Size Matters: Capital Market Size and Risk-Return Profiles

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May 2007 – PRELIMINARY ONLY. PLEASE DO NOT QUOTE

Abstract: In this paper we propose a simple approach that allows us to track the impact of capital market size on the risk/return profile of capital markets. The thought motivating the study is that markets of different size ought to behave differently even when they are composed of agents whose risk attitudes are all alike. Smaller, or shallower, markets are less able to pool and spread risks than are deeper markets and we might expect this to be reflected in the observed risk/return profiles of capital markets of differing size. The paper's ultimate aim is to show why a small-to-medium sized capital market such as Australia's might be less willing to subscribe risky ventures than larger markets even if the same investment opportunities were available to both types of market and the stakeholders in both markets have similar attitudes to risk. A corollary of this proposition is that R&D activity – which is a form of investment in relatively risky activity – might be expected to be proportionately larger in an economy with a large capital market than is the case in a small capital market.

Key Words: risk-return, Arrow-Lind theorem, risk spreading, capital market size.

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1 Introduction

It is a well known proposition of the theory of finance that, as the membership of an insurance syndicate is increased (where each member of the syndicate is risk averse and where his income is uncorrelated with the payoffs of the syndicate) then the syndicate tends to act in a manner that approaches risk neutrality, and that the syndicate acts in a risk neutral manner as the membership tends to infinity. The logic underlying this proposition is relatively easy to grasp. As the population of a syndicate is increased, two opposing effects occur. The first tends to undercut the incentive to take on risks, as the increase in an insurance syndicate's population dilutes the rewards to each member. The second effect tends to encourage increased risk-taking by the syndicate, as it diminishes the risk faced by each individual and this itself tends to encourage greater risk-taking. Ultimately, as membership rises, the second effect is the stronger because the risk borne by each syndicate member declines at a faster rate than the reduction in each member's mean income. As a result, larger insurance syndicates are generally able to insure larger corporate risks because the risks faced by individuals within the syndicate are smaller than they are for members of smaller syndicates.

If we think of capital markets as performing a quasi-insurance function for the investors who compose it (by allowing them to share risks), the above intuitive result finds support, *prima facie*, in the relationship between the market capitalisation and the corresponding risk per capita of 35 stock markets of developed and developing countries during 1988-2005, as illustrated in Figure 1.

FIGURE 1   AVERAGE MARKET CAPITALISATION AND RISK PER CAPITA: 1988-2005
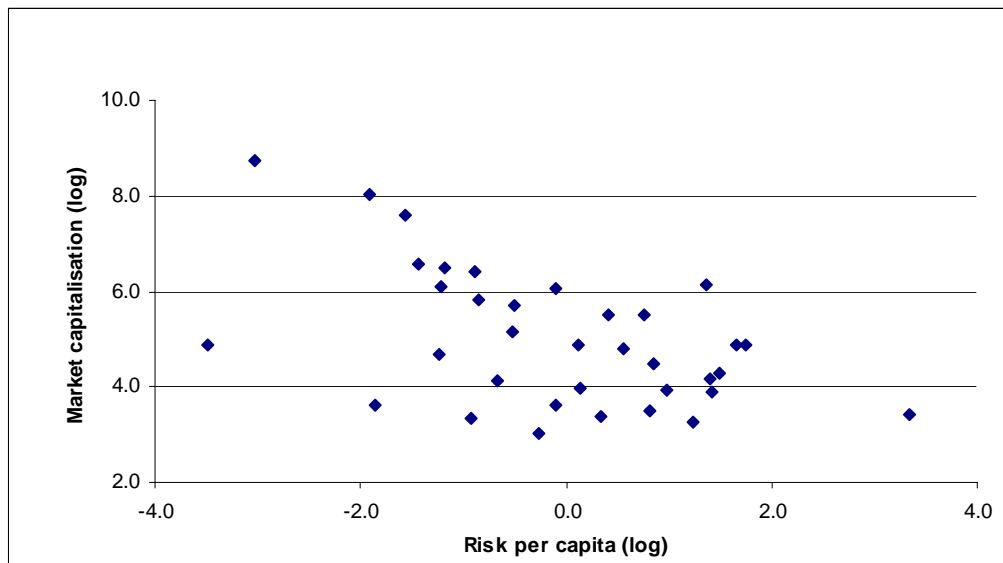
As the functions of the stock market include providing firms with the ability to insure risky production activities, the negative relationship emerging from Figure 1 (coefficient: -.516), if proven, has significant implications for research and innovation policies, particularly in small open economies. Specifically, it has implications for the location and cost of public offerings of innovative firms.

To study the extent to which the size of capital markets may affect the willingness of stock markets to underwrite risky production activity by firms, and hence whether large stock markets subscribe greater risk taking by firms than small stock markets, we proceed as follows. We first briefly review the literature prior to developing a theoretical framework to derive testable propositions in Section 3. In Section 4 we illustrate our empirical approach and present the empirical analysis obtained on data sourced from the Global Financial Database and the International Financial Statistics of the International Monetary Fund for a number of countries for the period 1988-2005. Section 5 discusses implications and concludes.

2   Literature review and preliminary discussion

A natural point to start discussion about the impact of size on capital market performance is the capital asset pricing model of Sharpe (1964) and Lintner (1965).[1] For that model, Lintner (1970) showed that an increase in the size of the market – whether measured by an increase in the number of stockholders or in the wealth of each – results in greater "risk tolerance" of the market as a whole. This is to say that, as the market size increases, the degree of risk aversion of the market as a whole falls, and, accordingly, the price of risk also falls.[2] In the limit, as the number of investors goes to infinity, the market acts as if it were risk neutral – i.e. the price of risk falls to zero. The reason for this "risk elimination" is the greater ability of investors to diversify the risks held by any one of them and the concomitant decline in the total risk borne by all the stockholders in the market as the number of investors increases. In the limit, the risk borne by each investor falls to zero. The result is analogous to the "risk spreading" proposition in the public sector context of Arrow & Lind (1970).

In the same paper Lintner also showed that, under certain conditions, the behaviour of a competitive asset market could be modelled 'as if' there were a single 'mutual fund' or 'syndicate' maximising the aggregate welfare of the market as a whole. This is so regardless of whether there is a riskless asset or not (Lintner, 1969). The conditions that apply are that each stockholder has a constant degree of risk aversion and that all stockholders' judgments as to the distribution of returns are the same.

Utilising this construction allows us to draw out an interesting corollary of the fact that aggregate risk attitude falls as market size increases.

Suppose that there are two syndicates of different size that face the same 'universe of risks' (i.e. the same set of portfolio choices represented on the (μ, σ^2) plane, where the frontier of risks is not upper-bounded, and where the returns are normally distributed). Furthermore, suppose that each member of each syndicate has the same income and preference profile as that of any other member of that syndicate (i.e. each

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[1] Although there are well known problems with the empirical validity of the model (Fama & French, 1992), especially in the case of international capital market comparisons (Erb, *et al*, 1997, p.9), the model is familiar and sufficiently robust to form the foundation for discussion.

[2] Strictly speaking, Lintner showed this for the class of utility functions in which risk tolerance is linearly related to wealth. The discussion in Budd & Litzenberger (1972) and Lintner (1972) clarifies the issue.

member is a 'representative agent' of his syndicate), and that that each member is attempting to maximise:

$$U = -\exp[-A(\overline{x} - A.\mathrm{var}(x)/2] \qquad (1)$$

(where x denotes the agent's end-of-period wealth which is normally distributed with mean, $\overline{x}$, and variance, var(x); and where A measures the constant degree of risk aversion). Finally, suppose that members of the two different syndicates may have different degrees of risk aversion. Then, given the fact that, in the larger syndicate, stakeholders are better able to disperse risk, we can derive the following comparative static propositions by way of revealed preference arguments:

i) if the larger syndicate chooses a portfolio with a smaller variance than that chosen by the smaller syndicate, then the population of the larger syndicate must be the more risk averse

iia) if the larger syndicate chooses a portfolio with a larger variance than that chosen by the smaller syndicate, but the ratio of the variance to the mean return faced by each member of the larger syndicate is smaller than that of the smaller syndicate, then the population of the larger syndicate must be more risk averse than the population of the smaller syndicate

iib) if the larger syndicate chooses a portfolio with a larger variance than that chosen by the smaller syndicate, and the ratio of the variance to the mean return faced by each member of the larger syndicate is larger than that of the smaller syndicate, then the population of the larger syndicate must be less risk averse than the population of the smaller syndicate.

If we denote the larger syndicate as syndicate *I* and the smaller as syndicate *II*, then we can re-state the above propositions symbolically:

i) $\qquad \sigma_I^2 < \sigma_{II}^2 \Rightarrow$ syndicate *I* is more risk averse than syndicate *II*

iia) $\qquad \sigma_I^2 > \sigma_{II}^2 \ \& \ \dfrac{\sigma_I^2/n_I^2}{\mu_I/n_I} < \dfrac{\sigma_{II}^2/n_{II}^2}{\mu_{II}/n_{II}} \Rightarrow$ syndicate *I* is more risk averse than syndicate

II

iib) $\sigma_I^2 > \sigma_{II}^2$ & $\dfrac{\sigma_I^2/n_I^2}{\mu_I/n_I} \geq \dfrac{\sigma_{II}^2/n_{II}^2}{\mu_{II}/n_{II}} \Rightarrow$ syndicate *I* is less risk averse than syndicate *II*

(where μ = the mean return for the syndicate as a whole; and σ^2 = the variance of returns for the syndicate as a whole, and we note that $\bar{x} = \mu/n$ and $\mathrm{var}(x) = \sigma^2/n^2$).

Thus, if two economies face the same universe of risk, we have a test for the relative degree of risk aversion of the two sets of investors. Of course, economies of different size do not generally face the same (unconditional) universe of risk. Rather, they face universes that are conditioned on size (among other things). So practical testing of different risk attitudes in different markets utilising aggregate level data is only possible once the impact of market size on the set of available assets is modelled. In this paper, we concentrate on assessing the impact of market size on the risk-return performance of markets on the assumption that all investors in all markets share the same attitude to risk; and we leave to future study the analysis of the issue of whether some capital markets are manifestly composed of more risk averse investors than others. This is consistent with our immediate objective of ascertaining whether the differential risk-return performance of capital markets of different size can be accounted for even when all agents have similar degrees of risk aversion.

3   Analysis

To begin to understand the way in which capital market size might impact on performance, we propose a highly simplified model, the purpose of which is to allow us to get a handle on the fundamental issues in play. The model supposes the following.

First, we assume that each capital market operates so as to maximise the utility of the agents who compose it. This is to say, we let each nation's capital market effectively operate as a kind of mutual fund for its stakeholders, and the portfolio of assets that is chosen by each market is the one that maximises welfare given available capital. This supposition is warranted by the earlier discussion; specifically, since competitive asset markets that efficiently allocate capital can be modelled in such an 'as if' fashion, and since it is simplest to proceed on such a basis, it is convenient to do so.

Second, it is assumed that all markets have the same risk attitude as captured by their coefficients of absolute risk aversion. This presupposes that the distribution of degrees of risk aversion across each population is the same. In other words, no country has a disproportionate preponderance of relatively more or less risk averse types vis-à-vis any other country. This may or may not be the case in reality, as noted at the end of the previous section; but there are no *a priori* grounds for thinking that one or another country is, on the whole, more or less risk averse than another, and so we adopt the assumption on the premise of the principle of insufficient reason.[3]

Third, markets are assumed to inhabit the same universe of risk conditioned on size; which is to say, all markets of any given size are assumed to have access to the same sets of assets. The idea underlying this supposition is that no country of equal size to another lacks the ability to access the same range of assets as the other – there are no technical, or educational or other institutional impediments giving rise to some assets being unavailable. This motivation parallels that which underlies the New Trade Theory: the kinds of firms of any two nations of interest are essentially similar (or at least are symmetrical in nature), and this is reflected in their production activity and risk characteristics (see Lancaster, 1980, and Krugman, 1979). Since this assumption cannot expect to hold for developing or emerging economies, adopting it limits our attention to developed countries.

Finally, it is assumed that returns are normally distributed. As with the previous assumption, this restricts attention to developed capital markets.

The problem facing the capital market is as follows:

$$\max_{\mu,\sigma^2} u = \mu - b.\sigma^2 \text{ subject to } \mu = F(\sigma^2)$$

where $b = A/2$ = half the coefficient of absolute risk aversion (A); μ = the mean rate of return; σ^2 = the variance of returns; and $F(.)$ represents the range of portfolios that a capital market of size K can afford (where K = the market cap) with $F' > 0, F'' \leq 0$.

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[3] Keynes (1921, pp. 52-53) referred to the principle of insufficient reason as the principle of indifference, formulating it as: "if there is no known reason for predicating of our subject one rather than another of several alternatives, then relatively to such knowledge the assertions of each of these alternatives have an equal probability".

Solving this in the usual manner gives three first order conditions: $\lambda = 1$, $b = F'(\sigma^2) = F_{\sigma^2}$, and $\mu = F(\sigma^2)$, where $\lambda =$ the Lagrange multiplier.

Given the last condition and the fact that the position of the frontier is determined by the size of the capital market, K, yields: $\frac{d\mu}{dK} = \left(F_{\sigma^2}\right)\frac{d\sigma^2}{dK}$. Multiplying by $K/\left(\mu.\sigma^2\right)$ and rearranging gives:

$$\varepsilon_{\mu\sigma^2} = \frac{\varepsilon_{\mu K}}{\varepsilon_{\sigma^2 K}} \qquad (2)$$

where $\varepsilon_{\mu\sigma^2} =$ the elasticity of the mean-variance frontier; $\varepsilon_{\mu K} =$ the elasticity of mean return with respect to capital market size; $\varepsilon_{\sigma^2 K} =$ the elasticity of variance with respect to capital market size. This last equation implies that the greater is $\varepsilon_{\mu K}/\varepsilon_{\sigma^2 K}$, i.e. the greater is the capacity of the market to generate expected returns as its size increases relative to its capacity to sustain risk as its size increases, then the greater is the elasticity of the mean-variance frontier.

To grasp the comparative static implications of this, recall the second first order condition to obtain:

$$\mu = \left(\frac{b}{\varepsilon_{\mu\sigma^2}}\right)\sigma^2 \qquad (3)$$

Hence, if market capitalisation rises whilst risk attitudes (given by b) are constant, the mean-variance ratio (μ/σ^2) will be lower at the optimum the greater is $\varepsilon_{\mu\sigma^2} = \varepsilon_{\mu K}/\varepsilon_{\sigma^2 K}$. Hence μ/σ^2 is lower the greater is the market's capacity to generate mean returns relative to its capacity to sustain risk as its size increases. The reason for this is that, as agents pursue the greater returns that are available, they experience declining marginal expected returns as greater risk is absorbed, and this drives down the relative mean-variance ratio (see Figures 2 and 3). The case of low $\varepsilon_{\mu K}/\varepsilon_{\sigma^2 K}$ may be referred to as a 'relative-variance displacement' and the case of a high $\varepsilon_{\mu K}/\varepsilon_{\sigma^2 K}$ as a 'relative-mean displacement'.

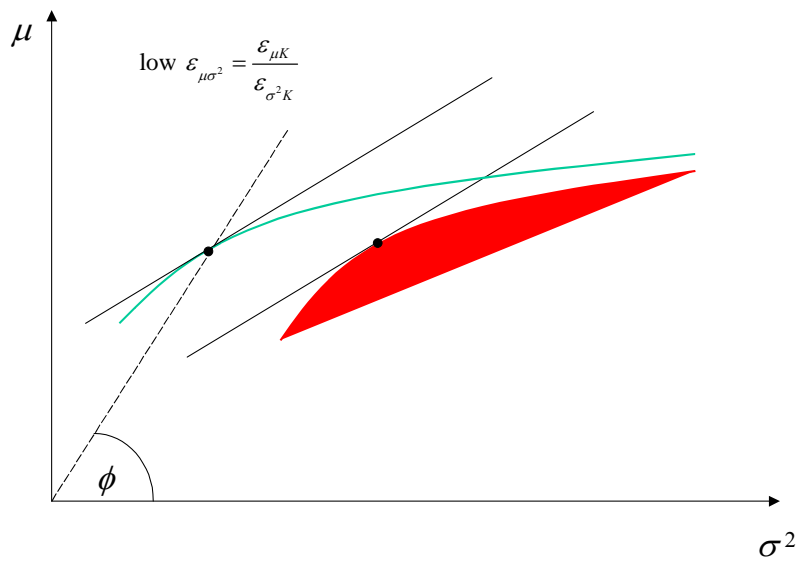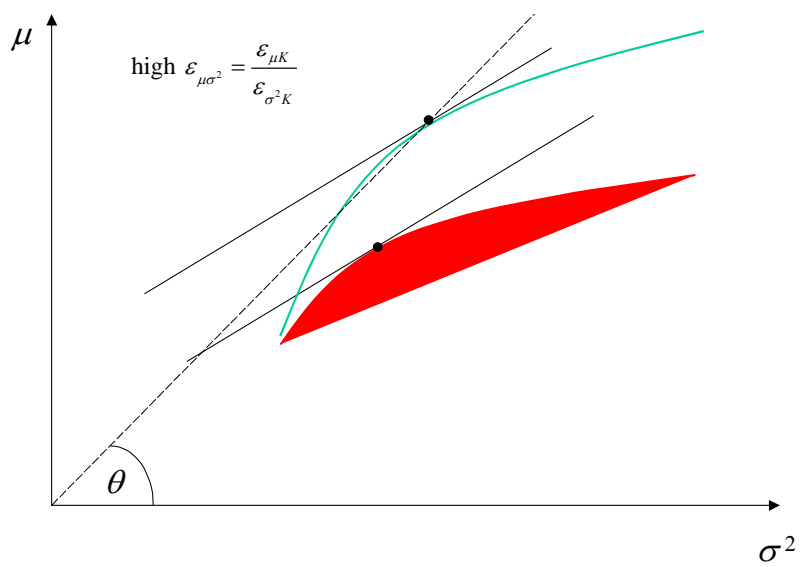**FIGURE 2: RELATIVE VARIANCE DISPLACEMENT IN THE UNIVERSE OF RISK**

low $\varepsilon_{\mu\sigma^2} = \dfrac{\varepsilon_{\mu K}}{\varepsilon_{\sigma^2 K}}$

μ

ϕ

σ^2

FIGURE 3: RELATIVE MEAN DISPLACEMENT IN THE UNIVERSE OF RISK

high $\varepsilon_{\mu\sigma^2} = \dfrac{\varepsilon_{\mu K}}{\varepsilon_{\sigma^2 K}}$

μ

θ

σ^2

The key determinant of $\varepsilon_{\mu\sigma^2}$ with which we are here concerned is the covariance amongst assets held in market portfolios. In particular, we observe that the greater is the change in covariance, *ceteris paribus*, the lower is $\varepsilon_{\mu\sigma^2}$. To see this, it is sufficient to note that $\varepsilon_{\mu\sigma^2} =$

$$\frac{\dfrac{\mathbf{1}^T\boldsymbol{\mu}_j - \mathbf{1}^T\boldsymbol{\mu}_i}{\mathbf{1}^T\boldsymbol{\mu}_i}}{\dfrac{\mathbf{1}^T\Sigma_j\mathbf{1} - \mathbf{1}^T\Sigma_i\mathbf{1}}{\mathbf{1}^T\Sigma_i\mathbf{1}}}$$

where $\boldsymbol{\mu}_i$, $\boldsymbol{\mu}_j$ = the vector of returns when $K = K_1$, K_2 respectively; Σ_i, Σ_j = the matrix of variances when $K = K_1$, K_2 respectively; and $\mathbf{1}$ = the unit vector. Evidently, the smaller is the change in the covariance matrix, *ceteris paribus*, the greater is the given ratio.

Our initial hypothesis can then be stated as follows. As capital markets increase in size the variance-to-market cap ratio falls (i.e. $\varepsilon_{\sigma^2 K} < 1$). There are four reasons why this might be so:

1) *the industry effect*: or, more fully, the *inter*-industry effect, whereby negative co-variances between *different* industries rise as the economy and the market cap become larger (Silicon Valley booms as Detroit rusts);

2) *the competition effect*: or the *intra*-industry effect, whereby industry variances decline as competition becomes more intense with larger market size (as competition increases, the ability to generate discretely different profits declines);

3) *the derivative asset effect*: derivative assets, which allow firms to preserve mean returns whilst reducing variances, are more widely available in larger than in smaller capital markets;

4) *the asset pricing effect*: asset prices of the same classes of assets are more stable the deeper is the capital market, hence markets with a larger cap have a lower volatility of asset prices and, so, lower variances of returns.

This is to say, in brief, that, as market cap rises, a combination of financial market deepening and changing industrial structure tends to lower market variances of returns.[4]

We further hypothesise that, as capital markets increase in size, the mean return-to-market cap ratio falls (i.e. $\varepsilon_{\mu K} \leq 1$). The reason for this is owed to a combination of three factors, namely.:

1) the fact that all markets inhabit the same (conditional) universe of risk;

2) the capacity of each market to fund the minimum efficient scale of operations for each industry within that universe;

3) non-increasing returns to capital in any given industry.

Our main prediction is then as follows: as capital markets increase in size, they experience a tendency for variances and mean returns to decline relative to the size of the market; which is to say, we expect them to experience a relative variance displacement. As variances tend to decline, the willingness of the economy to support higher risk investments increases, and, as mean returns tend to decline, the corresponding incentive to find and fund such higher risk investments rises. This increasing tolerance of risk is reinforced by the fact that larger capital markets are able to absorb greater risk in aggregate for the kinds of reasons given in the Lintner/Arrow-Lind argument: for reasons of risk spreading. (This latter phenomenon is captured in our simple model by lower values of *b* for larger capital markets.) Hence, as market capitalisation increases, we expect to see markets subscribe riskier projects than are subscribed by markets of smaller size; and, despite this being the

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[4]Bekaert & Harvey, 1997, p.58, in their discussion of emerging market volatility, also give four reasons for differential market volatility. Two of the factors mentioned by them – "asset concentration" and "political risk" – are effectively ruled out by our concentrating upon developed, rather than emerging markets. Specifically, they are ruled out by the assumption that firms inhabit the same conditional universe of risk. The two other factors mentioned – "stock market/economic integration" and "microstructure effects" – correspond to points (1)-(2) and (3)-(4) above.

case, the larger market may still have a lower mean return in aggregate than the smaller market.

4   Empirics

The empirical analysis proceeds in two steps. First we study the proposition as to whether smaller markets subscribe to less risk because investors in small markets are more risk averse. We do so by testing whether risk per capita actually declines as market size increases, as per the Lintner and Arrow-Lind theorems, using the statistical model:

$$\sigma_{it}^2 = \alpha + \beta(market\_capitalisation)_{it} + controls_{it} + \varepsilon_{it} \qquad (4)$$

where σ_{it}^2 indicates risk per capita in country i at time t and ε is an error term. If large stock markets have greater risk tolerance, we expect the sign of β to be negative.

Second, if risk per capita declines as market size increases, we study whether returns increase with market size. If large markets were more able to absorb risks than small markets, we would expect to see higher returns in large markets, all other things being equal. We test this hypothesis by estimating the statistical model:

$$return_{it} = \delta + \gamma(market\_capitalisation)_{it} + controls_{it} + \eta_{it} \qquad (5)$$

where δ is a constant, and η is an error term. A positive and statistically significant γ implies that large markets sustain more risks because they exhibit lower risk per capita and experience relatively neutral or mean displacing changes. In contrast, if the parameter γ is statistically insignificant or negative, we conclude that large markets experience relatively variance displacing changes, where these changes can be explained in terms of the four points given in the previous section (i.e. the industry effect, the competition effect, the derivative asset effect, and the asset pricing effect).

Equations (4) and (5) are estimated on an unbalanced panel of 35 developed and developing countries over the period 1934-2005. The panel contains quarterly data sourced from two databases. Historical series on the values of stock market indexes (open, close, high and low for the quarter) and capitalisation are extracted from

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Global Financial Data (www.globalfinancialdata.htm). For each quarter and country, risk is calculated as the difference between high and low of the stock market index divided by the index value at the beginning of the quarter (open), as:

$$risk = \frac{High - Low}{Open}.$$

This measure is used in place of the stock market's variance, or standard deviation, for the quarter, whose calculation requires daily data which we could not extract. Market capitalisation is reported in US$.

Data on population and the control variables are extracted from the International Financial Statistics database of the International Monetary Fund (www.imf.gov). Controls include capital markets variables (average return, discount rate, exchange rate of the national currency vis-à-vis the US$) and macroeconomic variables (consumer price index, unemployment rate, current account balance). The summary statistics of each variable are presented in Table 1.

TABLE 1   SUMMARY STATISTICS OF VARIABLES USED

Variable	Observations	Mean	STD	10th Dec.	90th Dec.
Dependent/Independent					
Risk per capita	2,629	.0205	.068	.0009	.0388
Market capitalisation in US$ (ln)	2,629	11.11	2.04	8.67	13.58
Control – Financial					
Return	2,594	0394	.225	-.158	.227
Discount rate	1,804	.106	.207	.0275	.185
Exchange rate	2,243	32.38	293	.00003	1
Control – Macroeconomics					
Inflation	2,265	.0351	.138	0	.0818
Unemployment rate	1,270	.0759	.042	.0307	.1267

Source: Global Financial Data, IMF International Financial Statistics – various years

One complication in the estimation of equation (4) is that the historical series on market capitalisation contains a unit root while data on risk per capita do not. Normally this problem is avoided by estimating equation (4) in differences rather than in levels. However, it is precisely the level of market capitalisation that we want to relate to risk per capita. As a result, we proceed by undertaking three alternative approaches. First we estimate equation (4) on variables averaged across time for each country.

In particular, the model formalised by (4) reduces to:

$$\sigma_i^2 = \alpha + \beta(market\_capitalisation)_i + controls_i + \varepsilon_i \qquad (6)$$

Second, we estimate equation (4) on the cross-section of all observations 'stacked-up' across time and countries, so that each data point is treated as being unique and independent of others even if technically belonging to the same country.

Third, we estimate equation (4) using panel data techniques after adjusting market capitalisation by the CPI index of the corresponding period.

3   Results

Table 2 reports the regression results. The top half of the Table presents the estimates of the parameters of interest whilst the bottom half shows the result of post-estimation statistical tests. These include the overall significance of the regression coefficients (F-statistic), and model specification. The signs ** and * highlight estimates that are statistically significantly different from zero as well as rejected outcomes of statistical tests at the 5% and 10% level, respectively. As shown in Table 2, all estimates are obtained from statistically significant regressions. The estimates reported are obtained from robust estimation to control for cross-country heteroskedasticity.

TABLE 2   REGRESSION RESULTS

Coefficient	OLS (averages)	OLS (stacked)	Random Effects
β	-.007**	-.004**	-.00004**
	(.0006)	(.0004)	(.00001)
Constant	.0988**	.0757**	.026**
	(.007)	(.005)	(.0066)
Nr Observations	34	850	850
Control variables			
Financial	No	Yes	Yes
Macroeconomic	No	Yes	Yes
Tests			
Adjusted R^2	p = .0355	p = .01335	p = .005
Reset	p = 0	p = .9973	
Heteroskedasticity	Yes (robust)	Yes (robust)	Yes (robust)
Overall significance (p-values)	p = 0	p = 0	p = 0
Hausman Chi^2			4.29

Source: Global Financial Database and International Financial Statistics – various years

The results reported in Table 2 indicate that the sign of the parameter β is negative and statistically significant. In the light of the Lintner and Arrow-Lind theorems, this deflates the *prima facie* claim that small markets underwrite fewer risks because they are composed of more risk averse agents. It also tends to confirm that claim that large markets can sustain a higher level of risk because the investors who compose it face a lower risk per capita.

Having established this, we can now turn to the question whether large markets also display higher returns, in line with their higher tolerance for risks. *Prima facie*, this hypothesis is not supported, as illustrated in Figure 4, which depicts the average returns and market capitalisation of 35 stock markets during the period 1988-2005.

FIGURE 4: AVERAGE RETURN AND MARKET CAPITALISATION: 1988-2005
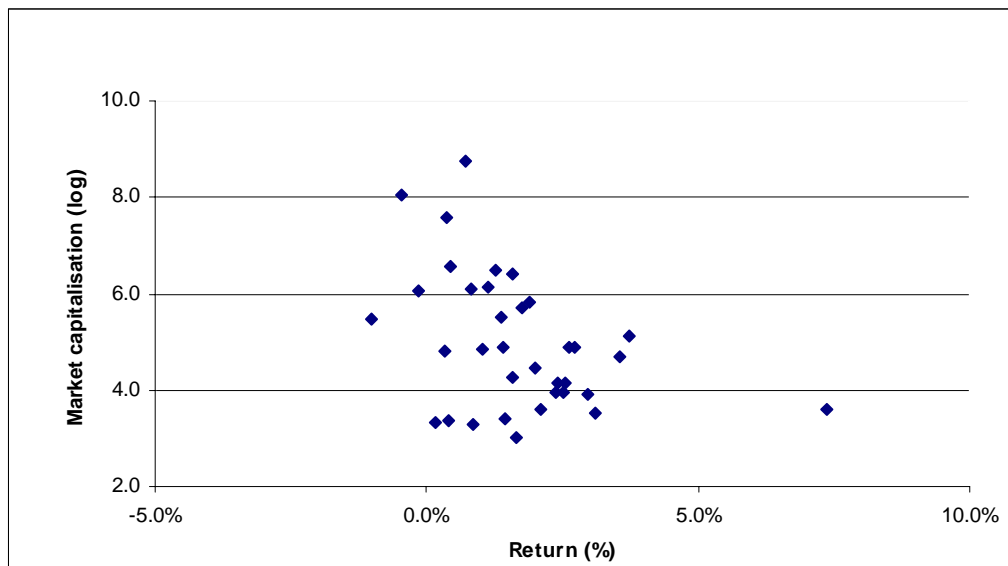
As illustrated by Figure 4, the relationship between return and market capitalisation appears to be negative. The statistical model formalised by equation (5) tests the direction and strength of this relationship. As done in the case of equation (4), the problem of unit root in the historical data on market capitalisation is dealt with by adopting alternative estimation approaches. As a result, we estimate equation (5) by performing an OLS regression on data averaged across time, and on data 'stacked', and by performing a fixed effects regression after adjusting the market capitalisation

by the CPI index of the corresponding period and country. The results are displayed in Table 3.

TABLE 3   REGRESSION RESULTS

Coefficient	OLS (averages)	OLS (stacked)	Random Effects
γ	-.0052**	.0053	-.00066**
	(.00031)	(.0049)	(.00017)
Constant	.0969**	-.148*	.086
	(.0037)	(.089)	(.090)
Nr Observations	34	850	850
Control variables			
Financial	No	Yes	Yes
Macroeconomic	No	Yes	Yes
Tests			
Adjusted R^2	p = .0665	p = .0438	p = .0145
Reset	p = 0	p = .7507	
Heteroskedasticity	Yes (robust)	Yes (robust)	Yes (robust)
Overall significance (p-values)	p = 0	p = 0	p = 0
Hausman Chi^2			11.33

Source: Global Financial Database and International Financial Statistics – various years

The results suggest that return and market size are negatively related. This and the earlier result indicate that capital markets tend to experience relative variance displacing changes as they increase in size. This, in turn, suggests that the extent of low and negative correlation amongst assets tends to increase as the universe of risk inhabited by capital markets widens. A corollary of this is that investors in large markets are better able to spread risks both because of the size of the market and because of the proportionately greater negative and low correlation of risks that characterises a large economy. And it is precisely these features that make the economy more able to bear risk. Accordingly, we are not surprised that larger economies subscribe relatively greater quantities of risky firms than do smaller markets. This feature is, moreover, consistent with investors in large and small markets having the same risk attitudes and with the outcome that large capital markets have lower variance per capita and lower mean returns than smaller markets.

4   Final remarks [incomplete]

Implications for locating and financing risky activities such as R&D, and new ventures.

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