Competition, corporate governance and financing of corporate growth in emerging markets

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COMPETITION, CORPORATE GOVERNANCE AND FINANCING OF CORPORATE GROWTH IN EMERGING MARKETS.

Empirical Investigations in the Light of the Asian Crisis.

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ABSTRACT

The micro-economic behaviour of economic agents in the crisis-affected Asian economies, together with the private sector's expanding role in developing countries in general have focused attention on issues of competition, corporate governance and finance. The paper explores the analytical links between these phenomena. It provides evidence on the dynamics of product market competition in seven emerging economies by time series analysis of persistence of corporate profitability during the 1980s and 90s. The surprising central finding is that the intensity of competition in emerging markets is no less than in advanced countries. The paper also briefly reports on major changes in the financing of corporate growth in India and considers its implications for the extant theories of law, finance and corporate governance.

Keywords: competition, persistency of profits, unit roots, emerging markets.

JEL classification: G3; L1; D4; O1

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Empirical Investigations in the Light of the Asian Crisis.

I. Introduction

The Asian crisis, which in 1997 and 1998 devastated some of the world's hitherto most successful economies, has called attention to the microeconomic behavior of economic agents in these societies. Issues relating to the nature and degree of competition which large firms are subject to, as well as questions of corporate governance and the financing of corporate growth have come in for special scrutiny. A very important and influential analysis of the crisis asserts that although certain macroeconomic imbalances may have provided the trigger for the crisis, its deeper reasons lie in the structural factors inherent in the model of Asian capitalism long implemented by these countries[1].

Specifically, it is suggested that the East Asian crisis has in part been caused by over-investment which in turn resulted from a poor competitive environment and disregard for profits in corporate investment decisions. Similarly, it is argued that the close relationship between government, business and finance, typical in these economies, led to high debt:equity ratios in the corporate sector. High gearing made the corporate sector

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[1] For differing perspectives on the causes of the financial crisis in East Asian countries, see among others Feldstein (1998), Krugman (1998), Roubini *et al.* (1998), Wade and Veneroso (1998), Sachs and Radelet (1998), IMF (1998), World Bank (1998), Singh (1999) and Stiglitz (1999). For contributions which specifically attribute the crisis to the Asian model of capitalism see for example Greenspan (1998), Summers (1998), Frankel (1998), Phelps (1999). See also IMF (1998) and the US Council for Economic Advisers (1998).

financially fragile and vulnerable to interest rate and exchange rate (in the case of external corporate debt) shocks. Krugman (1998) suggested that "crony capitalism" contributed to financial fragility through its pervasiveness in the critical financial sector. The financial sector was under-regulated, political favouritism permitted it to over-invest in areas such as property, and was also subject to implicit guarantees that the government would bail it out if serious problems developed.

A related argument is made in terms of transparency. The international capital markets, it is suggested, did not have adequate information about the true financial status of the East Asian corporations and the banks. Once the markets began to assess the true facts there was a collapse of confidence. As the previous Managing Director of the IMF put it:

> "In Korea, for example, opacity had become systemic. The lack of transparency about government, corporate and financial sector operations concealed the extent of Korea's problems - so much so that corrective action came too late and ultimately could not prevent the collapse of market confidence, with the IMF finally being authorised to intervene just days before potential bankruptcy".[2]

Although this thesis of inadequate competition and poor corporate governance as being the "deeper" causes of the Asian crisis remains controversial[3], it deserves serious examination. This is for three reasons. First, the analysis has found favour not only in the highest circles in the US government, but also with the IMF. Hence the IMF bail-out packages for these countries have required them to fundamentally change their existing institutional arrangements with respect to the relationships between government, banks

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[2] Speech to Transparency International, reported in *IMF Survey*, 9 February 1998.
[3] It has been strongly challenged in Singh (1999a), (1999b). Singh attributes the crisis to the abandonment of some of the basic tenets of an Asian model by the crisis-effected countries in the years immediately

and corporations, so as to make these economies more market oriented, more based on arms-length relationships between the government and the private sector and more subject to the forces of competition rather than government direction. This would involve far-reaching changes in corporate governance arrangements, labour laws and antitrust laws (as well as the enforcement of these laws) in these countries[4].

The second reason for exploring these subjects is that they are important in their own right. They are not only significant in relation to the current Asian crisis and the specific countries affected by it, but are also much more generally relevant for developing countries as a whole. Following privatisation, liberalisation of external markets and internal deregulation, most of these economies now have a greatly enhanced role for the private sector and for market forces. It is therefore important to ask, for example, how competitive is the emerging and expanding private sector in order to assess its economic performance.

Thirdly, and very importantly, despite their intrinsic interest and obvious policy relevance, there is very little research on the nature and degree of competition in emerging markets or on corporate governance and corporate finance in these countries. With respect to the former there are few studies, even in the limited structure- conduct-performance paradigm. Similarly, until the recent efforts by economists at the World Bank and by scholars at the National Bureau of Economic Research (discussed below),

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preceding the crisis. He ascribes the over-investment and misallocation of resources to the property sector to precipitate financial liberalisation. See also Stiglitz, (1998), (1999).

most studies of corporate governance have been concerned only with advanced economies.

The main purpose of this paper is to contribute towards filling this gap in the literature by studying the dynamics of the competitive process in developing countries. It does so by a time-series analysis of the persistence of corporate rates of return in seven emerging markets - South Korea, Thailand, Malaysia, India, Brazil, Mexico and Jordan. The following kinds of questions are asked. How competitive are the developing country product markets and how, in any case, should the intensity of competition be measured? Is competition more intense in Latin American than in Asian markets? How do the Asian and Latin American markets compare in this respect with product markets in the UK, US and other advanced economies?

In addition to the above questions which are the main focus of this paper, it also briefly examines the evolution of the financing of corporate growth and of stock market development in the specific case of the Indian economy in the 1980s and 1990s. It is suggested that this evolution has been rapid and significant and that in many respects, the Indian case is not unique. It, however, raises useful questions for current research on law, finance, corporate governance and development.

The rest of this paper is organised as follows. Section II examines analytical links between competition in product and capital markets, corporate governance and corporate

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[4] The morality and wisdom of imposing such conditionality on sovereign nations by international organisations has been strongly questioned by Feldstein, (1998).

finance. Sections III to V report on the methodology and the results of empirical study of corporate rates of return in seven emerging markets and draw inferences for the intensity of competition in the product markets. Section VI reports briefly on the evolution of corporate finance and stock market development in India during the last two decades and considers its implications for the extant theories of corporate governance in emerging markets. Section VII concludes.

II. Competition, Corporate Governance and Corporate Finance in Advanced and Developing Economies.

II.1 *Competition and Corporate Governance*

Seminal contributions of nearly fifty years ago by Alchian (1950) and Friedman (1953) indicated a close relationship between competition and corporate governance. These studies suggested that regardless of the separation between ownership and control of the kind documented by Berle and Means (1933), competitive selection process in the product markets would ensure that managers are obliged to maximise profits. A careful examination of this claim by Winters (1964) indicated, however, that it was not valid in all states of the world, but only under rather limited conditions of perfect competition and unfettered entry. Specifically, Winters' modeling of the selection mechanism suggested that if there were imperfect competition, barriers to entry and/or economies of scale, managers of large corporations would not need to maximise profits in order to survive.

These findings shifted the argument to the capital market and the market for corporate control. Alchian and Kessel (1962) and Manne (1965) suggested that notwithstanding the degree of competition in product markets, perfect competition in the capital market and in the market for corporate control will resolve Berle and Means's agency problem by forcing managers to maximise share-holders' wealth. Even if the product market were wholly monopolised, those firms which did not maximise monopoly profits and preferred say, the easy life, would become takeover targets for those who were willing to do so. The latter would potentially have higher share prices on the stock market than the former, providing an opportunity and an incentive for a takeover to occur.[5]

Subsequent research has indicated that for a number of theoretical as well as practical reasons - asymmetric information, transactions costs, Grossman and Hart's free rider problem, capital market imperfections - the takeover mechanism on the capital market may not be adequate for the task of resolving agency questions in the modern corporate economy. Further empirical evidence for the advanced economies of the US and the UK[6] indicates that selection in the market for corporate control does not take place entirely on the basis of efficiency, i.e. profitability or stock market valuation. Although profitability matters, absolute size matters a great deal more. A large, relatively unprofitable company has a much better chance of survival than a small profitable one. Moreover, it is almost invariably the large that take over the small. Indeed, the acquisition process may operate

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[5] See further Marris (1964), Singh (1971).
[6] For the UK studies see Meeks (1977); Cosh, Hughes and Singh (1989), (1997); For the US see Schwarz (1982), Mueller (1980), Warshawsky (1987), Ravenscraft and Scherer (1989). For review articles see Hughes (1991), Singh (1992), (1993).

in a perverse way since a large unprofitable company can increase its immunity to takeovers through the takeover process itself - by becoming larger through the acquisition of small firms[7].

Most developing countries do not yet have an active market for corporate control in the Anglo-Saxon sense. Some of them, for example India and Brazil, have embryonic markets which may soon mature. However, these markets are likely to be even more imperfect and suffer from informational deficits than markets in the US and the UK. For these and other reasons, Singh (1998a) argues that such markets are unlikely to provide a satisfactory solution to the corporate governance issues in developing countries.

In view of these difficulties with the market for corporate control, the wheel has come almost the full circle in advanced economies. It has been suggested that it is the severe product market competition in a liberalised global economy which is more likely to constrain corporate managers in the pursuit of their own objectives at the expense of the firm's shareholders[8].   Such competition however is likely to be oligopolistic and of non-price variety, which may not have the welfare enhancing properties of textbook price competition. Be that as it may, Shleifer and Vishny (1997) suggest that despite greater and more intense competition, there will still be an agency problem in large corporations with separation of ownership and control: managers and owners interests as well as their optimal strategies for dealing with competition may differ. Nevertheless, product market competition remains a powerful force for ensuring good corporate governance although it

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[7] Singh (1998), Greer (1986), Singh (1971)
[8] See further, Cosh, Hughes and Singh (1990).

may need to be supplemented by other measures. This is especially so in developing countries where for all its deficiencies, as noted above, there does not yet exist an active market for corporate control.

II.2 *Corporate Finance and Corporate Governance.*

Turning to the relationship between corporate finance and corporate governance, the two are closely related almost by definition. Thus Schleifer and Vishny (1997) in their important review article on the subject: 'Corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment'. The two authors suggest that the central issue of corporate governance is, 'How do suppliers of finance control managers?'.

 In this context it is useful to inquire what would be the economists apriori expectations about how developing country firms would finance their growth; to what extent would they use external rather than internal finance; how would their financing patterns differ from those for advanced country firms. Economic analysis would suggest that developing country corporations, operating as they do in under-developed and imperfect capital markets, may be obliged to finance most of their growth from internal sources. Moreover one would expect them to have little recourse, if any, to the stock market to finance their investment projects. This is due to three reasons. First, because of informational and regulatory shortcomings of emerging stock markets, as well as the fact that most firms in these markets will not have established market reputations, the pricing process is likely to

be noisy and arbitrary. One result would be considerable share price volatility especially compared with that in more mature markets[9]. This volatility would tend to discourage firms from seeking a stock market listing or attempting to raise funds by new issues. Secondly share price volatility reduces the efficiency of market signals and that may also be expected to discourage risk-averse investors from raising funds, and indeed even from securing listings on the stock market. Thirdly, there is evidence to suggest that typically large corporations in developing countries are family-owned and controlled (see further below), which may be expected to make them more reluctant to issue equity for fear of losing control of the corporation. To sum up, these considerations suggest that developing country firms may be expected to rely heavily on internal finance; to the extent that they need more resources they may be expected to resort more to bank borrowings than to raise finance from the stock market; many deserving firms may also shun stock market listing altogether. In other words, corporations in emerging markets, for somewhat different reasons, may also be expected to follow the same pecking-order pattern of finance which is observed in advanced country corporations.[10]

II.3 *Law, Finance and Corporate Governance.*

The study of corporate governance in developing countries has received an enormous stimulus from the recent contributions of La Porta, Lopez de Silanes, Shleifer and Vishny

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[9] For a theoretical discussion of the pricing process in emerging markets see further Tirole (1991).

[10] Myers and Majfluf's (1984) classic paper attributed the pecking order pattern of finance observed for advanced country corporations to essentially asymmetric information between managers and outside investors. Developing country corporations are not immune from asymmetric information, but there are additional reasons to expect, in their case, the greater use of internal finance followed by debt and turning to stock-market finance only as a last resort. See further, Singh (1995).

(referred to as LLSV). In a series of pioneering papers, LLSV (1997), (1998), (1999), (1999a), (2000) have researched the relationship between countries basic legal framework, corporate finance and corporate governance; between company law and corporate ownership structures; between law and dividend policies; and that between protection of minority shareholders and stock market valuation of the companies. The authors and their collaborators (see for example Levine et al (1998); Johnson et al (1998); Rajan and Zingales (1998)) have greatly added to our knowledge of corporate ownership patterns in developed and developing countries. They have also enhanced our understanding of the nature of the agency problem in corporations in non-Anglo Saxon economies. They suggest that outside the U.K. and the U.S., a Berle and Means type of corporation with dispersed shareholding and a separation of ownership from control is a rarity. In most countries, through one mechanism or another, corporations tend to be owner-controlled and managed, usually by families. LLSV perceive the predominant agency problems in these corporations to be one of ensuring that the minority shareholders are not exploited by the dominant family owner-managers.

Empirical evidence from India bearing on the issues raised under II.2 and II.3 above will be briefly considered in Section VI.

III. Measuring the Intensity of Competition in Emerging Markets: Methodological Issues

III.1   Product Market Competition in Emerging Markets

There are divergent opinions about the nature and degree of competition found in developing country product markets. Laffont (1999) suggests for example, that these markets tend to be small and therefore suffer from a variety of imperfections. Many developing countries do not have any anti-trust or anti-monopoly legislation at all. Even when such legislation exists, governments are not always able to enforce it. Further, governments often subsidise large firms to develop national champions and thereby affect market structure, firm behaviour and performance in many distortionary ways.

With respect to the more advanced semi-industrial economies, such as Korea, India or Brazil, it is generally believed that their manufacturing sectors are dominated by large corporations and consequently tend to be monopolistic. Available cross-country evidence for some leading newly-industrialising countries (NICs) provides some support for this view (see Table 1). Other scholars, however, believe that despite extensive government involvement and guidance of corporate activities, and often weak enforcement of anti-trust laws, the domestic markets of many NICs are highly competitive. Thus World Bank (1993) in its seminal study of the East Asian Miracle Economies:

> "Even though Japan and Korea have tended to have high levels of concentration in their manufacturing sector … , domestic competition has usually been vigorous. The Japanese government has proceeded on the assumption that competition among fewer, more evenly matched firms is preferable to having one large firm competing with many smaller rivals, a principle that is well-recognized in athletic competitions (Nalebuff and Stiglitz (1983))."

It is suggested that this competition is not always market-based but may be "contest-based". World Bank (1993) notes:

> "(East Asian Miracle Economies) developed institutional structures

in which firms competed for valued economic prizes, such as access
to credit, in some dimensions while actively cooperating in others;
in short, they created contests."

Porter (1990) endorses this characterization of the intensity of competition in Korea and Japan. In relation to Korea, for example, on the basis of detailed empirical studies of several industries, he suggests that Korean conglomerates compete with each other far more than those in most other countries. Indeed, Porter ascribes the outstanding success of the Korean economy to the high degree of competition among the large oligopolistic firms. However, as indicated in the Introduction, a number of economists attribute the recent crisis in Asian countries, including Korea, to poor competitive environment and the disregard of profits in corporate decisions.

There are, however, very few comparative, systematic empirical studies to shed light on the issue.[11] Even the kind of data in Table 1 is not available for more than a few developing countries, particularly for the 1990s. In this and the following sections we examine the dynamics of competitive process in seven emerging markets during the 1980s and early 1990s. We use the same methodology which has been widely employed for studying the intensity of competition in advanced countries and compare the results for the two groups of countries.[12]

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[11] A notable recent exception is Robertson and Tybout, (1996). The book provides detailed analyses on competitive structure, corporate behaviour and performance for six countries. Chile (1979-1986), Colombia (1997-1985), Mexico (1985-1990), Turkey (1976-1985). See also Amsden, (1989) for a comparison of market structures in Korea and Taiwan. Amjad, (1982) and Kambhampati, (1996) provide useful analyses of structure, conduct and performance of Pakistani and Indian industries respectively.

[12] Such a comparative exercise has not been carried out before for emerging markets except Glen, Singh and Matthias, (1999). The present study improves upon it by using more reliable data and more balanced panels. It also improves methodologically upon the earlier study as well as a number of those carried out for advanced economies.

III.2. *Persistence of Profitability and Intensity of Competition*

One important way of examining the dynamics of the competitive process and measuring the intensity of competition in a market economy is to consider the question of persistence in corporate rates of return. Despite their wide usage, industrial economists accept that structural characteristics of an industry (e.g. concentration ratios such as those in Table 1) do not convey adequate information about the intensity of competition in the modern economy. There may be a high concentration ratio in an industry and yet competition may be intense between oligopolistic firms over market share, new products, design, sales, etc. Such competitive dynamics may be captured by examining the persistence of corporate rates of return. If competition is intense there is likely to be little persistency in the relative rates of return of different firms. Those with above average profits in one period will not be expected to have excess profits in the subsequent period since they will be eroded by competitors. With a lower intensity of competition, profitability differences between firms may be expected to be more persistent. For example, Waring (1996), reports that in the U.S. car industry, the three leading firms had persistent profitability differences throughout the 1970s. General Motors was persistently more profitable than Ford and the latter persistently more profitable than Chrysler. In general in U.S. industry, there was a decline in the persistency of rates of return during this period.

This essentially Schumpetarian perspective on the competitive process has been adopted in a number of studies to examine the dynamics of competition in industrial countries. Following Mueller's (1986) seminal study for U.S. corporate data, empirical studies in this tradition[13] normally use a first order auto-regressive model of corporate profitability which permits the estimation of a company's long-term equilibrium profits, as well as the speed of adjustment towards this long-term level. The model is derived as follows:

A *firm 's* profitability in time period t (P_{tt}) is assumed to consist of three components:

a.   a competitive return on capital C which is common to all companies.

b.   a permanent rent (R_i) peculiar to the firm itself and,

c.   a short run quasi rent (S_{it}) which is also peculiar to the firm, varies over time, and tends toward zero in the long run.

Thus: (1)

It is further assumed that: $S_{it} = \lambda S_{it-1} + U_{it}$ (2)

Where: $0 < \lambda < 1$ and U_{it} are distributed $N(0, \sigma^2)$

From equations (1) and (2), the following equation is obtained:

$$P_{it} = (1 - \lambda)(C + R_i) + \lambda P_{it-1} + U_{it} \qquad (3)$$

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[13] See, for example, Conolly and Schwartz (1985), Geroski and Cubbin (1987), Geroski (1988, 1990), Geroski and Jacquemin (1988), Mueller (1986, 1990), Mueller and Geroski (1990), Odagiri (1994), Schohl (1990), Waring (1996).

Let $\hat{\alpha}$ and $\hat{\lambda}_i$ be the estimates from the autoregressive equation:

$$P_{it} = \hat{a} + \hat{\lambda}_i P_{it-1} + U_{it} \qquad (4)$$

Provided lamda hat (i) is < 1, the equilibrium or long-run profitability level of *firm* (i) is given by:

$$P_{ip} = \hat{a}/(1 - \hat{\lambda}_i). \qquad (4a)$$

As Geroski (1990) notes, equation (4) is best regarded as a reduced form of a more elaborate structural model involving entry and exit of firms both of which depend on profits - to be more precise, on expected positive or negative 'excess' returns (relative to the long-term norm). However, the estimation of a full structural model is beset with difficulties, because of the classic latent variable problem: changes in profits are a function of the threat of entry, rather than entry itself. Even if no entry takes place, the threat of entry may induce firms to lower prices and profits as a strategic option. Indeed, in the limiting case, as Baumol *et al.* (1982) showed, even a monopolist may be compelled to charge competitive prices if there is sufficient entry and other conditions are met to make the market 'contestable'.

Equation (4), despite its limitations due to being a reduced form, has the virtue of not requiring any unobservable variables to map competitive dynamics. Nevertheless, it is important to note that equation (4) does not allow us to distinguish between different sources of persistency, specifically that which may arise from persistent monopoly power or because good management allows a firm to be continuously more efficient than others. Entry and exit forces which erode excess profits apply to both sources of such profits.

To sum up, for studying competitive dynamics and for measuring the intensity of competition in an industry or an economy, the following parameters estimated from equation (4) are of interest:

    a. The long-term equilibrium rates of profit P_{ip} of individual corporations in order to discover whether there are firms which have persistent above(or below)-the-norm (usually approximated by the average rate of return in a cross-section of firms) profits even in the long run.

    b. The speed of adjustment towards this long term level (λ). The higher the value of λ, the lower the speed of adjustment indicating the existence of various barriers to entry which permit persistently high profits (which may either be due to monopoly power or good management).

    c. The variance of U_{it} [$V(U_{it})$] indicates the effect of "luck" on corporate profits which is not expected to be persistent.

IV. Persistence of profits in emerging markets: Time Series Analysis{PRIVATE }

The methodology outlined above will be employed in this section to analyse the persistence of profitability in seven emerging markets; namely, Brazil, India, Jordan, Korea, Malaysia, Mexico and Zimbabwe. The data set employed in the analysis consists of annual

observations on profitability in a subset of the largest 100 corporations quoted on the emerging stock markets of these seven countries. The subset represents those firms in each country which have a common run of data in excess of 10 observations; firms with broken runs of data are excluded on the grounds that time series methods are inapplicable with such short time series[14].

Taking each country in turn, profitability in firm i at time t, P_{it}, i=1,...,m, t=1,...,T, is measured by the **return on assets**, defined as earnings after tax divided by total assets. Table 2 provides a summary of the profitability of firms for the chosen sample period within each country. These rates of return are broadly similar to those reported for the larger data set by Glen, Singh and Mathias (1999). They are also much the same as those found by other investigators for the same countries and time periods[15].

Following the practice of the studies for advanced countries, the regression analysis is undertaken on the transformed profitability measures $Y_{it} = P_{it} - P_t$, where P_t is the average of the P_{it} across firms. The measure Y_{it} represents the deviation of the profitability of firm i at time t from the profitability of all other firms in the country at that time. The analysis is based on second order autoregressive (AR) models of the form

$$Y_{it} = \alpha_i + \lambda_{1i} Y_{i(t-1)} + \lambda_{2i} Y_{i(t-2)} + \varepsilon_{it} \qquad (5)$$

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[14] A larger data set, incorporating all the 100 largest corporations in 10 emerging stock markets, was used, and is described in detail, in Glen, Singh and Mathias (1999). The three countries excluded from the analysis of the current paper, on the grounds that there are fewer than 10 time series observations for the corporations of these countries, are Argentina, Peru and Thailand.

for i=1,...,m and t=1,...,T, where α_i, λ_{1i} and λ_{2i} are coefficients and the ε_{it} are random errors. Given the relatively short time dimension of our data, it seems reasonable to restrict attention to second order AR models (and the empirical analysis shows that this a second order lag is sufficient to capture the dynamics in all cases).

The model of (5) provides a simple characterisation of the dynamics of profitability for each firm. If $\lambda_{2i}=0$ for all i, then the estimates of λ_{1i} provide a direct measure of the speed of adjustment of profitability following a shock. Assuming $\lambda_{1i} < 1$ (and the validity of this assumption is discussed below), adjustment to equilibrium is monotonic in this case, and profitability responds most quickly in firms with smaller values of λ_{1i}. Where λ_{2i} is not zero, however, adjustment to a shock can take place non-monotonically, and there is no unique way of characterising the speed of adjustment based on the estimated parameters. Hence, there is no unique ranking of firms' speeds of adjustment. In what follows, we shall concentrate on the measure $\lambda_i = \lambda_{1i} + \lambda_{2i}$ as an indication of the speed of adjustment. (This will, of course, be equal to λ_{1i} when λ_{2i} is zero).

Testing for the presence of unit roots

The first issue to address in the analysis of the persistence of profitability is whether there exists a unit root in the profitability data. The presence of a unit root would indicate that shocks to profitability persist indefinitely and that competitive pressures *never* erode differentials in profitability. The presence of a unit root implies that (5) can be written

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[15] See Annex to Claessens, Djankov and Lang (1998).

$$\Delta Y_{it} = \alpha_i + \theta_i \, \Delta Y_{i(t-1)} + \varepsilon_{it} \qquad (6)$$

where $\Delta Y_{it} = Y_{it} - Y_{i(t-1)}$, so that $\theta_i = \lambda_{1i}-1$, $-\theta_i = \lambda_{2i}$ and $\lambda_i = \lambda_{1i}+\lambda_{2i} = 1$. In the model of (6), a 1% increase in profitability in time t will result in profitability being $1/(1-\theta_i)\%$ higher at the infinite horizon than it would have been in the absence of the shock[16].

Investigating the presence of a unit root in the profitability series is an essential precursor to the analysis of the speed of adjustment of profitability in a model of the form (5), where stationarity is assumed. But there are difficulties: tests of the unit root hypothesis have notoriously low power and that problem is compounded in our case since we have only a small number of time series observations for each firm. However, a relatively powerful test of the unit root hypothesis is provided by Im et al (1997) in situations where the data under investigation also has a cross-section dimension, as here. The 'standardised t-bar test' proposed by Im et al. exploits the panel structure of the data and is based on the average value of the Augmented Dickey-Fuller statistic calculated for each of the individual firm's data, adf(i); i.e. the average value of the t-statistic on the coefficient β_i in the rewritten version of (5) given by the Dickey-Fuller regression:

$$\Delta Y_{it} = \alpha_i + \beta_i \, Y_{i(t-1)} + \gamma_i \, \Delta Y_{i(t-1)} + \varepsilon_{it} \quad (7)$$

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[16] In the time series literature, the measure $1/(1-\theta_i)$ is denoted the "persistence" of the shock; using this terminology, any stationary series, modelled by (5) with $\lambda_{1i}+\lambda_{2i}$ not equal to unity, has zero persistence as the effect of any shock dies away to zero at the infinite horizon. In the analysis here, following the industrial economics literature, we use the term 'persistence' to mean the speed of adjustment to equilibrium in a stationary model.

where, comparing the model with (5), $\beta_i = -[1-\lambda_{1i}-\lambda_{2i}] = -[1-\lambda_i]$ and $\gamma_i = -\lambda_{2i}$. In calculating the adf statistics, it is important that the ε_{it} do not display serial correlation. The inclusion of the lagged $\Delta Y_{i(t-1)}$ term is therefore potentially important although, given the relatively small samples involved, the inclusion of an unnecessary additional regressor is to be avoided if it makes no contribution to the regression. We therefore calculated two sets of tests of the unit root hypothesis in our seven countries; in the first (unrestricted) set, $\Delta Y_{i(t-1)}$ is included in all regressions while, in the second (parsimonious) set, the test is conducted on the basis of firms' regression chosen through a specification search in which the Schwarz-Bayesian Criterion (SBC) is calculated to decide whether or not to exclude the lagged $\Delta Y_{i,t-1}$ term. Im et al. show that the standardised t-bar statistic has a standard normal distribution when m and T are large and $\sqrt{m}/T$ is small. For smaller samples, they provide appropriate critical values obtained through Monte Carlo simulation against which to compare the standardised t-bar statistic.

Tables 3 and 4 summarise the relevant results obtained for each country in turn by estimating the model of (7) across all firms following the specification search described above. Table 3 shows the summary statistics for the distribution of the α_i, of the $\lambda_i = \lambda_{1i}+\lambda_{2i} = 1+\beta_i$ and of the adf_i across the firms for each country. The Table also provides summary statistics for the distribution of the Rbar-squared statistics obtained for each of the regressions in the parsimonious set obtained through the specification search and for the "long-run profitability" measure, $YLR_i = \alpha_i/(1-\lambda_i)$. Table 4 shows the standardised t-bar statistics obtained on the basis of the average values of adf_i in each country, plus the

 associated critical values obtained by interpolating between the relevant values for small sample sizes provided in Im et al (1997). To check on the role played by the specification search, we also calculated the average value of the adf$_i$ obtained for the unrestricted set of equations and these are also reported in Table 4 (denoted "t-bar statistic*").

The results are most interesting. **First**, we take note of the statistical adequacy of the reported regressions and note, from the statistics denoted "A", that the inclusion of the lagged ΔY_{it} term in the model is not required in the majority of the ADF regression but it is required in a significant minority. In this minority, tests and regression results obtained without including the extra dynamics would be misspecified. Further, we note, from the reported R-bar2 statistics and the statistics denoted "B" that the fit of the regressions are reasonable in most cases, with the country averages lying in the range [0.249, 0.418] and with the vast majority of individual regressions having R-bar2 in excess of 0.1. While the regression model of (7) is clearly very simple, these figures indicate that the estimated regression models are reasonably well specified and have explanatory power.

Second, we consider the results of the unit root tests of Table 4 and note that the unit root hypothesis is systematically rejected in all countries, whether we use the results obtained from the parsimonious set of equations or the unrestricted set. The panel unit root test therefore provides compelling evidence that the profitability series are stationary in levels, and that the effects of shocks to profitability do die away at least at the infinite horizon. It is worth emphasising that unit root tests typically lack power, and it is the panel structure of this data set which is exploited by the test of Im et al. And which allows us to draw the very strong conclusion that profitability data is levels stationary.

Third, we consider the issue of the speed of adjustment to equilibrium and, under the (statistically acceptable) assumption that profitability is levels stationary, look to the estimated values of λ_i described in Table 3. Subject to the reservations expressed earlier on the non-uniqueness of the measures in the presence of more than one lagged value of Y_{it} in (5), the mean values of λ_i provide an indication of the speed of adjustment and these are comparable to those obtained in other studies. Interestingly, most of the average values of λ_i for the seven countries are in the range [0.22,0.42], with Brazil being close to zero. The standard errors associated with the estimate of the mean value of the λ_i are relatively small, indicating that these overall measures are relatively precisely estimated. The estimates indicate a relatively rapid adjustment to equilibrium and certainly suggest adjustment durations less than those observed in the comparable studies of developed markets (see below).

Fourth and finally, we note the distribution of the long-run profitability figures, YLR_i. The mean value of the YLR_i estimates lie relatively close to zero and comparison with the associated standard error shows that there is no reason to believe this mean figure differs from zero in any country. However, the other statistics show that there is considerable variablity in the estimated YLR_i in some countries. This is because the YLR_i is estimated as a ratio of estimated parameters (i.e. $YLR_i = \alpha_i /(1-\lambda_i)$) and estimates of λ_i that lie close to unity can generate very large (and very imprecisely estimated) values of YLR_i. Even with this reservation in mind, however, it is worth noting that the statistics denoted "C" and "D" show that there are a relatively small number of firms for whom the long run level of profitability is significantly greater or less than zero.

The discussion on the long-run profitability estimates above notes that some of the estimated statistics of interest in Tables 3 and 4 are potentially distorted because estimates of λ_i are close to, or even greater than, unity. Their extreme value could have a disproportionate effect on the reported average values and result in incorrect inferences being drawn on the typical speed of adjustment. In fact, the statistic denoted "D" shows the number of point estimates of λ_i which lie outside the interval (-1, 1), meaning that the estimated regressions are unstable, and these indicate that instability arises in only a relatively small number of cases. However, to check on the sensitivity of the results to this problem, we also eestimated the regression models imposing the constraint that the value of λ_i lies within the interval (-1, 1).[17] The results are much the same as those in Table 2, but some of the extreme outlying values have disappeared from the Table.[18]

Finally, Table 5 provides cross-correlation statistics, calculated across the firms in each country, for the variables λ_i, YLR_i, Y_{i0} and $Y_{i.}$, where Y_{i0} is the measure of profitability in the first year of the sample and $Y_{i.}$ is the average value of Y_{it} over the sample.

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[17] This is achieved by noting that (5) can be re-written in a Moving Average (MA) version $Y_{it} = \mu_i + u_{it}$, where $u_{it} = \lambda_{1i} u_{i(t-1)} + \lambda_{2i} u_{i(t-2)} + \varepsilon_{it}$ and where $\mu_i[1-\lambda_{1i}-\lambda_{2i}] = \alpha_i$. Written in this form, the model can be estimated using exact maximum likelihood methods to impose the constraint that $1<\lambda_{2i}<-1$.

[18] Hence, for example, the mean value of the λ_i across firms is 0.025, 0.261, 0.335, 0.310, 0.369, 0.214, 0.421 in Brazil, India, Jordan, Korea, Malaysia, Mexico and Zimbabwe respectively.

V. Persistence of Profitability and Intensity of Competition.

As indicated earlier, in order to draw conclusions for the nature and degree of competition in the sample emerging markets from the results of the time-series analysis above, it is necessary to examine for each country the distribution of three parameters - λ, YLR and 2^2. Considering λ first, the mean value varies between 0.013 for Brazil and 0.421 for Zimbabwe, suggesting that the latter has lower intensity of competition than the former. The speed of adjustment to excess short-run profits for the average firm would appear to be considerably lower in Zimbabwe than in Brazil. However, it may be useful to bear in mind that even a value of λ of 0.5 implies a fairly rapid convergence: for a firm with profits 10% above the norm, a λ value of 0.5 would suggest that the excess profits will be reduced to 1% within three years.

The results reported in Table 3 also show that for most countries the mean YLR is nearly zero – in other words, for the average firm, there are no long-run excess profits. This of course leaves a considerable number of firms which do make long-term excess profits in perpetuity as it were. Overall, the picture which emerges from the analysis of the distributions of λ, YLR and R^2 in Table 3 is that competition is more intense in Brazil, Mexico and India than in Korea, Jordan and Malaysia. The least competitive country in this sample is Zimbabwe, but as indicated above, even in this case evidence suggests that excess short-term profits are competed away quite rapidly.

How do the developing countries' product markets compare in relation to the degree of competition with those in advanced countries? Table 6 reports the average values of λ

obtained by various studies for industrial countries. Table 7 reproduces for purposes of comparison the mean values of λ, YLR and 2^2 for the sample of emerging markets considered in this study. The results with respect to λ suggest that the speed of adjustment to excess profits for the average firm in developing countries is faster than that in advanced countries; in any case, it is no slower. Similar conclusions are reached in comparisons of YLR and other indicators of intensity of competition (e.g. the correlation between YLR and the initial profitability) for all industrial countries for which comparable information is available. One of the studies for industrial countries which is closest to ours is that of Geroski and Jacquemin (1988). In this paper they examine the relative intensity of competition in the UK, France and West Germany. The λ values they obtain from their analysis of the persistence of profitability in 55 French, 28 West German and 51 UK firms are reported in Table 6 above. Their results for the average value of YLR and R-BAR^2 are as follows:

	France	Germany	UK
YLR	0.022	0.11	0.219
R-BAR^2	0.489	0.377	0.694

Comparing these results with those summarised in Table 7, suggests that the intensity of competition, measured by different indicators of the persistency of profits, is no less in emerging markets examined here (including the Asian crisis countries) than in advanced industrial countries.

For many this may appear to be a counter-intuitive conclusion. Before commenting on that aspect it may be useful to consider the possible biases which could, in principle, have

produced this overall result. The first issue concerns the limited length of our time-series samples. This would impart a downward bias to our reported results for λ in Table 3 and Table 7. However, there is a fairly straight-forward correction to this bias which would at most count for 10% of the difference between the values of λ reported for the two groups of countries[19].

Secondly, there is a clear survivorship bias in that the emerging market firms being analysed in this study are all those which survived. However, a similar bias operates in the case of most studies reported in Table 6 for industrial country corporations as well. In view of the lack of necessary information, it is difficult to obtain precise estimates of the extent of this bias. Nevertheless, there is one piece of evidence which suggests that the survivorship bias may be less for emerging markets than for industrial countries. Studies contained in Roberts and Tybout (1996) suggest that the incidence of the entry and exit of new firms is generally greater in developing than in advanced economies. This would indicate that if there was data available for all firms, whether they survived or not, other things being equal, developing country corporations would display an even lower degree of persistency compared with industrial country corporations.

A third source of bias in this study could arise from the fact that persistency regressions reported in this paper are based on accounting rates of return rather than on economic profits (see Fisher and McGowen (1983)). Mueller's (1990) analysis of this issue suggests that this bias is unlikely to be important in persistency studies. As Geroski and Jacquemin observe:

"It seems reasonable to think that persistently high accounting rates of return indicate persistently high economic rates of return". Moreover, it is not clear that this potential bias would necessarily be greater in studies of emerging markets than in advanced countries.

Returning to the question of the plausibility of these results, it was noted earlier that many serious scholars regard countries like Korea to be intensely competitive. This need not mean that the managers are necessarily maximising share-holder wealth: more likely, as suggested in a number of studies[20], they may be maximising market share instead. Moreover, as mentioned before, the competition may be contest-based rather than being market-based.

Another important reason for accepting the plausibility of these results is that there is evidence that the new entry of firms is relatively greater in developing countries' product markets than those of advanced economies. Large corporations in industrial countries have long created barriers to entry through advertising, patents, trade-marks, etc. These inhibit potential competition from new firms. In contrast, developing countries are growing fast and undergoing enormous technical and structural change. These conditions provide additional incentives for new entry and greater competition.

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[19] See further Geroski and Jacquemin (1990) who following Johnston (1972) suggest a correction for the bias to consist of multiplying estimated coefficients by T/(T-2), where T is the number of observations in the sample.
[20] See further Amsden (1989), Singh (1998b) and Odagiri (1994)

VI. Stock market Development and Corporate Finance in India – Stylised facts.[21]

This section briefly reports on the expansion of the stock market and the financing of corporate growth in India during the last two decades, in order to examine their implications for the analytical issues outlined in sections II.2 and II.3.

The stylised facts for the Indian economy in these spheres may be summarised as follows:

a) While the Indian stock market was founded more than a century ago, from independence in 1947 up until the 1980s it had remained a sleepy backwater in the Indian financial system, with little scope for expansion in a regime dominated by state-directed credit. In 1980, the capitalization ratio was only 5%. As a result of liberalization measures initiated in the 1980s, by 1990, the ratio had risen to 13%. After the major change in government policy and the acceleration of the pace of liberalization in 1991, stock market growth was explosive. By the end of 1993, total market capitalization had reached 40% of GDP.

b) The number of shareholders and investors in mutual funds rose from 2 to 40 million over 1980-93. This made the Indian investor population the second largest in the world, second only to the U.S. which had about 51 million investors.

c) However, in terms of the number of companies listed on the stock markets, the Indian stock market by the end of 1995 was the largest in the world, with nearly 7,985 listed companies. This surpassed the 7,671 listed domestic companies on U.S. exchanges and far exceeded those of the U.K. and Germany with 2,078 and 678 listed companies, respectively.

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[21] This section is based on Singh 1998a, and Singh and Weisse 1998.

d) On the largest Indian stock exchange at Bombay, the daily turnover of shares increased almost 30-fold during the 1980s and early 1990s – from 0.13 billion rupees in 1980-81 to 3.7 billion rupees in 1993-94. The average daily trading volume on the Bombay stock market in the early 1990s was about the same as that in London – about 45,000 trades a day. At the peak of stock market activity trading occurred at double that rate. As these deals put through in a short period of 2 hours, the Bombay stock exchange was reported to have the highest density of transactions in the world, behind only that of the Taiwan stock exchange (Mayya, 1995).

e) During the 1980s and the first half of the 1990s, Indian corporations raised large amounts of capital on a very active primary market to finance their growth. In 1980, Rs 929 m. were raised through corporate securities issuance (Balasubramanian, 1993). This figure had risen to Rs 2.5 bn by 1985, to a huge Rs 123 bn by 1990, and by 1993-4, it reached Rs 225 bn, i.e. a 250-fold increase since 1980. By contrast the general price level rose less than fourfold during this period. Another indicator of an extremely acative primary market was that in 1994-5 nearly 1700 companies raised equity capital (either through direct offerings to the public or through rights issues); of these, 369 were new companies (RBI, 1995).

f) In the first large scale empirical studies of corporate finance in developing countries, Singh and Hamid (1992) and Singh (1995) examined the financing of corporate growth in ten industrialising economies (including India) during the 1980s at a microeconomic level. The results indicated that developing country firms rely heavily on a) external finance, and b) within external finance, to an unexpectedly large degree, on equity finance. The results for India indicated that the average Indian corporation, during the

1980s, financed about 40 per cent of its growth of 'net assets' (the long-term capital employed in the firm) from internal sources (i.e. retained profits) and 60 percent from external sources. Of the latter, nearly a third came from equity issues and two-thirds from long-term debt.

g) Although Indian stock market growth during the 1980s and 90s has been impressive, so has it been in several other leading emerging markets. In Taiwan, market capitalization as a proportion of GDP rose from 11 per cent in 1981 to 74 per cent in 1991. Similarly, between 1983 and 1993, the Chilean ratio rose from 13.2 to 78 per cent and the Thai from 3.8 to 55.8 per cent. To put these figures in an historical perspective, Mullins (1993) notes that it probably took the US stock market 85 years (1810-95) to achieve a broadly similar increase in capitalization ratio, from 7 to 71 per cent.

h) A severe liquidity crisis in 1990 obliged the Indian government to change course and it greatly accelerated the process of liberalisation which had started in the 1980s. However, the Indian economic reforms of the 1990s have not only been associated with the vast expansion of stock market activity, but also with important steps to improve the functioning of the markets, to make them more transparent, and less subject to insider dealing and fraud. Although the newly-appointed regulatory authority, the Securities and Exchange Board of India (SEBI), has apparently made some progress in a number of these areas, it will be a long time before the Indian stock market loses its justly deserved reputation of being a "snake pit" to use Joshi and Little's expressive phrase. Indeed, notwithstanding SEBI's valiant efforts the Indian press continues to regale stories of fresh stock market scams. One leading Indian magazine wrote not so long ago

that market regulation is almost non-existent and that the financial markets have become as a consequence a "virtual freeway".[22]

The above observations about the expansion of the stock market and the large use of external finances, including equity finance, by Indian and other developing country firms certainly contradict a priori expectations about corporate finance in emerging markets outlined in Section II.2. The reasons for these anomalous results are explored elsewhere[23] and will not be commented upon except to suggest that the important question raised by Schleifer and Vishny (1997) in their excellent survey on corporate governance still remains important. The two authors rightly asked : "how can firms raise equity finance in countries with virtually no protection of minority investors, even if these countries are rapidly growing?" They went on to enquire: "Who are the buyers of these equities? If they are dispersed shareholders, why are they buying the equity despite the absence of minority protection?" These questions, as the Indian case above illustrates, still require a satisfactory answer.

Equally importantly, these facts also raise some interesting issues for the current research on law, finance and corporate governance referred to earlier. What the Indian case suggests is that there can be very quick but far-reaching changes in corporate finance such as those which occurred in the country during the 1980s and in the early 1990s. There was, however, no fundamental change in the basic legal framework or in the principles of company law, or for that matter in the degree of enforcement. The government changed economic policy and

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[22] *India Today* (June 16, 1997).
[23] Singh (1995); Singh and Weiss (1998)

direction in the 1980s and the long dormant stock market came alive. It turned into an important source for financing corporate growth as well as providing a vehicle for the savings of households. A similar mixture of changes in government policy and external economic environment occurred in a number of other emerging markets as well during the 1980s, leading to a very fast expansion of stock market activity: this happened both in civil law and in common law countries such as India. In other words, what is being suggested is that for the kind of huge changes which occurred in a number of countries in corporate finance and stock market activity in the 1980s, differences over time within the same country are more important than differences between countries and their basic legal systems.

VII.   Conclusion.

The main purpose of this paper has been to report on investigations into the dynamics of the competitive process and the intensity of competition in emerging markets by time-series analysis of corporate rates of return. This is very much work in progress. We shall go on to look at further aspects of competition and corporate governance. One area for immediate investigation is the determinants of inter-country and inter-firm differences in the persistency coefficients. This will, inter alia, involve examining the relationship between profits persistence and directly observable corporate governance variables. Similarly, our work on the financing of corporate growth is examining the changes which occurred in the 1990s in this sphere. The results of this research will be reported in future papers.

Table 1. Concentration Ratios in Emerging Economies

Economy	*Three-firm concentration ratios*
	Share
Japan, 1980	56
Korea, Rep. of, 1981	62
Taiwan, China, 1981	49

	Four-firm concentration ratios
Argentina, 1984	43
Brazil, 1980	51
Chile, 1979	50
India, 1984	46
Indonesia, 1985	56
Mexico, 1980	48
Pakistan, 1985	68
Turkey, 1976	67
United States, 1972	40

Source: World Bank 1993

Table 2

Rates of return (after tax) on total assets in seven emerging markets

(For the data set used in Persistency Regressions)

	No. Firms	Mean	St. Dev	Min.	Max.
Brazil 1985-1995	56	0.041	0.053	-0.087	0.158
India 1982-1992	40	0.121	0.041	0.073	0.295
Jordan 1980-1994	17	0.090	0.046	0.018	0.213
Korea 1980-1994	82	0.095	0.022	0.048	0.174
Malaysia 1983-94	62	0.089	0.044	0.015	0.215
Mexico 1984-1994	39	0.090	0.047	-0.018	0.201
Zimbabwe 1980-1994	40	0.143	0.046	0.057	0.266

Table 3
Summary of results on the estimated Augmented Dickey-Fuller regressions
(following a specification search using SBC)

	α_i	λ_i	adf_i	$Rbar2_i$	YLR_i
Brazil					
Mean	-0.001 (0.005)	0.013 (0.050)	-2.743	0.418	0.003 (0.050)
Median	0.005	-0.064	-2.794	0.433	0.005
St. dev.	0.071	0.345	1.009	0.187	0.060
Min.	-0.189	-0.648	-5.577	0.045	-0.136
Max.	0.118	0.753	-0.826	0.790	0.120

(A = 47/56 firms, B = 54/56 firms, C = 1/56 firms, D = 3/56 firms, E = 0/56 firms)

	α_i	λ_i	adf_i	$Rbar2_i$	YLR_i
India					
Mean	0.003 (0.003)	0.221 (0.059)	-2.180	0.326	0.000 (0.192)
Median	-0.004	0.226	-2.200	0.324	-0.009
St. dev.	0.052	0.433	1.187	0.255	0.062
Min.	-0.078	-0.561	-4.683	-0.113	-0.151
Max.	0.269	1.097	0.437	0.906	0.234

(A = 28/40 firms, B = 29/40 firms, C = 2/40 firms, D = 4/40 firms, E = 1/40 firms)

	α_i	λ_i	adf_i	$Rbar2_i$	YLR_i
Jordan					
Mean	0.008 (0.005)	0.348 (0.063)	-2.447	0.299	0.051 (0.099)
Median	-0.004	0.333	-2.500	0.300	-0.008
St. dev.	0.040	0.318	1.003	0.167	0.214
Min.	-0.028	-0.289	-4.399	-0.091	-0.059
Max.	0.121	0.989	-0.060	0.605	0.860

(A = 13/17 firms, B = 15/17 firms, C = 1/17 firms, D = 0/17 firms, E = 0/17 firms)

	α_i	λ_i	adf_i	$Rbar2_i$	YLR_i
Korea					
Mean	0.001 (0.001)	0.323 (0.030)	-2.568	0.300	0.005 (0.462)
Median	0.001	0.359	-2.426	0.289	0.002
St. dev.	0.018	0.381	1.694	0.226	0.037
Min.	-0.026	-0.557	-10.728	-0.090	-0.048
Max.	0.056	1.146	0.874	0.905	0.205

(A = 63/82 firms, B = 64/82 firms, C = 7/82 firms, D = 2/82 firms, E = 3/82 firms)

Malaysia

Mean	-0.001 (0.002)	0.349 (0.037)	-2.326	0.302	0.009 (0.080)
Median	-0.001	0.340	-2.288	0.297	-0.001
St. dev.	0.042	0.319	1.090	0.219	0.067
Min.	-0.100	-0.402	-6.217	-0.096	-0.106
Max.	0.148	0.943	-0.456	0.807	0.336

(A = 42/62 firms, B = 46/62 firms, C = 4/62 firms, D = 7/62 firms, E = 0/62 firms)

Mexico

Mean	-0.005 (0.004)	0.222 (0.056)	-2.269	0.316	-0.002 (0.238)
Median	-0.005	0.254	-2.126	0.252	-0.007
St. dev.	0.041	0.281	0.797	0.182	0.048
Min.	-0.105	-0.430	-3.938	-0.029	-0.115
Max.	0.062	0.750	-0.880	0.645	0.132

(A = 34/39 firms, B = 36/39 firms, C = 0/39 firms, D = 0/39 firms, E = 0/39 firms)

Zimbabwe

Mean	-0.005 (0.003)	0.421 (0.042)	-2.225	0.249	0.157 (4.048)
Median	-0.003	0.507	-2.006	0.201	-0.000
St. dev.	0.043	0.338	1.097	0.182	0.977
Min.	-0.169	-0.839	-5.473	-0.076	-0.092
Max.	0.076	1.006	0.037	0.723	6.171

(A = 31/40 firms, B = 32/40 firms, C = 0/40 firms, D = 4/40 firms, E = 1/40 firms)

Notes:

Coefficients α_i, λ_i refer to the parameters of the Dickey-Fuller regression of (7) in the text, where $\lambda_i = \beta_i - 1$. The adf_i are the t-values associated with β_i in the same regressions, and the Rbar-2$_i$ also relate to these regressions. YLR$_i$ = $\alpha_i/(1-\lambda_i)$. The reported statistics refer to the distribution of the statistics across the firms within the country. (Standard errors are in parentheses).

The reported regressions are the outcome of a specification search in which γ_i is set equal to zero according to the SBC.

"A" shows the number of firms for which $\gamma_i = 0$ in each country. "B" shows the number of firms for which Rbar-squared exceeds 0.1. "C" shows the number of firms for which YLR$_i$ is significantly positive (working at the 5% level of significance) and "D" shows the number of firms for which YLR$_i$ is significantly negative. "E" shows the proportion of regressions which are dynamically unstable.

Table 4
Standardised t-bar test statistics for the Im et al unit roots tests based on adf_i and $adf_i*^{(a)}$

	t-bar stat	[t-bar stat*][a]	(95%, 90% critical values)[b]
Brazil	-7.885	-5.198	(-1.70, -1.75)
India	-3.659	-2.175	(-1.75, -1.79)
Jordan	-3.855	-3.101	(-1.90, -1.82)
Korea	-9.558	-6.327	(-1.70, -1.66)
Malaysia	-6.130	-4.783	(-1.76, -1.71)
Mexico	-4.042	-1.971	(-1.75, -1.79)
Zimbabwe	-4.519	-3.661	(-1.78, -1.71)

(a) Average values of the adf_i for the unrestricted set of equations (reported here to assess the role of the specification search).

(b) Obtained by interpolation between the relevant values for small samples provided in Im et al.

Table 5
Cross-correlation statistics

	λ_i	YLR_i	Y_{i0}	$Y_{i.}$
Brazil	1.000	0.160	0.144	0.060
		1.000	0.099	0.939
			1.000	0.354
				1.000
India	1.000	0.105	0.002	0.164
		1.000	0.018	0.531
			1.000	0.327
				1.000
Jordan	1.000	0.391	0.376	0.581
		1.000	0.072	0.259
			1.000	0.619
				1.000
Korea	1.000	0.173	0.043	0.138
		1.000	0.254	0.570
			1.000	0.475
				1.000
Malaysia	1.000	0.289	0.154	0.061
		1.000	0.207	0.638
			1.000	0.697
				1.000
Mexico	1.000	0.253	0.008	0.298
		1.000	0.300	0.911
			1.000	0.559
				1.000
Zimbabwe	1.000	0.298	0.099	0.328
		1.000	0.321	0.258
			1.000	0.537
				1.000

Table 6. Summary of previous persistence of profit studies

Author	Country	Sample Period	Observations per firm	Number of firms	Sample mean (Lamda [i]
Geroski and					
Jacquemin (1988)	UK	1947-77	29	51	0.488
	France	1965-82	18	55	0.412
	West Germany	1961-81	21	28	0.410
Schwalbach et.al (1989)	West Germany	1961-82	22	299	0.485
Mueller (1990)	US	1950-72	23	551	0.183
Cubbin and Geroski (1990)	UK	1948-77	30	243	0.482
Khemani and Shapiro (1990)	Canada	1964-82	19	129	0.425
Odagiri and Yamawaki (1990)	Japan	1964-82	19	376	0.465
Schohl (1990)	West Germany	1961-81	21	283	0.509
Kambhampati (1995)b	India	1970-85	16	42	0.484

a - Based on nominal profit on capital, before tax
b – Estimations are for industry groups. Estimates of lamda are from a range of specifications for the persistence model, which differ across industries.
Source – Goddard and Wilson (1999)

Table 7

Mean values of λ, YLR and 2^2.

	Mean λ	Mean YLR	Mean 2^2
Brazil	0.013	0.003	0.418
India	0.229	0.003	0.282
Jordan	0.348	0.05	0.299
Korea	0.323	0.005	0.3
Malaysia	0.349	0.009	0.302
Mexico	0.222	-0.002	0.316
Zimbabwe	0.421	0.157	0.249

Source: Table 2 above.

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