated gains after privatization would be small. Thus, there could be an insignificant difference between the post privatization efficiency gains across competitive and non-competitive sectors. This implies that the rival firms' adverse reaction to privatization announcement in competitive and non-competitive sectors would not be significantly different.

nation's road network and charges other competitors for access. This is particularly the case for the telecommunication and utility sectors where the newly privatized firm may own the telephone network and may have to lease it to rivals in the industry.

We present results in support of this argument in Panel B of Table 4. We find that the negative abnormal returns of the rivals of privatized firms in non-competitive sectors are driven by the telecommunication and utilities sectors. For the rival banks, privatization appears to be good news since the shareholders of the rival banks earned positive, albeit insignificant, abnormal returns. However, for the telecommunication and utilities sectors, the rival firms' shareholders lost 2.65% and 1.53% of their wealth respectively on the announcement day, although that of the utilities is not statistically significant. Similarly, while only 48% of rival banks experienced negative abnormal returns on the announcement day, 67% of rival telecommunication firms and 78% of rival utilities experienced negative abnormal returns. The cumulative abnormal returns are not statistically significant, except the 5-day returns of -3.70% (t-statistic is 2.02) for the rivals of privatized utilities that are significant at 10%.<sup>9</sup> The sign, magnitude and significance of the rival firms' reaction to privatization announcements in the telecommunication and utilities sectors suggest that the loss in share price reflects competitive considerations. The evidence supports the conjecture that for non-competitive industries where the incumbent firms may continue to dominate the product market, the privatization may hurt the rival firms that may have to depend on the former monopoly for access to infrastructure.

---

<sup>9</sup> The results for the rival firms in the utilities sector should be interpreted with caution because of the small sample size.

## **D Degree of privatization and rival firms' reaction**

### **1) Rival firms' reaction to full and partial privatization announcement**

Partial privatization may not achieve the intended objective of improving efficiency of the enterprise because the continued state ownership may hinder the effective operations of the firm. A fully privatized firm, on the other hand, will be willing to restructure and become more aggressive and competitive in its operations than a partially privatized firm. D'Souza, Megginson and Nash (2000) suggest that privatization that generates the largest amount of private ownership will experience the greatest performance improvements. We conjecture that rival firms will react differently to the degree of privatization, with full privatization eliciting the strongest adverse reaction from rival firms. Panel A of Table 5 shows the rival firms' reaction to full and partial privatization announcements. We find that for both types of privatizations, the announcements elicited negative stock price reaction from the rivals on the announcement day. Interestingly however, privatizations where government ownership is completely eliminated generate larger negative abnormal returns for rivals than partial privatization. The announcement day abnormal returns accruing to rivals of firms that were fully privatized is  $-1.25\%$  while the returns of rivals of firms that were partially privatized are  $-0.43\%$ .

**[Fix table 5 here]**

For partial privatization, the rival firms reacted positively on days 1 and 2, thus generating significantly positive cumulative abnormal returns around the announcement day. For the 5-day ( $CAR_{(-2,2)}$ ) event window, the rivals of fully privatized firms earned a return of  $-0.84\%$  but rivals of firms that were partially privatized earned a positive return of  $0.73\%$ , thus generating a significantly different cumulative abnormal return of  $1.56\%$ . The results suggest



that the shareholders of the rival firms would benefit from the continued government ownership of the partially privatized firm. If the market's expectation of the efficiency and competitiveness of the privatized firms can be inferred from the competitors' stock price effects, then the rival firms' results are consistent with the argument that the partially privatized firm would be less efficient and competitive than fully privatized firms. Since the government still controls the partially privatized firms, and may use them to pursue social objectives, we find that the rival firms' reaction to partial privatization announcement is not as strong as that of full privatization where governments have completely surrendered control and cash flow rights. The pattern of returns we have documented for the rival firms suggests that partial privatization will impact less on rival firms than full privatization.

**2) Did the first privatization announcement generate significantly greater reaction than subsequent privatization announcements?**

The rival firms' reaction to privatization announcements could depend on whether the privatization is part of a continuing program of sell off or it is a one-off transaction. If the market perceives that the government is embarking on a privatization program that entails the gradual sale of the SOE, then the valuation effects of the initial and subsequent privatization announcement on the rival firms' stock price could be different. For privatizations that occur in tranches, the market may learn from the first announcement and since investors would expect further announcements to follow, the initial privatization announcement is likely to contain more surprise and therefore elicit stronger reaction from rival firms than subsequent partial privatization announcements.

Alternatively, as the proportion of government ownership reduces in subsequent partial privatization announcements, the privatized firm may become more efficient. Thus the

rival firms could react more strongly to the privatization announcement. To test these arguments, we examine the rival firms' reaction to the first and subsequent privatization announcements. The results presented in Panel B of Table 5 generally support the learning effect argument. We find that although the magnitude of the rival firms' announcement day abnormal returns for the first privatization is smaller than that associated with subsequent privatization. However, the rival firms continued to react negatively to the initial privatization but positively to partial privatization announcements in the days immediately following the announcement. The difference in reaction on day +1 of about 1% is strongly significant (t-statistic=3.41, p-value=0.0001). In terms of the cumulative abnormal returns, the magnitude of the rival firms' (adverse) reaction following the first privatization announcements is greater than that associated with subsequent partial privatization for all the event windows except that of the 21-day ( $CAR_{(-10,10)}$ ) period. For example, in the 5-days surrounding the privatization announcement date, the rival firms' reaction to the first privatization was -1.04% while their reaction to partial privatization announcements was 0.26%, the difference of -1.31% is significant at 6%. The rival firms' cumulative abnormal returns therefore support the conjecture that the first privatization announcement contained more surprise than subsequent privatization announcements.

**3) Is the rival firms' adverse reaction to partial privatization announcement increasing in the degree of government ownership of the privatized firm?**

We examine whether the rival firms' reaction to partial privatization announcement is negatively related to the degree of privatization. As the percentage of government ownership reduces with each subsequent partial privatization, the privatized firms could have increasing discretion to pursue investment opportunities with less interference from the government. The rival firms' reaction to partial privatization announcements could reflect this new and

increasing degree of autonomy that the privatized firm may have with every subsequent partial privatization. We present the rival firms' reaction to the first, second, third, fourth and final privatization announcements in Panel C of Table 5.<sup>10</sup> Consistent with the evidence presented in Panel A, we find that the initial partial privatization announcement generated a larger fall in wealth of the shareholders of the rival firms (of -0.40%) on the announcement day than the second partial privatization announcement (-0.13%).

Also, we document negatively large cumulative abnormal returns from the rivals following the initial privatization announcement than the second privatization announcement. Thus, the first partial privatization was more informative than the second partial privatization announcement. However, we note from the table that as the proportion of government ownership further reduces, subsequent partial privatization announcements generate stronger market reaction from rival firms. The third, fourth and final privatization announcements generated announcement day abnormal returns of -0.18%, -2.37% and -1.60% respectively. Similarly, the percentage of rival firms that reacted negatively to the privatization announcements were 50%, 89% and 57% for the third, fourth and final privatization respectively. Furthermore, for the 3 days surrounding the announcement day, the rival firms' cumulative abnormal returns were -0.53%, 0.32%, 0.46%, -0.62% and -1.63% for the first, second, third, fourth and final privatization announcement respectively. Thus, there is some, albeit weak evidence to support the conjecture that the rival firms' reaction to the privatization announcement is negatively related to the degree of government ownership of the privatized firms.

---

<sup>10</sup> A few firms were privatized 5 or 6 times. However, because of the small sample size, we do not perform any analysis on these sub-samples.

## **V Test of alternative explanations for the rival firms' abnormal returns**

### **A Examination of alternative hypotheses.**

We recognize that there could be other reasons why the rival firms reacted negatively to the privatization announcement apart from competitive considerations, therefore in this section, we undertake several tests of alternative explanations for our results. First, share issue privatization expands the investment opportunity set of investors. The newly privatized firms could attract investors who would otherwise have invested in the existing rival firms, thus generating the negative abnormal returns for the rival firms. Second, fund managers who track sector indices could move some of their funds to the newly privatized firms in anticipation of the inclusion of the privatized firm in the index in order to minimize tracking error. Thus, portfolio rebalancing and the attendant price pressure effects could cause a decrease in the share price of the existing firms. Third, as Subrahmanyam and Titman (1999) argue, the presence of newly publicly traded firms in an industry can attract more information gathering about the industry and this can make the prices of all firms in the industry more efficiently priced. While test of the last conjecture is beyond the scope of this paper, we examine the possibility that capital flows account for the rival firms' stock price reaction.

First, we note that investors may move their capital to the newly privatized firms if they believe that the newly privatized firms' prospects are better than the existing firms' prospects. In that case, the attendant decrease in price of the rival firms would be consistent with our hypothesis that investors' expectation about the efficiency and competitiveness of the privatized firms can be inferred from the rival firms' price effects following the privatization announcement. Second, if the fall in the share price of the existing firms is caused by the activities of fund managers moving funds from existing firms to the newly privatized firms with a view to maintaining their exposure to that sector, then portfolio

rebalancing, and the attendant price pressure effects, would cause a decrease in the share price of the existing firms and a corresponding increase in the share price of the newly privatized firms. To test this conjecture, we first calculate the returns for the privatized firms following the initial privatization and subsequent partial privatizations and present the results in Table 6.

We note that while most of the daily abnormal returns are not significant, the cumulative abnormal returns for the post initial public offering periods (i.e.  $CAR_{(1,30)}$ ,  $CAR_{(1,40)}$ ,  $CAR_{(1,50)}$  and  $CAR_{(1,60)}$ ) are positive and significant. The industry adjusted abnormal returns (which account for industry factors that are unrelated to the privatization) also show that the privatized firms performed better than their industry counterparts in the post privatization period. However, this outperformance could be due to two factors, namely price pressure effects and the well-documented underpricing of initial public offerings. For government IPOs, the underpricing following the initial privatization could be widespread since that would ensure that shares in subsequent government privatizations are well subscribed.

The privatized firms' abnormal returns following subsequent privatizations provide a partial benchmark for evaluating the price pressure hypothesis. If it is portfolio rebalancing per se that explains the privatized firms' initial positive abnormal returns and, hence, the rival firms negative abnormal returns, then subsequent privatization that leads to an increase in the weight of the privatized firms in the index should also elicit significantly positive increase in share price of the privatized firms. However, this does not appear to be the case as the privatized firms' shares underperformed the market and their industry counterparts' in the period leading up to and following the subsequent privatization announcements. For

subsequent privatization announcements, the privatized firms experienced negative cumulative abnormal returns for the different event windows.

[Fix Table 6 here]

## **B Further test of the price pressure hypothesis**

In this section, we perform a stronger test of the portfolio-rebalancing hypothesis by running the following regressions of the privatized firms' returns on the rival firms' abnormal returns.

$$CAR_{(t1,t2) \text{ privatized}} = \mathbf{a}_i + \mathbf{b}_i AR_{(0) \text{ rival}} + \mathbf{e}_i \quad (1)$$

$$CAR_{(t1,t2) \text{ privatized}} = \mathbf{a}_i + \mathbf{b}_i CAR_{(t1,t2) \text{ rivals}} + \mathbf{e}_i \quad (2)$$

We run equation 1 for the initial privatization announcement and equation 2 for subsequent privatization announcements. For equation 1, the dependent variable is the privatized firms' post-listing returns for different time periods and the independent variable is the rival firms' abnormal returns on the announcement day. For equation 2, the dependent variable is the cumulative abnormal returns of the privatized firms for different symmetric event windows surrounding the announcement day and the independent variable is the cumulative abnormal returns of the rival firms for the same period as the dependent variable. If the rival firms' negative abnormal returns are due to fund managers reducing their investment in the rival firms to set aside money to buy shares of the newly privatized firms, then the coefficient of the rival firms' abnormal returns in equations 1 and 2 will be significantly negative and the intercept will also be zero. That is, if price pressure hypothesis explains the rival firms' reaction, then  $\alpha=0$  and  $\beta<0$ . Also, following Kaul, Mehrotra, and Morck, (2000), we would expect  $\beta=-1$  for complete portfolio rebalancing. We also run regressions 1 and 2 separately for our emerging market and developed market samples because index fund activities and portfolio rebalancing may be executed in informationally efficient capital markets. Hence, if

portfolio rebalancing explains the results, we would expect to observe this phenomenon particularly in developed capital markets.

**[Fix Table 7 here]**

The results of the test are presented in Table 7. Panel A indicates the results of the initial privatization for the full sample, developed and emerging market samples and Panel B shows the results for subsequent privatizations. The full sample results indicate that alpha is zero for all the post announcement period regressions except for the regression that uses  $CAR_{(1,30)}$  as the dependent variable. Beta has the correct sign for the regressions with  $CAR_{(1,10)}$ ,  $CAR_{(1,40)}$ ,  $CAR_{(1,50)}$  and  $CAR_{(1,60)}$  as the dependent variable. However, contrary to expectations regarding portfolio rebalancing and price pressure hypothesis, none of the coefficients is significantly different from zero.<sup>11</sup> For the subsequent privatization announcements, there is also no evidence that the negative abnormal returns earned by shareholders of the rival firms are due to price pressure effects resulting from portfolio rebalancing. The coefficients of interest are not significant except  $\beta_{(-10,10)}$  that is marginally significant at 10%. However, the hypothesis that  $\beta = -1$  is rejected and the  $R^2$  for the regression is only 0.08.

Turning to the developed capital markets, we find that contrary to expectation, none of the coefficients of interest is significant, except  $\beta_{(1,10)}$  for the subsequent privatization that is marginally significant at 10% with an  $R^2$  of 0.12. However, the hypothesis that  $\beta_{(1,10)} = -1$  is rejected. For the emerging market sample however,  $\beta_{(1,60)}$  for the initial privatization and  $\beta_{(-1,1)}$  and  $\beta_{(1,30)}$  for subsequent privatizations are significantly different from zero. The  $R^2$  of 0.38,

---

<sup>11</sup> Assuming that investors started selling out of the rival firms earlier than the announcement date, then using  $AR_0$  as the independent variable in regression 1 will not capture the intended effects so we also use the rival firms'  $CAR_{(-10,0)}$  as the dependent variable in equation 1 but the results are similar and are not reported here.

0.72 and 0.35 are relatively large, but once again, contrary to expectations,  $\beta_{(1,30)}$  for subsequent privatization has the wrong sign and  $\beta_{(-1,1)} = -1$  is also rejected. Thus only the emerging market regression coefficient  $\beta_{(1,60)}$  for the initial privatization has the correct sign and the expected test results but the coefficient is marginally significant at 10%. At any rate, only four of the 60 regression coefficients are significantly different from zero and have the correct sign, but all of them are marginally significant at 10%. This evidence, together with the finding that subsequent partial privatizations that supposedly lead to an increase in the weights of the privatized firms in the index generated negative abnormal returns for the privatized firms, shows that the rival firms' negative abnormal returns are not caused by price pressure effects. Thus we conclude that the negative effects observed for the rivals of privatized firms reflect investors' concern about the expected gains in efficiency and competitiveness of the privatized firms.

## **VI Summary and conclusion**

There is a large amount of research that shows that privatization improves the performance of privatized firms. However, studies that analyze intra-industry effects of privatization announcements are scarce. We contribute to the literature by analyzing rival firms' reaction to privatization announcements using a large sample of share issue privatizations and rival firms from 29 developed and developing countries across 28 industries with a view to ascertaining whether the information contained in the privatization announcement reflects competitive considerations or positive industry wide effects. We find that our sample of rival firms reacted negatively to the privatization announcements thus suggesting that the rival firms' reaction to privatization announcements reflects competitive considerations rather than positive industry



effects. The reaction of the rival firms in developing countries is stronger than that in developed countries.

Interestingly, we find that the magnitude of the rival firms' reaction to full privatization announcements is greater than their reaction to partial privatization announcements. The initial privatization announcements also contain more surprise than the second (partial) privatization announcements. However, for subsequent partial privatization announcements, we find a somewhat negative relationship between the rivals' reaction and the degree of privatization. As the proportion of government ownership reduces, subsequent partial privatization generates stronger (negative) rivals' reaction. The results of further analysis do not support the conjecture that price pressure effects account for the rival firms' negative abnormal returns. Our results thus provide additional evidence on the impact of privatization from a different perspective.

## References

- Boardman, A., and A. R. Vining, 1989, Ownership and performance in competitive environments: A comparison of the performance of private, mixed and state-owned enterprises, *Journal of Law and Economics* 32, 1-33.
- Boubakri N., and J. Cosset, 1998, The financial and operating performance of newly privatized firms: Evidence from developing countries, *Journal of Finance* 53, 1081-1110.
- Bortolotti B, M. Fantini and C. Scarpa, 2000, Why do governments sell privatized companies abroad, Working paper, Fondazione Eni Enrico Mattei, Milan, Italy.
- Boycko, M., A. Shleifer and R. W. Vishny, 1996, A theory of privatization, *Economic Journal* 106, 309-319.
- D'Souza, J, W. Megginson and R. Nash, 2000, Determinants of performance improvements in privatized firms: The role of restructuring and corporate governance, Working paper, University of Oklahoma.
- Eckel, C., D. Eckel, and V. Singal, 1997, Privatization and efficiency: Industry effects of the sale of British Airways, *Journal of Financial Economics* 43, 275-298.
- Errunza, V.R and S.C. Mazumdar, 2000, Privatization: A theoretical framework, working paper, McGill University.
- Galal, A., L. Jones, P. Tandon, and I. Vogelsang, 1994, Welfare consequences of selling public enterprises, The World Bank, Washington D.C.
- Jones, S., W. Megginson, R. Nash and J. Netter, 1999, Share issue privatizations as financial means to political ends, *Journal of Financial Economics*, 53, 217-53
- Kaul, A., V. Mehrotra, and R. Morck, 2000, Demand curves for stock do slope down: New evidence from an index weight adjustment, *Journal of Finance* 55, 893-912.
- Megginson, W. L., R. C. Nash, and M. van Randenborgh, 1994, The financial and operating performance of newly privatized firms: An international empirical analysis, *Journal of Finance* 49, 403-452.
- Megginson, W. L., and J. M Netter, 1998, From state to market: A survey of empirical studies on privatization, *Journal of Economic Literature*, 39 321-389.
- Megginson, W. L., 2000, Appendix Detailing Share Issue Privatization Offerings, 1961-2000, Working Paper, University of Oklahoma

- Otchere, I and Z. Zhang, 2001, Privatization, Efficiency and Intra-Industry Effects: Analysis of China's Privatization, *International Review of Finance*, 2001 Vol 2 No1/2 49-70.
- Otchere, I and J. Chan, (2002), Intra-Industry effects of bank privatization: A clinical analysis of the privatization of the Commonwealth Bank of Australia, *Journal of Banking and Finance*, forthcoming
- Shleifer, A and R. Vishny, 1994, Politicians and firm, *Quarterly Journal of Economics*, 109, 995-1025.
- Subrahmanyam A., and S. Titman (1999), 'The going-public decision and the development of financial markets', *Journal of Finance*, 54, 1045-1082.
- Toohey, B (2002) Telstra split would cut Fels' workload', *The Australian financial Review*, July 20-21, 51.
- Verbrugge, J. A., W. L., Megginson, and W. Lee, 1999, The financial performance of privatized banks: an empirical analysis, Working paper (University of Georgia).
- Vickers, J. and G. Yarrow 1989, Privatization: An Economic Analysis. Cambridge: MIT Press.

**Table 1**

This table shows the distribution of the sample of share issue privatizations and the rival firms by country and industry. The privatizations occurred between 1981 and 2000. The sample spans across 28 countries of which 57% are from developed capital markets and the remaining are from developing countries. The rival firms are from the same country and industry (2-SIC) as the privatized firms.

Country	No. of privatizations	No. of rivals
<b><i>Panel A: Developed capital markets</i></b>		
Australia	7	33
Austria	2	2
Canada	8	23
Finland	3	3
France	11	21
Germany	5	19
Israel	4	13
Italy	6	16
Japan	5	17
New Zealand	1	1
Spain	8	14
Sweden	1	3
UK	<u>8</u>	<u>14</u>
Sub-total	69	179
<b><i>Panel B: Emerging capital markets</i></b>		
China	8	20
Czech Republic	3	4
Egypt	1	1
Greece	3	18
Hungary	1	1
India	12	35
Indonesia	1	6
Malaysia	3	5
Peru	1	2
Poland	3	6
Portugal	5	7
Singapore	3	5
South Africa	1	1
South Korea	4	17
Taiwan	2	4
Turkey	<u>1</u>	<u>3</u>
Sub-total	52	135
<b>TOTAL</b>	<b><u>121</u></b>	<b><u>314</u></b>
<b><i>Panel C: Non competitive</i></b>		
Telecom	15	39
Banks	31	97
Utilities	<u>3</u>	<u>9</u>
Sub-total	49	145
<b><i>Panel D: Competitive</i></b>		
Energy/Resources	13	31
Manufacturing	48	117
Transport	9	19
Others	<u>2</u>	<u>2</u>
Sub-total	72	169
<b>TOTAL</b>	<b><u>121</u></b>	<b><u>314</u></b>

**Table 2: Rival firms' reaction to privatization announcements**

This table presents the daily and cumulative abnormal returns over different return intervals for a sample of 314 rivals of 121 firms that were privatized from 1981 to 2000. Abnormal returns are calculated using the market model parameter estimation of 200 days prior to day  $-21$  relative to the announcement date. Each country's market index is used in the market model to calculate the regression parameters. The abnormal returns are cumulated over  $-20$  to  $+20$  interval. The percentage negative is the ratio of firms with negative abnormal returns to the total sample.

Day(s)	% Return	t-statistics	p-value	% negative
<i>Panel A: Abnormal returns around the time of the privatization announcement (N=314)</i>				
-10	-0.401	-1.84	0.067	58
-9	0.079	0.31	0.758	56
-8	-0.016	-0.05	0.956	52
-7	0.094	0.37	0.710	54
-6	0.009	0.04	0.971	53
-5	-0.031	-0.19	0.850	53
-4	0.024	0.13	0.895	52
-3	0.040	0.14	0.892	53
-2	-0.045	-0.19	0.846	57
-1	0.032	0.18	0.857	50
0	-0.540	-2.93	0.004	54
1	0.083	0.64	0.522	50
2	-0.100	-0.49	0.627	50
3	-0.056	-0.33	0.743	50
4	0.041	0.18	0.860	51
5	0.220	0.77	0.443	50
6	-0.221	-1.01	0.312	54
7	-0.091	-0.32	0.749	54
8	-0.365	-1.62	0.106	53
9	0.134	0.68	0.499	51
10	0.002	0.01	0.995	55
<i>Panel B: Cumulative abnormal returns around the time of the announcement</i>				
$CAR_{(-20,20)}$	-0.684	-0.52	0.602	52
$CAR_{(-10,10)}$	-1.108	-1.27	0.204	53
$CAR_{(-5,5)}$	-0.331	-0.58	0.563	53
$CAR_{(-2,2)}$	-0.570	-1.64	0.102	53
$CAR_{(-1,1)}$	-0.425	-1.72	0.086	53

**Table 3: Rivals firms' differential reaction to privatization announcement in developed and developing capital markets**

This table presents the daily and cumulative abnormal returns over different return interval for a sample of 314 rivals of 121 firms that were privatized from 1981 to 2000. About 57% of the rival firms are from developed capital markets while the remaining come from emerging markets. The classification of the sample into developed and developing sub-sample is based on the 'information rich' criteria used in Megginson, Nash, van Randenborgh (1994) and Boubakri and Cosset (1998). Abnormal returns are calculated using the market model. The regression parameters were estimated using 200 observations ending on day -21 relative to the announcement date. Each country's market index is used in the market model to calculate the regression parameters. The abnormal returns are cumulated over -20 to +20 interval. The percentage negative is the ratio of firms with negative abnormal returns to the total sample.

Day(s)	Developed (N=179)			Developing (N=135)			Difference in means		
	% Return	t-statistic	% negative	% Return	t-statistic	% negative	% Return	t-statistic	% negative
-5	0.210	0.86	49	-0.350	-1.75*	58	0.056	1.78	0.038
-4	0.050	0.19	51	-0.010	-0.04	53	0.061	0.17	0.434
-3	0.059	0.12	54	0.016	0.05	51	0.043	0.08	0.469
-2	0.209	0.56	54	-0.382	-1.87**	61	0.592	1.38	0.084
-1	0.206	0.76	49	-0.198	-0.96	51	0.405	1.18	0.119
0	-0.523	-1.93*	50	-0.563	-2.41**	59	0.040	0.11	0.455
1	0.046	0.27	52	0.132	0.65	47	-0.086	-0.33	0.372
2	-0.372	-1.35	54	0.261	0.86	46	-0.633	-1.54	0.062
3	0.186	0.88	47	-0.378	-1.35	53	0.564	1.60	0.055
4	-0.367	-1.38	55	0.581	1.44	46	-0.948	-1.96	0.026
5	0.331	0.76	49	0.073	0.22	50	0.258	0.47	0.319
CAR <sub>(-20,20)</sub>	0.557	0.31	51	-2.329	-1.22	53	2.886	1.10	0.136
CAR <sub>(-10,10)</sub>	-0.220	-0.17	50	-2.286	-2.16**	56	2.066	1.23	0.109
CAR <sub>(-5,5)</sub>	0.037	0.05	54	-0.819	-1.00	52	0.856	0.75	0.227
CAR <sub>(-2,2)</sub>	-0.433	-0.86	54	-0.751	-1.65*	52	0.318	0.47	0.320
CAR <sub>(-1,1)</sub>	-0.271	-0.78	51	-0.630	-1.85*	56	0.359	0.74	0.231

\*\*\*, \*\*, \* significant at 1%, 5% and 10% respectively

**Table 4: Rival firm's differential reaction to privatization of firm in non competitive and competitive industries**

This table presents the daily and cumulative abnormal returns over different return intervals for a sample of 314 rivals of 121 firms that were privatized from 1981 to 2000. Panel A shows the abnormal returns earned by rival firms in the competitive and non competitive sectors while Panel B indicates the differential reaction of rivals in the non-competitive sector. Firms classified as non-competitive are those that operate in the telecommunication, banking and utilities sectors while all others are classified as being in competitive industries. About 46% of the rivals are classified as operating in non-competitive sectors while the remaining come from competitive sectors. Abnormal returns are calculated using the market model. The regression parameters were estimated using 200 observations ending on day -21 relative to the announcement date. Each country's market index is used in the market model to calculate the regression parameters. The abnormal returns are cumulated over -20 to +20 interval. The percentage negative is the ratio of firms with negative abnormal returns to the total sample.

Day(s)	Non-Competitive (N=145)			Competitive (N=169)			Difference In Means		
	% Return	t-statistic	% negative	% Return	t-statistic	% negative	% Return	t-statistic	% negative
<i>Panel A: Abnormal returns and cumulative abnormal returns around the time of the privatization announcement</i>									
-5	0.079	0.26	55	-0.125	-0.76	51	0.204	0.60	0.275
-4	-0.172	-0.52	51	0.193	1.03	52	-0.365	-0.96	0.170
-3	0.436	0.74	52	-0.299	-1.36	54	0.734	1.17	0.123
-2	0.198	0.43	53	-0.253	-1.42	60	0.451	0.92	0.180
-1	0.070	0.23	50	0.003	0.001	50	0.071	0.19	0.424
0	-0.768	-2.39**	55	-0.344	-1.70*	52	-0.424	-1.12	0.132
1	0.169	0.81	45	0.009	0.05	54	0.161	0.61	0.271
2	-0.127	-0.38	51	-0.076	-0.30	50	-0.051	-0.12	0.452
3	-0.117	-0.41	49	-0.003	-0.02	50	-0.114	-0.32	0.373
4	0.002	0.00	52	0.074	0.35	51	-0.072	-0.15	0.441
5	0.018	0.03	52	0.394	1.39	48	-0.376	-0.63	0.265
CAR <sub>(-20,20)</sub>	1.837	0.88	44	-2.847	-1.73*	59	4.683	1.77	0.039
CAR <sub>(-10,10)</sub>	-0.912	-0.61	50	-1.276	-1.30	56	0.365	0.20	0.419
CAR <sub>(-5,5)</sub>	-0.214	-0.22	54	-0.432	-0.66	52	0.218	0.19	0.427
CAR <sub>(-2,2)</sub>	-0.458	-0.77	52	-0.665	-1.67*	54	0.207	0.29	0.386
CAR <sub>(-1,1)</sub>	-0.529	-1.34	54	-0.336	-1.09	53	-0.193	-0.39	0.350

Panel B: Abnormal returns and cumulative abnormal returns around the time of the privatization in different non competitive industries

Day(s)	BANKS (N=97)			TELECOM (N=39)			UTILITIES (N=9)		
	% Return	t-statistic	% negative	% Return	t-statistic	% negative	% Return	t-statistic	% negative
-5	-0.268	-1.30	62	0.986	1.03	41	-0.118	-0.17	44
-4	-0.151	-0.58	57	-0.626	-0.64	41	1.567	0.92	33
-3	0.162	0.82	53	0.979	0.46	51	1.031	0.80	44
-2	-0.252	-1.34	59	1.769	1.11	36	-1.768	-1.35	67
-1	-0.051	-0.30	51	0.471	0.43	44	-0.360	-1.31	67
0	0.058	0.29	48	-2.650	-2.62 <sup>**</sup>	67	-1.526	-1.57	78
1	0.014	0.06	48	0.498	0.97	41	0.414	0.97	22
2	0.106	0.42	49	-0.634	-0.59	51	-0.439	-1.03	67
3	-0.134	-0.50	51	-0.298	-0.38	44	0.845	0.68	56
4	0.464	0.96	47	-0.437	-0.52	56	-3.067	-1.03	78
5	-0.080	-0.20	49	0.024	0.01	62	1.046	1.40	33
CAR <sub>(-20,20)</sub>	1.323	0.91	46	2.045	0.30	44	6.466	1.45	22
CAR <sub>(-10,10)</sub>	-0.423	-0.45	52	-2.717	-0.54	46	1.645	0.58	44
CAR <sub>(-5,5)</sub>	-0.133	-0.18	53	0.083	0.03	54	-2.375	-1.27	67
CAR <sub>(-2,2)</sub>	-0.124	-0.28	52	-0.545	-0.29	46	-3.679	-2.02 <sup>*</sup>	78
CAR <sub>(-1,1)</sub>	0.022	0.07	53	-1.681	-1.37	51	-1.472	-1.20	78

\*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% respectively



**Table 5: Degree of privatization and rivals firms' reaction**

This table presents the daily and cumulative abnormal returns over different return interval for the rivals of firms that were privatized from 1981 to 2000. Panel A shows the reaction of rival firms to full and partial privatization while Panel B indicates the reaction of rivals to the first privatization and subsequent partial privatization announcements. Panel C also shows the reaction of the rival firms to different partial privatization announcements. Full privatization sample comprises the privatizations in which government ownership is completely eliminated and the privatized firm has complete autonomy. For partial privatizations, the government still has controlling shares in the firms. Abnormal returns are calculated using the market model. The regression parameters were estimated using 200 observations ending on day -21 relative to the announcement date. Each country's market index is used in the market model to calculate the regression parameters. The abnormal returns are cumulated over -20 to +20 interval. Percentage negative is the ratio of firms with negative abnormal returns to the total sample.

*Panel A: Rival firms' reaction to full and partial privatization announcements*

Day(s)	FULL PRIVATIZATION (N=58)			PARTIAL PRIVATIZATION (N=99)			Difference in means		
	% Return	t-statistics	% negative	% Return	t-statistics	% negative	% Return	t-statistics	p-value <sup>♦</sup>
-5	0.541	0.96	60	-0.575	-2.23**	56	1.116	1.80	0.038
-4	-0.535	-1.09	47	0.106	0.36	52	-0.641	-1.12	0.133
-3	-0.027	-0.02	59	0.165	0.57	55	-0.193	-0.14	0.445
-2	0.782	0.83	55	0.129	0.50	54	0.653	0.67	0.253
-1	-0.235	-0.63	53	-0.347	-1.43	57	0.112	0.25	0.401
0	-1.247	-1.86*	55	-0.431	-1.96**	58	-0.817	-1.16	0.125
1	0.128	0.38	47	0.885	3.46***	37	-0.757	-1.78	0.039
2	-0.266	-0.85	55	0.490	1.72*	52	-0.756	-1.78	0.039
3	0.171	0.45	45	-0.170	-0.63	57	0.341	0.73	0.234
4	-0.631	-1.33	60	-0.039	-0.14	57	-0.592	-1.07	0.144
5	1.167	1.06	48	0.360	1.45	44	0.807	0.72	0.238
CAR <sub>(-20,20)</sub>	2.051	0.82	48	3.081	1.49	45	-1.030	-0.32	0.376
CAR <sub>(-10,10)</sub>	-0.293	-0.11	50	-1.037	-0.79	54	0.744	0.25	0.403
CAR <sub>(-5,5)</sub>	-0.153	-0.08	55	0.573	0.63	51	-0.726	-0.35	0.364
CAR <sub>(-2,2)</sub>	-0.838	-0.99	53	0.727	1.51	40	-1.564	-1.61	0.055
CAR <sub>(-1,1)</sub>	-1.354	-1.60	57	0.107	0.31	47	-1.462	-0.72	0.236

***Panel B: Rival firms' reaction to first (full and initial) privatization and subsequent partial privatization announcements***

Day(s)	First (full and initial) Privatization			Subsequent Privatization			Difference in means		
	% Return	t-statistic	% negative	% Return	t-statistic	% negative	Difference	t-statistic	p-value
-5	0.171	0.74	51	-0.11	-0.40	54	0.280	0.79	0.216
-4	-0.090	-0.30	50	-0.19	-0.75	52	0.102	0.26	0.399
-3	-0.156	-0.53	52	0.30	0.56	54	-0.456	-0.75	0.228
-2	-0.494	-1.41	61	0.41	1.06	55	-0.903	-1.73	0.042
-1	0.285	0.75	51	-0.19	-0.91	52	0.477	1.10	0.137
0	-0.361	-1.20	52	-0.70	-2.49**	56	0.344	0.83	0.203
1	-0.456	-2.22**	64	0.52	2.61**	43	-0.980	-3.41	0.000
2	-0.016	-0.04	46	0.23	1.06	54	-0.244	-0.51	0.307
3	-0.064	-0.24	47	-0.03	-0.12	54	-0.037	-0.10	0.458
4	0.374	0.81	49	-0.17	-0.68	57	0.543	1.04	0.150
5	0.143	0.23	52	0.36	0.95	47	-0.218	-0.30	0.383
CAR <sub>(-20,20)</sub>	-0.672	-0.27	52	1.88	1.13	48	-2.552	-0.86	0.195
CAR <sub>(-10,10)</sub>	-0.156	-0.10	53	-0.87	-0.68	51	0.717	0.36	0.361
CAR <sub>(-5,5)</sub>	-0.665	-0.80	54	0.43	0.47	52	-1.091	-0.89	0.187
CAR <sub>(-2,2)</sub>	-1.043	-1.50	60	0.26	0.61	47	-1.305	-1.59	0.056
CAR <sub>(-1,1)</sub>	-0.533	-1.36	60	-0.37	-0.99	51	-0.159	-0.29	0.386

♦ These are one-tail test. \*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% respectively

**Panel C: Rival firms' differential reaction to partial privatizations involving different degrees of government ownership**

Day(s)	Initial Privatization (N=91)			Second Privatization (N=66)			Third Privatization (N=18)			Fourth Privatization (N=9)			Final Privatization (N=44)		
	% Return	t-statistic	% -	% Return	t-statistic	% -	% Return	t-statistic	% -	% Return	t-statistic	% -	% Return	t-statistic	% -
-5	0.133	0.56	49	-0.386	-1.32	53	-0.646	-1.00	61	-2.461	-2.06*	67	0.588	0.83	59
-4	-0.189	-0.57	54	0.498	1.42	48	-1.329	-2.03**	61	-0.275	-0.19	44	-0.883	-1.47	52
-3	0.150	0.49	49	0.097	0.27	56	0.263	0.37	56	0.622	0.62	33	0.648	0.37	55
-2	-0.583	-1.52	59	-0.087	-0.31	58	-0.442	-0.64	56	2.687	2.57**	22	0.981	0.80	52
-1	0.368	0.85	49	-0.483	-1.70*	56	-0.809	-1.54	67	1.584	1.34	11	-0.200	-0.42	50
0	-0.399	-1.22	53	-0.129	-0.44	52	-0.177	-0.38	50	-2.368	-4.24***	89	-1.591	-1.87*	57
1	-0.500	-2.54**	66	0.935	2.86***	35	1.448	1.87*	39	0.165	0.27	56	0.159	0.44	45
2	0.004	0.01	44	0.184	0.63	52	1.511	1.34	50	0.547	1.00	56	-0.161	-0.44	52
3	-0.023	-0.08	48	0.084	0.31	53	-0.268	-0.34	61	-0.835	-0.43	78	0.265	0.56	48
4	0.656	1.29	45	0.013	0.04	50	-0.339	-0.82	61	0.777	0.46	78	-0.404	-0.70	57
5	-0.234	-0.39	55	0.154	0.61	44	0.628	1.17	33	1.702	0.98	56	0.722	0.60	52
CAR <sub>(-20,20)</sub>	-0.592	-0.22	51	3.654	1.38	42	5.238	1.17	44	-0.426	-0.05	56	2.828	0.96	45
CAR <sub>(-10,10)</sub>	0.199	0.12	48	-0.069	-0.04	52	-0.510	-0.14	50	-3.993	-0.60	56	0.346	0.10	41
CAR <sub>(-5,5)</sub>	-0.617	-0.67	53	0.882	0.90	50	-0.160	-0.07	56	2.146	0.34	56	0.124	0.05	52
CAR <sub>(-2,2)</sub>	-1.110	-1.44	62	0.421	0.65	44	1.531	1.23	39	2.615	1.61	22	-0.812	-0.80	55
CAR <sub>(-1,1)</sub>	-0.531	-1.29	59	0.324	0.69	45	0.462	0.53	39	-0.618	-0.43	56	-1.632	-1.55	57

\*\*\*,\*\*,\* denotes significance at 1%, 5% and 10% respectively

**Table 6****Privatized firms' returns following the initial privatization and subsequent partial privatizations**

This table presents the daily and cumulative abnormal returns over different return interval for the privatized firms following the initial privatization and all subsequent privatization announcements. The raw returns are calculated as the change in the stock price of the privatized firms after the initial public offering. For subsequent privatization, we use the market model to calculate the abnormal returns. Abnormal returns are calculated using the market model. The regression parameters were estimated using 200 observations ending on day -21 relative to the announcement date. Each country's market index is used in the market model to calculate the regression parameters. The abnormal returns are cumulated over -20 to +20 interval. For both the initial and subsequent privatizations, we calculate the industry-adjusted returns for the privatized firms as the difference between the returns of each privatized firm and the returns on an equally weighted portfolio of rivals of the privatized firm. The percentage positive is the ratio of firms with positive abnormal returns to the total sample.

Initial Privatization (N=27)					Subsequent Privatization (N=36)				
Day(s)	Raw returns		Industry adjusted returns		Day(s)	Market Model returns		Industry adjusted returns	
	% Return	% positive	% Return	% positive		% Return	% positive	% Return	% positive
					-5	-0.13	42	-0.16	53
					-4	-0.17	58	0.02	50
					-3	-0.09	50	0.01	53
					-2	-0.86***	28	0.14	42
					-1	-0.11	33	-0.19	39
					0	-0.36	39	-0.71	39
1	0.99	56	1.97	59	1	0.21	53	0.98***	61
2	0.99	48	0.96	48	2	0.27	47	0.62	47
3	-0.77	30	-1.01*	37	3	0.05	44	0.25	47
4	0.14	44	-0.05	56	4	0.23	47	-0.02	50
5	0.39	63	-0.13	59	5	0.40	47	0.25	47
CAR <sub>(1,10)</sub>	2.15	70	2.91	63	CAR <sub>(-20,20)</sub>	-4.29	44	3.16	58
CAR <sub>(1,20)</sub>	3.35	70	1.14	56	CAR <sub>(-10,10)</sub>	-1.41	42	0.43	42
CAR <sub>(1,30)</sub>	6.86*	67	3.00	52	CAR <sub>(-5,5)</sub>	-0.57	39	1.19	53
CAR <sub>(1,40)</sub>	8.08**	67	0.06	63	CAR <sub>(-2,2)</sub>	-0.85	42	0.83	56
CAR <sub>(1,50)</sub>	9.11**	67	-1.69	59	CAR <sub>(-1,1)</sub>	-0.26	42	0.07	56
CAR <sub>(1,60)</sub>	8.43*	74	-3.53	63					

\*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% respectively

**Table 7: Regression Results**

This table presents the result of the regression that shows whether the rival firms' reaction to the privatization announcements is due to fund managers portfolio rebalancing activity. For the initial privatization announcement we run the following regression:

$$CAR_{(t1,t2) \text{ privatized}} = a_i + b_i AR_{(0) \text{ rival}} + e_i$$

where the dependant variable is the post listing abnormal returns of the privatized firm and the independent variable is the rival firms' abnormal returns on the announcement date. For subsequent privatization announcement, we run the following regression:

$$CAR_{(t1,t2) \text{ privatized}} = a_i + b_i CAR_{(t1,t2) \text{ rivals}} + e_i$$

where the dependent variable is a symmetric event window abnormal return of the privatized firm and the independent variable is the rival firms' symmetric event window returns.

Dependent Variable	Full Sample					Developed capital markets					Emerging Capital Markets				
	a	b	p-value		R <sup>2</sup>	a	b	p-value		R <sup>2</sup>	a	b	p-value		R <sup>2</sup>
			b = -1	b = 0				b = -1	b = 0				b = -1	b = 0	
<b>Panel A: Initial Privatization</b>															
CAR <sub>(1,5)</sub>	0.02	0.11	0.17	0.86	0.00	0.03	0.19	0.27	0.80	0.00	-0.01	-0.07	0.33	0.95	0.00
CAR <sub>(1,10)</sub>	0.02	-0.49	0.07*	0.54	0.02	0.02	-0.19	0.15	0.82	0.00	-0.003	-1.85	0.11	0.29	0.16
CAR <sub>(1,20)</sub>	0.03	0.003	0.35	0.98	0.00	0.05	0.36	0.57	0.75	0.01	0.00	-0.73	0.42	0.73	0.02
CAR <sub>(1,30)</sub>	0.07*	0.62	0.80	0.69	0.01	0.08	1.52	0.83	0.32	0.06	0.07	-0.96	0.56	0.77	0.01
CAR <sub>(1,40)</sub>	0.07	-1.23	0.17	0.44	0.02	0.07	0.08	0.58	0.96	0.00	0.05	-4.52	0.08	0.15	0.28
CAR <sub>(1,50)</sub>	0.07	-1.92	0.09*	0.26	0.05	0.07	-0.53	0.37	0.75	0.01	0.07	-5.21	0.09	0.15	0.27
CAR <sub>(1,60)</sub>	0.06	-1.84	0.12	0.31	0.04	0.07	-0.50	0.44	0.79	0.00	0.05	-6.22	0.04	0.08*	0.38
<b>Panel B: Subsequent Privatization</b>															
CAR <sub>(-20,20)</sub>	-0.03	-0.36	0.00***	0.18	0.06	-0.06	-0.46	0.00***	1.03	0.12	0.02	0.23	0.30	0.75	0.02
CAR <sub>(-10,10)</sub>	0.01	-0.34	0.00***	0.10*	0.08	-0.03	-0.22	0.00***	0.24	0.06	0.03	-1.22	0.05**	0.26	0.18
CAR <sub>(-5,5)</sub>	-0.01	0.18	0.00***	0.48	0.02	-0.03*	0.14	0.00***	0.41	0.03	0.05	0.44	0.71	0.77	0.01
CAR <sub>(-2,2)</sub>	-0.01	0.22	0.01***	0.42	0.02	-0.02	0.26	0.00***	0.24	0.06	0.06	-2.33	0.16	0.31	0.15
CAR <sub>(-1,1)</sub>	-0.002	0.14	0.00***	0.56	0.01	-0.01	0.39	0.03**	0.14	0.10	0.01	-1.80	0.00*	0.00***	0.72
AR <sub>(0)</sub>	-0.004	-0.05	0.00***	0.79	0.00	-0.01	-0.01	0.00***	0.95	0.00	-0.00	-0.88	0.08*	0.39	0.11
CAR <sub>(1,5)</sub>	0.01	-0.08	0.00***	0.70	0.01	-0.00	-0.07	0.00***	0.54	0.02	0.08	-0.73	0.25	0.62	0.04
CAR <sub>(1,10)</sub>	0.01	-0.39	0.00***	0.11	0.08	-0.00	-0.31	0.00***	0.10*	0.12	0.05	-0.40	0.33	0.78	0.01
CAR <sub>(1,20)</sub>	0.01	-0.21	0.00***	0.44	0.02	-0.02	-0.28	0.00***	0.31	0.05	0.07	0.28	0.40	0.74	0.02
CAR <sub>(1,30)</sub>	-0.03	-0.01	0.00***	0.99	0.00	-0.07	-0.16	0.01***	0.62	0.01	0.01	1.56	0.50	0.09*	0.35
CAR <sub>(1,40)</sub>	-0.03	-0.10	0.00***	0.74	0.00	-0.06	-0.31	0.00***	0.37	0.04	0.03	1.23	0.77	0.14	0.28
CAR <sub>(1,50)</sub>	-0.02	0.03	0.01***	0.92	0.00	-0.08	-0.08	0.01***	0.83	0.00	0.11	1.24	0.82	0.27	0.17
CAR <sub>(1,60)</sub>	-0.05	-0.16	0.00***	0.59	0.01	-0.10	-0.13	0.00***	0.68	0.01	0.09	-0.10	0.29	0.92	0.00

\*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% respectively



## NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

### Fondazione Eni Enrico Mattei Working Papers Series

Our working papers are available on the Internet at the following addresses:

*Server WWW: WWW.FEEM.IT*

*Anonymous FTP: FTP.FEEM.IT*

[http://papers.ssrn.com/abstract\\_id=XXXXXX](http://papers.ssrn.com/abstract_id=XXXXXX)

SUST	1.2001	<i>Inge MAYERES and Stef PROOST: <u>Should Diesel Cars in Europe be Discouraged?</u></i>
SUST	2.2001	<i>Paola DORIA and Davide PETTENELLA: <u>The Decision Making Process in Defining and Protecting Critical Natural Capital</u></i>
CLIM	3.2001	<i>Alberto PENCH: <u>Green Tax Reforms in a Computable General Equilibrium Model for Italy</u></i>
CLIM	4.2001	<i>Maurizio BUSSOLO and Dino PINELLI: <u>Green Taxes: Environment, Employment and Growth</u></i>
CLIM	5.2001	<i>Marco STAMPINI: <u>Tax Reforms and Environmental Policies for Italy</u></i>
ETA	6.2001	<i>Walid OUESLATI: <u>Environmental Fiscal Policy in an Endogenous Growth Model with Human Capital</u></i>
CLIM	7.2001	<i>Umberto CIORBA, Alessandro LANZA and Francesco PAULI: <u>Kyoto Commitment and Emission Trading: a European Union Perspective</u></i>
MGMT	8.2001	<i>Brian SLACK (xlv): <u>Globalisation in Maritime Transportation: Competition, uncertainty and implications for port development strategy</u></i>
VOL	9.2001	<i>Giulia PESARO: <u>Environmental Voluntary Agreements: A New Model of Co-operation Between Public and Economic Actors</u></i>
VOL	10.2001	<i>Cathrine HAGEM: <u>Climate Policy, Asymmetric Information and Firm Survival</u></i>
ETA	11.2001	<i>Sergio CURRARINI and Marco MARINI: <u>A Sequential Approach to the Characteristic Function and the Core in Games with Externalities</u></i>
ETA	12.2001	<i>Gaetano BLOISE, Sergio CURRARINI and Nicholas KIKIDIS: <u>Inflation and Welfare in an OLG Economy with a Privately Provided Public Good</u></i>
KNOW	13.2001	<i>Paolo SURICO: <u>Globalisation and Trade: A “New Economic Geography” Perspective</u></i>
ETA	14.2001	<i>Valentina BOSETTI and Vincenzina MESSINA: <u>Quasi Option Value and Irreversible Choices</u></i>
CLIM	15.2001	<i>Guy ENGELEN (xlii): <u>Desertification and Land Degradation in Mediterranean Areas: from Science to Integrated Policy Making</u></i>
SUST	16.2001	<i>Julie Catherine SORS: <u>Measuring Progress Towards Sustainable Development in Venice: A Comparative Assessment of Methods and Approaches</u></i>
SUST	17.2001	<i>Julie Catherine SORS: <u>Public Participation in Local Agenda 21: A Review of Traditional and Innovative Tools</u></i>
CLIM	18.2001	<i>Johan ALBRECHT and Niko GOBBIN: <u>Schumpeter and the Rise of Modern Environmentalism</u></i>
VOL	19.2001	<i>Rinaldo BRAU, Carlo CARRARO and Giulio GOLFETTO (xliii): <u>Participation Incentives and the Design of Voluntary Agreements</u></i>
ETA	20.2001	<i>Paola ROTA: <u>Dynamic Labour Demand with Lumpy and Kinked Adjustment Costs</u></i>
ETA	21.2001	<i>Paola ROTA: <u>Empirical Representation of Firms’ Employment Decisions by an (S,s) Rule</u></i>
ETA	22.2001	<i>Paola ROTA: <u>What Do We Gain by Being Discrete? An Introduction to the Econometrics of Discrete Decision Processes</u></i>
PRIV	23.2001	<i>Stefano BOSI, Guillaume GIRMANS and Michel GUILLARD: <u>Optimal Privatisation Design and Financial Markets</u></i>
KNOW	24.2001	<i>Giorgio BRUNELLO, Claudio LUPI, Patrizia ORDINE, and Maria Luisa PARISI: <u>Beyond National Institutions: Labour Taxes and Regional Unemployment in Italy</u></i>
ETA	25.2001	<i>Klaus CONRAD: <u>Locational Competition under Environmental Regulation when Input Prices and Productivity Differ</u></i>
PRIV	26.2001	<i>Bernardo BORTOLOTTI, Juliet D’SOUZA, Marcella FANTINI and William L. MEGGINSON: <u>Sources of Performance Improvement in Privatised Firms: A Clinical Study of the Global Telecommunications Industry</u></i>
CLIM	27.2001	<i>Frédéric BROCHIER and Emiliano RAMIERI: <u>Climate Change Impacts on the Mediterranean Coastal Zones</u></i>
ETA	28.2001	<i>Nunzio CAPPUCCIO and Michele MORETTO: <u>Comments on the Investment-Uncertainty Relationship in a Real Option Model</u></i>
KNOW	29.2001	<i>Giorgio BRUNELLO: <u>Absolute Risk Aversion and the Returns to Education</u></i>
CLIM	30.2001	<i>ZhongXiang ZHANG: <u>Meeting the Kyoto Targets: The Importance of Developing Country Participation</u></i>
ETA	31.2001	<i>Jonathan D. KAPLAN, Richard E. HOWITT and Y. Hossein FARZIN: <u>An Information-Theoretical Analysis of Budget-Constrained Nonpoint Source Pollution Control</u></i>
MGMT Coalition	32.2001	<i>Roberta SALOMONE and Giulia GALLUCCIO: <u>Environmental Issues and Financial Reporting Trends</u></i>
Theory Network	33.2001	<i>Shlomo WEBER and Hans WIESMETH: <u>From Autarky to Free Trade: The Impact on Environment</u></i>
ETA	34.2001	<i>Margarita GENIUS and Elisabetta STRAZZERA: <u>Model Selection and Tests for Non Nested Contingent Valuation Models: An Assessment of Methods</u></i>

NRM	35.2001	<i>Carlo GIUPPONI</i> : <u>The Substitution of Hazardous Molecules in Production Processes: The Atrazine Case Study in Italian Agriculture</u>
KNOW	36.2001	<i>Raffaele PACI and Francesco PIGLIARU</i> : <u>Technological Diffusion, Spatial Spillovers and Regional Convergence in Europe</u>
PRIV	37.2001	<i>Bernardo BORTOLOTTI</i> : <u>Privatisation, Large Shareholders, and Sequential Auctions of Shares</u>
CLIM	38.2001	<i>Barbara BUCHNER</i> : <u>What Really Happened in The Hague? Report on the COP6, Part I, 13-25 November 2000, The Hague, The Netherlands</u>
PRIV	39.2001	<i>Giacomo CALZOLARI and Carlo SCARPA</i> : <u>Regulation at Home, Competition Abroad: A Theoretical Framework</u>
KNOW	40.2001	<i>Giorgio BRUNELLO</i> : <u>On the Complementarity between Education and Training in Europe</u>
Coalition Theory Network	41.2001	<i>Alain DESDOIGTS and Fabien MOIZEAU</i> (xlvi): <u>Multiple Politico-Economic Regimes, Inequality and Growth</u>
Coalition Theory Network	42.2001	<i>Parkash CHANDER and Henry TULKENS</i> (xlvi): <u>Limits to Climate Change</u>
Coalition Theory Network	43.2001	<i>Michael FINUS and Bianca RUNDSHAGEN</i> (xlvi): <u>Endogenous Coalition Formation in Global Pollution Control</u>
Coalition Theory Network	44.2001	<i>Wietze LISE, Richard S.J. TOL and Bob van der ZWAAN</i> (xlvi): <u>Negotiating Climate Change as a Social Situation</u>
NRM	45.2001	<i>Mohamad R. KHAWLIE</i> (xlvii): <u>The Impacts of Climate Change on Water Resources of Lebanon- Eastern Mediterranean</u>
NRM	46.2001	<i>Mutasem EL-FADEL and E. BOU-ZEID</i> (xlvii): <u>Climate Change and Water Resources in the Middle East: Vulnerability, Socio-Economic Impacts and Adaptation</u>
NRM	47.2001	<i>Eva IGLESIAS, Alberto GARRIDO and Almudena GOMEZ</i> (xlvii): <u>An Economic Drought Management Index to Evaluate Water Institutions' Performance Under Uncertainty and Climate Change</u>
CLIM	48.2001	<i>Wietze LISE and Richard S.J. TOL</i> (xlvii): <u>Impact of Climate on Tourist Demand</u>
CLIM	49.2001	<i>Francesco BOSELLO, Barbara BUCHNER, Carlo CARRARO and Davide RAGGI</i> : <u>Can Equity Enhance Efficiency? Lessons from the Kyoto Protocol</u>
SUST	50.2001	<i>Roberto ROSON</i> (xlviii): <u>Carbon Leakage in a Small Open Economy with Capital Mobility</u>
SUST	51.2001	<i>Edwin WOERDMAN</i> (xlviii): <u>Developing a European Carbon Trading Market: Will Permit Allocation Distort Competition and Lead to State Aid?</u>
SUST	52.2001	<i>Richard N. COOPER</i> (xlviii): <u>The Kyoto Protocol: A Flawed Concept</u>
SUST	53.2001	<i>Kari KANGAS</i> (xlviii): <u>Trade Liberalisation, Changing Forest Management and Roundwood Trade in Europe</u>
SUST	54.2001	<i>Xueqin ZHU and Ekko VAN IERLAND</i> (xlviii): <u>Effects of the Enlargement of EU on Trade and the Environment</u>
SUST	55.2001	<i>M. Ozgur KAYALICA and Sajal LAHIRI</i> (xlviii): <u>Strategic Environmental Policies in the Presence of Foreign Direct Investment</u>
SUST	56.2001	<i>Savas ALPAY</i> (xlviii): <u>Can Environmental Regulations be Compatible with Higher International Competitiveness? Some New Theoretical Insights</u>
SUST	57.2001	<i>Roldan MURADIAN, Martin O'CONNOR, Joan MARTINEZ-ALER</i> (xlviii): <u>Embodied Pollution in Trade: Estimating the "Environmental Load Displacement" of Industrialised Countries</u>
SUST	58.2001	<i>Matthew R. AUER and Rafael REUVENY</i> (xlviii): <u>Foreign Aid and Direct Investment: Key Players in the Environmental Restoration of Central and Eastern Europe</u>
SUST	59.2001	<i>Onno J. KUIK and Frans H. OOSTERHUIS</i> (xlviii): <u>Lessons from the Southern Enlargement of the EU for the Environmental Dimensions of Eastern Enlargement, in particular for Poland</u>
ETA	60.2001	<i>Carlo CARRARO, Alessandra POME and Domenico SINISCALCO</i> (xlix): <u>Science vs. Profit in Research: Lessons from the Human Genome Project</u>
CLIM	61.2001	<i>Efrem CASTELNUOVO, Michele MORETTO and Sergio VERGALLI</i> : <u>Global Warming, Uncertainty and Endogenous Technical Change: Implications for Kyoto</u>
PRIV	62.2001	<i>Gian Luigi ALBANO, Fabrizio GERMANO and Stefano LOVO</i> : <u>On Some Collusive and Signaling Equilibria in Ascending Auctions for Multiple Objects</u>
CLIM	63.2001	<i>Elbert DIJKGRAAF and Herman R.J. VOLLEBERGH</i> : <u>A Note on Testing for Environmental Kuznets Curves with Panel Data</u>
CLIM	64.2001	<i>Paolo BUONANNO, Carlo CARRARO and Marzio GALEOTTI</i> : <u>Endogenous Induced Technical Change and the Costs of Kyoto</u>
CLIM	65.2001	<i>Guido CAZZAVILLAN and Ignazio MUSU</i> (l): <u>Transitional Dynamics and Uniqueness of the Balanced-Growth Path in a Simple Model of Endogenous Growth with an Environmental Asset</u>
CLIM	66.2001	<i>Giovanni BAIOCCHI and Salvatore DI FALCO</i> (l): <u>Investigating the Shape of the EKC: A Nonparametric Approach</u>
CLIM	67.2001	<i>Marzio GALEOTTI, Alessandro LANZA and Francesco PAULI</i> (l): <u>Desperately Seeking (Environmental) Kuznets: A New Look at the Evidence</u>
CLIM	68.2001	<i>Alexey VIKHLYAEV</i> (xlviii): <u>The Use of Trade Measures for Environmental Purposes – Globally and in the EU Context</u>
NRM	69.2001	<i>Gary D. LIBECAP and Zeynep K. HANSEN</i> (li): <u>U.S. Land Policy, Property Rights, and the Dust Bowl of the 1930s</u>



NRM	70.2001	<i>Lee J. ALSTON, Gary D. LIBECAP and Bernardo MUELLER</i> (li): <u>Land Reform Policies. The Sources of Violent Conflict and Implications for Deforestation in the Brazilian Amazon</u>
CLIM	71.2001	<i>Claudia KEMFERT</i> : <u>Economy-Energy-Climate Interaction – The Model WIAGEM -</u>
SUST	72.2001	<i>Paulo A.L.D. NUNES and Yohanes E. RIYANTO</i> : <u>Policy Instruments for Creating Markets for Biodiversity: Certification and Ecolabeling</u>
SUST	73.2001	<i>Paulo A.L.D. NUNES and Erik SCHOKKAERT</i> (lii): <u>Warm Glow and Embedding in Contingent Valuation</u>
SUST	74.2001	<i>Paulo A.L.D. NUNES, Jeroen C.J.M. van den BERGH and Peter NIJKAMP</i> (lii): <u>Ecological-Economic Analysis and Valuation of Biodiversity</u>
VOL	75.2001	<i>Johan EYCKMANS and Henry TULKENS</i> (li): <u>Simulating Coalitionally Stable Burden Sharing Agreements for the Climate Change Problem</u>
PRIV	76.2001	<i>Axel GAUTIER and Florian HEIDER</i> : <u>What Do Internal Capital Markets Do? Redistribution vs. Incentives</u>
PRIV	77.2001	<i>Bernardo BORTOLOTTI, Marcella FANTINI and Domenico SINISCALCO</i> : <u>Privatisation around the World: New Evidence from Panel Data</u>
ETA	78.2001	<i>Toke S. AIDT and Jayasri DUTTA</i> (li): <u>Transitional Politics. Emerging Incentive-based Instruments in Environmental Regulation</u>
ETA	79.2001	<i>Alberto PETRUCCI</i> : <u>Consumption Taxation and Endogenous Growth in a Model with New Generations</u>
ETA	80.2001	<i>Pierre LASSERRE and Antoine SOUBEYRAN</i> (li): <u>A Ricardian Model of the Tragedy of the Commons</u>
ETA	81.2001	<i>Pierre COURTOIS, Jean Christophe PÉREAU and Tarik TAZDAÏT</i> : <u>An Evolutionary Approach to the Climate Change Negotiation Game</u>
NRM	82.2001	<i>Christophe BONTEMPS, Stéphane COUTURE and Pascal FAVARD</i> : <u>Is the Irrigation Water Demand Really Convex?</u>
NRM	83.2001	<i>Unai PASCUAL and Edward BARBIER</i> : <u>A Model of Optimal Labour and Soil Use with Shifting Cultivation</u>
CLIM	84.2001	<i>Jesper JENSEN and Martin Hvidt THELLE</i> : <u>What are the Gains from a Multi-Gas Strategy?</u>
CLIM	85.2001	<i>Maurizio MICHELINI</i> (liii): IPCC “Summary for Policymakers” in TAR. <u>Do its results give a scientific support always adequate to the urgencies of Kyoto negotiations?</u>
CLIM	86.2001	<i>Claudia KEMFERT</i> (liii): <u>Economic Impact Assessment of Alternative Climate Policy Strategies</u>
CLIM	87.2001	<i>Cesare DOSI and Michele MORETTO</i> : <u>Global Warming and Financial Umbrellas</u>
ETA	88.2001	<i>Elena BONTEMPI, Alessandra DEL BOCA, Alessandra FRANZOSI, Marzio GALEOTTI and Paola ROTA</i> : <u>Capital Heterogeneity: Does it Matter? Fundamental Q and Investment on a Panel of Italian Firms</u>
ETA	89.2001	<i>Efrem CASTELNUOVO and Paolo SURICO</i> : <u>Model Uncertainty, Optimal Monetary Policy and the Preferences of the Fed</u>
CLIM	90.2001	<i>Umberto CIORBA, Alessandro LANZA and Francesco PAULI</i> : <u>Kyoto Protocol and Emission Trading: Does the US Make a Difference?</u>
CLIM	91.2001	<i>ZhongXiang ZHANG and Lucas ASSUNCAO</i> : <u>Domestic Climate Policies and the WTO</u>
SUST	92.2001	<i>Anna ALBERINI, Alan KRUPNICK, Maureen CROPPER, Nathalie SIMON and Joseph COOK</i> (lii): <u>The Willingness to Pay for Mortality Risk Reductions: A Comparison of the United States and Canada</u>
SUST	93.2001	<i>Riccardo SCARPA, Guy D. GARROD and Kenneth G. WILLIS</i> (lii): <u>Valuing Local Public Goods with Advanced Stated Preference Models: Traffic Calming Schemes in Northern England</u>
CLIM	94.2001	<i>Ming CHEN and Larry KARP</i> : <u>Environmental Indices for the Chinese Grain Sector</u>
CLIM	95.2001	<i>Larry KARP and Jiangfeng ZHANG</i> : <u>Controlling a Stock Pollutant with Endogenous Investment and Asymmetric Information</u>
ETA	96.2001	<i>Michele MORETTO and Gianpaolo ROSSINI</i> : <u>On the Opportunity Cost of Nontradable Stock Options</u>
SUST	97.2001	<i>Elisabetta STRAZZERA, Margarita GENIUS, Riccardo SCARPA and George HUTCHINSON</i> : <u>The Effect of Protest Votes on the Estimates of Willingness to Pay for Use Values of Recreational Sites</u>
NRM	98.2001	<i>Frédéric BROCHIER, Carlo GIUPPONI and Alberto LONGO</i> : <u>Integrated Coastal Zone Management in the Venice Area – Perspectives of Development for the Rural Island of Sant’Erasmus</u>
NRM	99.2001	<i>Frédéric BROCHIER, Carlo GIUPPONI and Julie SORS</i> : <u>Integrated Coastal Management in the Venice Area – Potentials of the Integrated Participatory Management Approach</u>
NRM	100.2001	<i>Frédéric BROCHIER and Carlo GIUPPONI</i> : <u>Integrated Coastal Zone Management in the Venice Area – A Methodological Framework</u>
PRIV	101.2001	<i>Enrico C. PEROTTI and Luc LAEVEN</i> : <u>Confidence Building in Emerging Stock Markets</u>
CLIM	102.2001	<i>Barbara BUCHNER, Carlo CARRARO and Igor CERSOSIMO</i> : <u>On the Consequences of the U.S. Withdrawal from the Kyoto/Bonn Protocol</u>
SUST	103.2001	<i>Riccardo SCARPA, Adam DRUCKER, Simon ANDERSON, Nancy FERRAES-EHUAN, Veronica GOMEZ, Carlos R. RISOPATRON and Olga RUBIO-LEONEL</i> : <u>Valuing Animal Genetic Resources in Peasant Economies: The Case of the Box Keken Creole Pig in Yucatan</u>
SUST	104.2001	<i>R. SCARPA, P. KRISTJANSON, A. DRUCKER, M. RADENY, E.S.K. RUTO, and J.E.O. REGE</i> : <u>Valuing Indigenous Cattle Breeds in Kenya: An Empirical Comparison of Stated and Revealed Preference Value Estimates</u>
SUST	105.2001	<i>Clemens B.A. WOLLNY</i> : <u>The Need to Conserve Farm Animal Genetic Resources Through Community-Based Management in Africa: Should Policy Makers be Concerned?</u>
SUST	106.2001	<i>J.T. KARUGIA, O.A. MWAI, R. KAITHO, Adam G. DRUCKER, C.B.A. WOLLNY and J.E.O. REGE</i> : <u>Economic Analysis of Crossbreeding Programmes in Sub-Saharan Africa: A Conceptual Framework and Kenyan Case Study</u>
SUST	107.2001	<i>W. AYALEW, J.M. KING, E. BRUNS and B. RISCHKOWSKY</i> : <u>Economic Evaluation of Smallholder Subsistence Livestock Production: Lessons from an Ethiopian Goat Development Program</u>

SUST	108.2001	<i>Gianni CICIA, Elisabetta D'ERCOLE and Davide MARINO</i> : <u>Valuing Farm Animal Genetic Resources by Means of Contingent Valuation and a Bio-Economic Model: The Case of the Pentro Horse</u>
SUST	109.2001	<i>Clem TISDELL</i> : <u>Socioeconomic Causes of Loss of Animal Genetic Diversity: Analysis and Assessment</u>
SUST	110.2001	<i>M.A. JABBAR and M.L. DIEDHOU</i> : <u>Does Breed Matter to Cattle Farmers and Buyers? Evidence from West Africa</u>
SUST	1.2002	<i>K. TANO, M.D. FAMINOW, M. KAMUANGA and B. SWALLOW</i> : <u>Using Conjoint Analysis to Estimate Farmers' Preferences for Cattle Traits in West Africa</u>
ETA	2.2002	<i>Efrem CASTELNUOVO and Paolo SURICO</i> : <u>What Does Monetary Policy Reveal about Central Bank's Preferences?</u>
WAT	3.2002	<i>Duncan KNOWLER and Edward BARBIER</i> : <u>The Economics of a "Mixed Blessing" Effect: A Case Study of the Black Sea</u>
CLIM	4.2002	<i>Andreas LÖSCHEL</i> : <u>Technological Change in Economic Models of Environmental Policy: A Survey</u>
VOL	5.2002	<i>Carlo CARRARO and Carmen MARCHIORI</i> : <u>Stable Coalitions</u>
CLIM	6.2002	<i>Marzio GALEOTTI, Alessandro LANZA and Matteo MANERA</i> : <u>Rockets and Feathers Revisited: An International Comparison on European Gasoline Markets</u>
ETA	7.2002	<i>Effrosyni DIAMANTOUDI and Eftichios S. SARTZETAKIS</i> : <u>Stable International Environmental Agreements: An Analytical Approach</u>
KNOW	8.2002	<i>Alain DESDOIGTS</i> : <u>Neoclassical Convergence Versus Technological Catch-up: A Contribution for Reaching a Consensus</u>
NRM	9.2002	<i>Giuseppe DI VITA</i> : <u>Renewable Resources and Waste Recycling</u>
KNOW	10.2002	<i>Giorgio BRUNELLO</i> : <u>Is Training More Frequent when Wage Compression is Higher? Evidence from 11 European Countries</u>
ETA	11.2002	<i>Mordecai KURZ, Hehui JIN and Maurizio MOTOLESE</i> : <u>Endogenous Fluctuations and the Role of Monetary Policy</u>
KNOW	12.2002	<i>Reyer GERLAGH and Marjan W. HOFKES</i> : <u>Escaping Lock-in: The Scope for a Transition towards Sustainable Growth?</u>
NRM	13.2002	<i>Michele MORETTO and Paolo ROSATO</i> : <u>The Use of Common Property Resources: A Dynamic Model</u>
CLIM	14.2002	<i>Philippe QUIRION</i> : <u>Macroeconomic Effects of an Energy Saving Policy in the Public Sector</u>
CLIM	15.2002	<i>Roberto ROSON</i> : <u>Dynamic and Distributional Effects of Environmental Revenue Recycling Schemes: Simulations with a General Equilibrium Model of the Italian Economy</u>
CLIM	16.2002	<i>Francesco RICCI (I)</i> : <u>Environmental Policy Growth when Inputs are Differentiated in Pollution Intensity</u>
ETA	17.2002	<i>Alberto PETRUCCI</i> : <u>Devaluation (Levels versus Rates) and Balance of Payments in a Cash-in-Advance Economy</u>
Coalition Theory Network	18.2002	<i>László Á. KÓCZY (liv)</i> : <u>The Core in the Presence of Externalities</u>
Coalition Theory Network	19.2002	<i>Steven J. BRAMS, Michael A. JONES and D. Marc KILGOUR (liv)</i> : <u>Single-Peakedness and Disconnected Coalitions</u>
Coalition Theory Network	20.2002	<i>Guillaume HAERINGER (liv)</i> : <u>On the Stability of Cooperation Structures</u>
NRM	21.2002	<i>Fausto CAVALLARO and Luigi CIRAULO</i> : <u>Economic and Environmental Sustainability: A Dynamic Approach in Insular Systems</u>
CLIM	22.2002	<i>Barbara BUCHNER, Carlo CARRARO, Igor CERSOSIMO and Carmen MARCHIORI</i> : <u>Back to Kyoto? US Participation and the Linkage between R&amp;D and Climate Cooperation</u>
CLIM	23.2002	<i>Andreas LÖSCHEL and ZhongXIANG ZHANG</i> : <u>The Economic and Environmental Implications of the US Repudiation of the Kyoto Protocol and the Subsequent Deals in Bonn and Marrakech</u>
ETA	24.2002	<i>Marzio GALEOTTI, Louis J. MACCINI and Fabio SCHIANTARELLI</i> : <u>Inventories, Employment and Hours</u>
CLIM	25.2002	<i>Hannes EGLI</i> : <u>Are Cross-Country Studies of the Environmental Kuznets Curve Misleading? New Evidence from Time Series Data for Germany</u>
ETA	26.2002	<i>Adam B. JAFFE, Richard G. NEWELL and Robert N. STAVINS</i> : <u>Environmental Policy and Technological Change</u>
SUST	27.2002	<i>Joseph C. COOPER and Giovanni SIGNORELLO</i> : <u>Farmer Premiums for the Voluntary Adoption of Conservation Plans</u>
SUST	28.2002	<i>The ANSEA Network</i> : <u>Towards An Analytical Strategic Environmental Assessment</u>
KNOW	29.2002	<i>Paolo SURICO</i> : <u>Geographic Concentration and Increasing Returns: a Survey of Evidence</u>
ETA	30.2002	<i>Robert N. STAVINS</i> : <u>Lessons from the American Experiment with Market-Based Environmental Policies</u>
NRM	31.2002	<i>Carlo GIUPPONI and Paolo ROSATO</i> : <u>Multi-Criteria Analysis and Decision-Support for Water Management at the Catchment Scale: An Application to Diffuse Pollution Control in the Venice Lagoon</u>
NRM	32.2002	<i>Robert N. STAVINS</i> : <u>National Environmental Policy During the Clinton Years</u>
KNOW	33.2002	<i>A. SOUBEYRAN and H. STAHN</i> : <u>Do Investments in Specialized Knowledge Lead to Composite Good Industries?</u>
KNOW	34.2002	<i>G. BRUNELLO, M.L. PARISI and Daniela SONEDDA</i> : <u>Labor Taxes, Wage Setting and the Relative Wage Effect</u>
CLIM	35.2002	<i>C. BOEMARE and P. QUIRION (lv)</i> : <u>Implementing Greenhouse Gas Trading in Europe: Lessons from Economic Theory and International Experiences</u>

CLIM	36.2002	<i>T. TIETENBERG</i> (lv): <u>The Tradable Permits Approach to Protecting the Commons: What Have We Learned?</u>
CLIM	37.2002	<i>K. REHDANZ and R.J.S. TOL</i> (lv): <u>On National and International Trade in Greenhouse Gas Emission Permits</u>
CLIM	38.2002	<i>C. FISCHER</i> (lv): <u>Multinational Taxation and International Emissions Trading</u>
SUST	39.2002	<i>G. SIGNORELLO and G. PAPPALARDO</i> : <u>Farm Animal Biodiversity Conservation Activities in Europe under the Framework of Agenda 2000</u>
NRM	40.2002	<i>S.M. CAVANAGH, W. M. HANEMANN and R. N. STAVINS</i> : <u>Muffled Price Signals: Household Water Demand under Increasing-Block Prices</u>
NRM	41.2002	<i>A. J. PLANTINGA, R. N. LUBOWSKI and R. N. STAVINS</i> : <u>The Effects of Potential Land Development on Agricultural Land Prices</u>
CLIM	42.2002	<i>C. OHL</i> (lvi): <u>Inducing Environmental Co-operation by the Design of Emission Permits</u>
CLIM	43.2002	<i>J. EYCKMANS, D. VAN REGEMORTER and V. VAN STEENBERGHE</i> (lvi): <u>Is Kyoto Fatally Flawed? An Analysis with MacGEM</u>
CLIM	44.2002	<i>A. ANTOCI and S. BORGHESI</i> (lvi): <u>Working Too Much in a Polluted World: A North-South Evolutionary Model</u>
ETA	45.2002	<i>P. G. FREDRIKSSON, Johan A. LIST and Daniel MILLIMET</i> (lvi): <u>Chasing the Smokestack: Strategic Policymaking with Multiple Instruments</u>
ETA	46.2002	<i>Z. YU</i> (lvi): <u>A Theory of Strategic Vertical DFI and the Missing Pollution-Haven Effect</u>
SUST	47.2002	<i>Y. H. FARZIN</i> : <u>Can an Exhaustible Resource Economy Be Sustainable?</u>
SUST	48.2002	<i>Y. H. FARZIN</i> : <u>Sustainability and Hamiltonian Value</u>
KNOW	49.2002	<i>C. PIGA and M. VIVARELLI</i> : <u>Cooperation in R&amp;D and Sample Selection</u>
Coalition Theory Network Coalition Theory Network	50.2002	<i>M. SERTEL and A. SLINKO</i> (liv): <u>Ranking Committees, Words or Multisets</u>
ETA	51.2002	<i>Sergio CURRARINI</i> (liv): <u>Stable Organizations with Externalities</u>
ETA	52.2002	<i>Robert N. STAVINS</i> : <u>Experience with Market-Based Policy Instruments</u>
ETA	53.2002	<i>C.C. JAEGER, M. LEIMBACH, C. CARRARO, K. HASSELMANN, J.C. HOURCADE, A. KEELER and R. KLEIN</i> (liii): <u>Integrated Assessment Modeling: Modules for Cooperation</u>
CLIM	54.2002	<i>Scott BARRETT</i> (liii): <u>Towards a Better Climate Treaty</u>
ETA	55.2002	<i>Richard G. NEWELL and Robert N. STAVINS</i> : <u>Cost Heterogeneity and the Potential Savings from Market-Based Policies</u>
SUST	56.2002	<i>Paolo ROSATO and Edi DEFRANCESCO</i> : <u>Individual Travel Cost Method and Flow Fixed Costs</u>
SUST	57.2002	<i>Vladimir KOTOV and Elena NIKITINA</i> (lvii): <u>Reorganisation of Environmental Policy in Russia: The Decade of Success and Failures in Implementation of Perspective Quests</u>
SUST	58.2002	<i>Vladimir KOTOV</i> (lvii): <u>Policy in Transition: New Framework for Russia's Climate Policy</u>
SUST	59.2002	<i>Fanny MISSFELDT and Arturo VILLAVICENCO</i> (lvii): <u>How Can Economies in Transition Pursue Emissions Trading or Joint Implementation?</u>
VOL	60.2002	<i>Giovanni DI BARTOLOMEO, Jacob ENGWERDA, Joseph PLASMANS and Bas VAN AARLE</i> : <u>Staying Together or Breaking Apart: Policy-Makers' Endogenous Coalitions Formation in the European Economic and Monetary Union</u>
ETA	61.2002	<i>Robert N. STAVINS, Alexander F. WAGNER and Gernot WAGNER</i> : <u>Interpreting Sustainability in Economic Terms: Dynamic Efficiency Plus Intergenerational Equity</u>
PRIV	62.2002	<i>Carlo CAPUANO</i> : <u>Demand Growth, Entry and Collusion Sustainability</u>
PRIV	63.2002	<i>Federico MUNARI and Raffaele ORIANI</i> : <u>Privatization and R&amp;D Performance: An Empirical Analysis Based on Tobin's Q</u>
PRIV	64.2002	<i>Federico MUNARI and Maurizio SOBRERO</i> : <u>The Effects of Privatization on R&amp;D Investments and Patent Productivity</u>
SUST	65.2002	<i>Orley ASHENFELTER and Michael GREENSTONE</i> : <u>Using Mandated Speed Limits to Measure the Value of a Statistical Life</u>
ETA	66.2002	<i>Paolo SURICO</i> : <u>US Monetary Policy Rules: the Case for Asymmetric Preferences</u>
PRIV	67.2002	<i>Rinaldo BRAU and Massimo FLORIO</i> : <u>Privatisations as Price Reforms: Evaluating Consumers' Welfare Changes in the U.K.</u>
CLIM	68.2002	<i>Barbara K. BUCHNER and Roberto ROSON</i> : <u>Conflicting Perspectives in Trade and Environmental Negotiations</u>
CLIM	69.2002	<i>Philippe QUIRION</i> : <u>Complying with the Kyoto Protocol under Uncertainty: Taxes or Tradable Permits?</u>
SUST	70.2002	<i>Anna ALBERINI, Patrizia RIGANTI and Alberto LONGO</i> : <u>Can People Value the Aesthetic and Use Services of Urban Sites? Evidence from a Survey of Belfast Residents</u>
SUST	71.2002	<i>Marco PERCOCO</i> : <u>Discounting Environmental Effects in Project Appraisal</u>
NRM	72.2002	<i>Philippe BONTEMS and Pascal FAVARD</i> : <u>Input Use and Capacity Constraint under Uncertainty: The Case of Irrigation</u>
PRIV	73.2002	<i>Mohammed OMRAN</i> : <u>The Performance of State-Owned Enterprises and Newly Privatized Firms: Empirical Evidence from Egypt</u>
PRIV	74.2002	<i>Mike BURKART, Fausto PANUNZI and Andrei SHLEIFER</i> : <u>Family Firms</u>
PRIV	75.2002	<i>Emmanuelle AURIOL, Pierre M. PICARD</i> : <u>Privatizations in Developing Countries and the Government Budget Constraint</u>
PRIV	76.2002	<i>Nichole M. CASTATER</i> : <u>Privatization as a Means to Societal Transformation: An Empirical Study of Privatization in Central and Eastern Europe and the Former Soviet Union</u>

PRIV	77.2002	<i>Christoph LÜLSFESMANN</i> : <u>Benevolent Government, Managerial Incentives, and the Virtues of Privatization</u>
PRIV	78.2002	<i>Kate BISHOP, Igor FILATOTCHEV and Tomasz MICKIEWICZ</i> : <u>Endogenous Ownership Structure: Factors Affecting the Post-Privatisation Equity in Largest Hungarian Firms</u>
PRIV	79.2002	<i>Theodora WELCH and Rick MOLZ</i> : <u>How Does Trade Sale Privatization Work? Evidence from the Fixed-Line Telecommunications Sector in Developing Economies</u>
PRIV	80.2002	<i>Alberto R. PETRUCCI</i> : <u>Government Debt, Agent Heterogeneity and Wealth Displacement in a Small Open Economy</u>
CLIM	81.2002	<i>Timothy SWANSON and Robin MASON</i> (Ivi): <u>The Impact of International Environmental Agreements: The Case of the Montreal Protocol</u>
PRIV	82.2002	<i>George R.G. CLARKE and Lixin Colin XU</i> : <u>Privatization, Competition and Corruption: How Characteristics of Bribe Takers and Payers Affect Bribe Payments to Utilities</u>
PRIV	83.2002	<i>Massimo FLORIO and Katuscia MANZONI</i> : <u>The Abnormal Returns of UK Privatisations: From Underpricing to Outperformance</u>
NRM	84.2002	<i>Nelson LOURENÇO, Carlos RUSSO MACHADO, Maria do ROSÁRIO JORGE and Luís RODRIGUES</i> : <u>An Integrated Approach to Understand Territory Dynamics. The Coastal Alentejo (Portugal)</u>
CLIM	85.2002	<i>Peter ZAPFEL and Matti VAINIO</i> (Iv): <u>Pathways to European Greenhouse Gas Emissions Trading History and Misconceptions</u>
CLIM	86.2002	<i>Pierre COURTOIS</i> : <u>Influence Processes in Climate Change Negotiations: Modelling the Rounds</u>
ETA	87.2002	<i>Vito FRAGNELLI and Maria Erminia MARINA</i> (Iviii): <u>Environmental Pollution Risk and Insurance</u>
ETA	88.2002	<i>Laurent FRANCKX</i> (Iviii): <u>Environmental Enforcement with Endogenous Ambient Monitoring</u>
ETA	89.2002	<i>Timo GOESCHL and Timothy M. SWANSON</i> (Iviii): <u>Lost Horizons. The noncooperative management of an evolutionary biological system.</u>
ETA	90.2002	<i>Hans KEIDING</i> (Iviii): <u>Environmental Effects of Consumption: An Approach Using DEA and Cost Sharing</u>
ETA	91.2002	<i>Wietze LISE</i> (Iviii): <u>A Game Model of People's Participation in Forest Management in Northern India</u>
CLIM	92.2002	<i>Jens HORBACH</i> : <u>Structural Change and Environmental Kuznets Curves</u>
ETA	93.2002	<i>Martin P. GROSSKOPF</i> : <u>Towards a More Appropriate Method for Determining the Optimal Scale of Production Units</u>
VOL	94.2002	<i>Scott BARRETT and Robert STAVINS</i> : <u>Increasing Participation and Compliance in International Climate Change Agreements</u>
CLIM	95.2002	<i>Banu BAYRAMOGLU LISE and Wietze LISE</i> : <u>Climate Change, Environmental NGOs and Public Awareness in the Netherlands: Perceptions and Reality</u>
CLIM	96.2002	<i>Matthieu GLACHANT</i> : <u>The Political Economy of Emission Tax Design in Environmental Policy</u>
KNOW	97.2002	<i>Kenn ARIGA and Giorgio BRUNELLO</i> : <u>Are the More Educated Receiving More Training? Evidence from Thailand</u>
ETA	98.2002	<i>Gianfranco FORTE and Matteo MANERA</i> : <u>Forecasting Volatility in European Stock Markets with Non-linear GARCH Models</u>
ETA	99.2002	<i>Geoffrey HEAL</i> : <u>Bundling Biodiversity</u>
ETA	100.2002	<i>Geoffrey HEAL, Brian WALKER, Simon LEVIN, Kenneth ARROW, Partha DASGUPTA, Gretchen DAILY, Paul EHRLICH, Karl-Goran MALER, Nils KAUTSKY, Jane LUBCHENCO, Steve SCHNEIDER and David STARRETT</i> : <u>Genetic Diversity and Interdependent Crop Choices in Agriculture</u>
ETA	101.2002	<i>Geoffrey HEAL</i> : <u>Biodiversity and Globalization</u>
VOL	102.2002	<i>Andreas LANGE</i> : <u>Heterogeneous International Agreements – If per capita emission levels matter</u>
ETA	103.2002	<i>Pierre-André JOUVET and Walid OUESLATI</i> : <u>Tax Reform and Public Spending Trade-offs in an Endogenous Growth Model with Environmental Externality</u>
ETA	104.2002	<i>Anna BOTTASSO and Alessandro SEMBENELLI</i> : <u>Does Ownership Affect Firms' Efficiency? Panel Data Evidence on Italy</u>
PRIV	105.2002	<i>Bernardo BORTOLOTTI, Frank DE JONG, Giovanna NICODANO and Ibolya SCHINDELE</i> : <u>Privatization and Stock Market Liquidity</u>
ETA	106.2002	<i>Haruo IMAI and Mayumi HORIE</i> (Iviii): <u>Pre-Negotiation for an International Emission Reduction Game</u>
PRIV	107.2002	<i>Sudeshna GHOSH BANERJEE and Michael C. MUNGER</i> : <u>Move to Markets? An Empirical Analysis of Privatisation in Developing Countries</u>
PRIV	108.2002	<i>Guillaume GIRMENS and Michel GUILLARD</i> : <u>Privatization and Investment: Crowding-Out Effect vs Financial Diversification</u>
PRIV	109.2002	<i>Alberto CHONG and Florencio LÓPEZ-DE-SILANES</i> : <u>Privatization and Labor Force Restructuring Around the World</u>
PRIV	110.2002	<i>Nandini GUPTA</i> : <u>Partial Privatization and Firm Performance</u>
PRIV	111.2002	<i>François DEGEORGE, Dirk JENTER, Alberto MOEL and Peter TUFANO</i> : <u>Selling Company Shares to Reluctant Employees: France Telecom's Experience</u>
PRIV	112.2002	<i>Isaac OTCHERE</i> : <u>Intra-Industry Effects of Privatization Announcements: Evidence from Developed and Developing Countries</u>

- (xlii) This paper was presented at the International Workshop on "Climate Change and Mediterranean Coastal Systems: Regional Scenarios and Vulnerability Assessment" organised by the Fondazione Eni Enrico Mattei in co-operation with the Istituto Veneto di Scienze, Lettere ed Arti, Venice, December 9-10, 1999.
- (xliii) This paper was presented at the International Workshop on "Voluntary Approaches, Competition and Competitiveness" organised by the Fondazione Eni Enrico Mattei within the research activities of the CAVA Network, Milan, May 25-26, 2000.
- (xliv) This paper was presented at the International Workshop on "Green National Accounting in Europe: Comparison of Methods and Experiences" organised by the Fondazione Eni Enrico Mattei within the Concerted Action of Environmental Valuation in Europe (EVE), Milan, March 4-7, 2000
- (xlv) This paper was presented at the International Workshop on "New Ports and Urban and Regional Development. The Dynamics of Sustainability" organised by the Fondazione Eni Enrico Mattei, Venice, May 5-6, 2000.
- (xlvi) This paper was presented at the Sixth Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, January 26-27, 2001
- (xlvii) This paper was presented at the RICAMARE Workshop "Socioeconomic Assessments of Climate Change in the Mediterranean: Impact, Adaptation and Mitigation Co-benefits", organised by the Fondazione Eni Enrico Mattei, Milan, February 9-10, 2001
- (xlviii) This paper was presented at the International Workshop "Trade and the Environment in the Perspective of the EU Enlargement", organised by the Fondazione Eni Enrico Mattei, Milan, May 17-18, 2001
- (xlix) This paper was presented at the International Conference "Knowledge as an Economic Good", organised by Fondazione Eni Enrico Mattei and The Beijer International Institute of Environmental Economics, Palermo, April 20-21, 2001
- (l) This paper was presented at the Workshop "Growth, Environmental Policies and Sustainability" organised by the Fondazione Eni Enrico Mattei, Venice, June 1, 2001
- (li) This paper was presented at the Fourth Toulouse Conference on Environment and Resource Economics on "Property Rights, Institutions and Management of Environmental and Natural Resources", organised by Fondazione Eni Enrico Mattei, IDEI and INRA and sponsored by MATE, Toulouse, May 3-4, 2001
- (lii) This paper was presented at the International Conference on "Economic Valuation of Environmental Goods", organised by Fondazione Eni Enrico Mattei in cooperation with CORILA, Venice, May 11, 2001
- (liii) This paper was circulated at the International Conference on "Climate Policy – Do We Need a New Approach?", jointly organised by Fondazione Eni Enrico Mattei, Stanford University and Venice International University, Isola di San Servolo, Venice, September 6-8, 2001
- (liv) This paper was presented at the Seventh Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Venice, Italy, January 11-12, 2002
- (lv) This paper was presented at the First Workshop of the Concerted Action on Tradable Emission Permits (CATEP) organised by the Fondazione Eni Enrico Mattei, Venice, Italy, December 3-4, 2001
- (lvi) This paper was presented at the ESF EURESCO Conference on Environmental Policy in a Global Economy "The International Dimension of Environmental Policy", organised with the collaboration of the Fondazione Eni Enrico Mattei, Acquafredda di Maratea, October 6-11, 2001
- (lvii) This paper was presented at the First Workshop of "CFEWE – Carbon Flows between Eastern and Western Europe", organised by the Fondazione Eni Enrico Mattei and Zentrum für Europäische Integrationsforschung (ZEI), Milan, July 5-6, 2001
- (lviii) This paper was presented at the Workshop on "Game Practice and the Environment", jointly organised by Università del Piemonte Orientale and Fondazione Eni Enrico Mattei, Alessandria, April 12-13, 2002

## 2002 SERIES

<b>CLIM</b>	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti )
<b>VOL</b>	<i>Voluntary and International Agreements</i> (Editor: Carlo Carraro)
<b>SUST</b>	<i>Sustainability Indicators and Environmental Valuation</i> (Editor: Carlo Carraro)
<b>NRM</b>	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
<b>KNOW</b>	<i>Knowledge, Technology, Human Capital</i> (Editor: Dino Pinelli)
<b>MGMT</b>	<i>Corporate Sustainable Management</i> (Editor: Andrea Marsanich)
<b>PRIV</b>	<i>Privatisation, Regulation, Antitrust</i> (Editor: Bernardo Bortolotti)
<b>ETA</b>	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)