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THE DIVIDE BETWEEN DEVELOPED AND EMERGING CAPITAL MARKETS IN A GLOBALISED WORLD: CAN WE DISCRIMINATE?

No. 19, October 2008

Acknowledgment: Ariff wishes to record his thanks to the University College Dublin, Ireland, for financial support enabling him to be associated with this research conducted at the School of Business during 2004-2006. This paper has been presented at two staff seminars in Australian universities, and comments of participants are addressed in this version of the paper. Remaining errors are the responsibility of all authors.

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With globalisation financial development has spawned across the world creating a two-tiered funds market, developed and emerging. This paper is about discriminating the characteristics, and identifying the variables that would help an analyst to distinguish a capital market to be termed a developed or an emerging market. The financial economics literature has a vast body of reports where the terms developed and emerging are used widely. The basis of the application of the two descriptors has not been examined vigorously using some quantitative method(s) to verify if the terms used conform to verifiable characteristics. The aim of this paper is to do exactly that in the hope of identifying the variables that are associated with the developed and emerging states of a given capital market as discriminating groups.

To achieve this goal, the analysis applied is the discriminant analysis. Data were collected for a sample of markets identifying a number of characteristics of the markets as well as suggested factors that may be associated with either status of the market. The statistics from such an analysis have revealed clear indication of a number of characteristics and factors as being important for classifying a given market to be either developed or emerging. These findings, we believe, help to provide authenticity to the terms – developed and emerging – widely used by identifying the empirical basis for these terms.

JEL Classification: E44, G18, N20
Key words: developed, emerging, capital markets, characteristics, discriminant analysis, stages of development

1. Introduction to literature and research issue

The global search for and spread of capital has spawned a globalised world for capital. Its beneficial effects have been many, and are reported in the literature: we know that it takes 2/3 capital input and 1/3 labour input to produce a dollar of GDP, hence the importance of capital. But this paper is about the creation of a two-tiered capital market place, a developed and emerging. How does one distinguish one from the other is the subject of this paper and it may help to shed some light on the ongoing debate of global impact of spread of capital markets. Although the terms are widely used, there is no commonly agreed definition of what are the recognisable features of a developed, as opposed to developing or emerging stock market. The purpose of this paper is to contribute to this discussion, through identifying a number of measures that can be used to distinguish between markets in each of these categories. A secondary contribution of this form of analysis is that it may assist regulators who seek to identify which attributes are of most importance, when they put in place the structures to allow a market to develop successfully. It is widely recognised that a developed capital market will contribute to economic growth because prices forming in developed markets are said to be more information efficient. Also, in sciences, it is common to subject reliability of *categories* by verifying the characteristic of categories using some quantitative analysis.

There is widespread agreement regarding the contribution that a large developed stock market will make to a national economy: King and Levine (1998). It is the abundance of capital outlay (as well as its efficient allocation via market-based signals) that differentiates a high-growth economy from one that has low growth. For example, The United Nations Millennium Declaration has highlighted the task of mobilising the financial resources needed to achieve the International Development Goals and, more generally, to finance the development process of developing countries (The International Conference on Financing for Development, March 2002). There is considerable evidence that developing countries that have established a stock market are growing at a considerably faster rate than their comparators that have yet to do so. This is also consistent with the following observation: a basic economic statistics in income calculation suggest that a unit of capital adds twice as much as a unit of labour to the creation of gross domestic products of most countries. The available evidence confirms this. In Table 1, we present randomly selected data from countries classified by The World Bank as either high-income, upper-middle-income, lower-middle-income, or low-income. Average capitalisation to the GDP of high-income economies is

0.883, and the average of upper–income economies is 0.513, and the average of lower-middle-income economies is 0.273, and the low-income economies scored just a tiny 0.08, highlighting the scarcity of capital, the original cause being paucity of capital and also lack of financial markets to harvest savings, to generate income growth. Although this does not indicate a causal relationship, there is at least a directional association.

(Insert Table 1 here)

In this study, we take a quantitative approach to the issue of stock market development by examining a large sample of markets over a relatively long period, to analyse the link between the development of stock markets and the components of market structure. In order to do this, we begin by identifying reasonable measures of stock market development. Previous literature indicates that stock market development is a multi-dimensional concept. The measures that are normally considered include stock market size, liquidity, volatility, concentration, integration with world capital markets, and the legal rules (regulation and supervision) governing a market. For example Jovanovic (1993) tests the hypothesis that the stock markets have a positive impact on growth performance. He finds significant correlations between economic growth and the value of stock market trading divided by GDP which is used as measure of stock market development. Levine (1997) uses indicators of stock market development such as stock market size, liquidity, and volatility. Eelke de Jong and Radislav Semenov (2002) use capitalisation divided by GDP as the measure of stock market development.

Thus there clearly are different measures of stock market development. Demirguc-Kunt and Levine (1996) show that different individual measures and indexes of stock market development are highly correlated. They claim that greater volatility (in the stock market) is not necessarily a sign of more or less stock market development. Indeed, high volatility could be an indicator of development. Levine and Zervos (1998) find that stock market liquidity is positively and significantly correlated with current and future rates of economic growth, and they consider that market liquidity to be a measure of market development. Garcia,Valeriano and Lin (1999) use market capitalisation as their measure for stock market development. They believe it is a good proxy for such general development because it is less arbitrary than other individual measures and indexes of stock market development. Levien (2000) uses the market capitalization ratio to measure the size of stock market, but he argues that there are conceptual problems with using market size to gauge market development.

None of these studies however answer the question as to why one should use one indicator rather than another, to measure the development process of stock markets, and what factors have contributed *collectively* to the development process. Existing literature only provide three major factors that assist in indicating the stage of development of a capital market. We contribute to this debate by addressing the research question as to which indicator(s) are more associated with the development process, and can be used to classify a market in terms of its stage of development. To do this, we employ a series of empirical tests, to identify which variables are best able to distinguish between markets at different stages of development.

At initial glance, this debate may seem a straightforward, as per capita Gross Domestic Product is widely used as a measure of development. Per capita GDP is used to classify, for example, developing countries into low income, middle income and high-income categories. As it is a measure of the size of an economy, relative size may be taken as an indicator of the stage of development. However, this is a crude measure. If, for example, oil was discovered suddenly, and a country becomes rich by exploiting it, then GDP may indicate that country as highly developed. However, it would be fallacious to assume that such a country possesses a developed stock market. We therefore select available measures that are connected to stock market development. These measures represent market depth, market liquidity, and market activity. We then test how successfully these variables discriminate between markets that may be designated either as developing or developed. This designation is done using GDP; countries above an average measure are taken as developed, and vice versa.

The rest of the paper is organised as follows. In section two, we identify our study variables, and we justify their inclusion. Section three presents summary statistical information, and analysis, of these variables. In the following section, we present results of a test of mean differences of these variables, between developed and developing markets. Section five offers the results of a discriminant analysis of our study variables, and a final section concludes with a discussion of our results.

2. Data and variables

A good deal of data is available at the websites of the Federation of World Exchanges, International Organization of Securities Commissions and other regional federations, or in the websites of exchanges themselves. Data on a population of slightly less than 100 stock markets is available from these sources, and from these, we chose our sample of 41 markets. This sample ranges across different stages of development. In any case where there is more than one national stock market, the largest market is taken as representative of that country. For every national market, we also take annual GDP values in local currency, from International Financial Statistics. We then convert all currency values to a single currency, the U.S. dollar, at the appropriate exchange rate, to facilitate comparisons between the markets.

Using GDP values at the beginning of the study period, the 41 national markets are ranked, and those above the mean value are designated as developed, and placed in group D = developed (13 of them). Those below this value are designated as developing or emerging, and in group E (28 of them). As the E group contains a much larger number of national markets, it is further sub-divided into two groups of approximately the same number of markets (E1 (13) and E2 (15)), again depending on relative GDP. The national markets included in each group are as follows: Group D – U.S., Canada, Netherlands, Finland, South Africa, U.K., Luxembourg, Sweden, Switzerland, Australian, Hong Kong, Malaysia, Singapore; Group E1 - Chile, Greece, Denmark, Germany, Ireland, Norway, Spain, Israel, Japan, Korea, New Zealand, Philippines, Thailand; Group E2 - Argentina, Peru, Mexico, Brazil, Hungary, Turkey, Slovenia, Malta, Iran, Poland, Austria, Sri Lanka, Indonesia, India, China.

Annual data, over a study period of eight years is used, covering the period from 1995 to 2003. Clearly a longer period is desirable; however this is the longest period, in the sources as at 2007, over which a reasonable number of measures are available across a sizable range of national markets. All variables have been constructed from the following available market measures: Capitalisation, Number of listed companies, Total value of shares traded, Value of investment funds, Average value of transactions, Turnover velocity, Capital raised in the market, Number of shares traded, and Number of transactions.

Construction of the study variables is summarised in Table 2. When necessary, to allow for relative scale, a variable is adjusted by the appropriate annual national GDP.

Variables 1, 2, 3 and 4 offer measures of market depth. For variable 1, capitalisation represents total market value, and it equals the total number of shares of domestic companies multiplied by their respective prices. When divided by GDP, it offers a measure of the relative depth of the market. In variable 2, the number of shares traded includes trading in all shares, domestic and foreign. Trading by investment funds is included. This is divided by the number of listed companies, to provide a measure of corporate depth. Variable 3 is an indicator of market size, as it is the number of shares listed on the specific exchange. Variable 4 is the total value of investment funds, and it again is scaled by GDP, to offer a measure of relative investment capacity.

(Insert Table 2 about here)

Variables 5, 6, and 7 provide measures of market liquidity. Variable 5 represents the total value of shares traded, as it equals total number of shares traded, multiplied by their respective prices. When divided by the number of companies, it gives an annual transaction value per company. For variable 6, the number of transactions is divided by the number of companies, to give a measure of the number of transactions per company. Variable 7 represents transaction liquidity, as it equals the total value of shares traded, divided by the number of transactions, to generate an average value of transaction.

Variables 8, 9, and 10 indicate market activity. For variable 8, the total amount of capital raised through a new issue of shares is divided by the number of companies, to give a measure of corporate funding. Variable 9 offers a further measure of funding capacity, by dividing the annual amount of capital by national GDP. Variable 10 equals the total annual turnover of shares, divided by their market capitalisation.

3. Descriptive statistics

Summary statistical information on three of the four measures of market depth is presented in Table 3. The information is summarised for each group of national markets, and it offers an initial indication on how successfully each measure may discriminate between markets in each designated group. All measures are taken across the full study period. Variable 1 is slightly skewed, with positive kurtosis, however mean values for the D group are greater than that for the E groups. It does appear to be related to relative levels of development. Relative mean values for E1 and E2 are as expected, however the difference between them is considerably smaller. Variable 2 is a measure of corporate depth, the distribution of which again is slightly skewed, with positive kurtosis.

Average values however are very different, particularly if a comparison is made between the E1 and the E2 groups. An examination of figures for individual markets indicates that the mean value for E2 is dominated by a few outliers. For example the number of shares traded per listed company in Turkey is 52,443.83, whereas in many cases, the typical value is less than 100. Institutional differences may be relevant, as the typical value of 1000 shares in one market may differ considerably from their values in other markets. Although this variable may therefore not successfully discriminate between developed and under-developed markets, the value does fall as level of development increases. Variable 3 is market size, and the average number of companies listed during the study period, for D, E1, and E2, are 935, 766, and 283 respectively. The trend is as expected. The fourth variable is public investment capacity. Mean and median values are close, and kurtosis is positive. Also, as expected, the value of investment funds represents a larger percentage of GDP in markets that are more developed.

(insert Table 3 here)

Summary values of the three variables indicating market liquidity are also presented in Table 3. Variable 5 is transaction value. Measures of standard deviation suggest a wide distribution, as is also evidenced by the considerable gap between mean and median values, which is most obvious in the D group. This may be due to outlying values. As expected, average transaction values are related to the level of development. Variable 6 is similar, as it is a measure of the number of transactions per company. Values clearly are more widely distributed in the less developed markets, as is evidenced by the standard deviations, and the increasing gap between mean and median values. Variable 7 offers a direct measure of liquidity, as it indicates average value per trade. As mean and median values are reasonably close, the distribution is close to normal, but with positive skewness and kurtosis. As expected, levels of liquidity are clearly related to levels of development.

A final set of measures indicate the level of market activity. Summary statistical information is presented in last rows of Table 3. Variable 8, the level of corporate funding, appears to be relatively close to a normal distribution, as mean and median values are close to each other. Skewness is low, and there is positive kurtosis. As expected, values for the developing groups are lower, however average E2 values are greater than average values for E1. Variable 9 indicates funding capacity of the national market, relative to the overall size of the economy. As expected, there is greater capacity in the more developed markets. Statistical measures indicate that this variable behaves in a similar manner to most others; however there is evidence of excess skewness

and kurtosis in the E2 group. The final variable, turnover velocity, again is close to a normal distribution. However, if may not discriminate successfully between the three groups, as average values and standard deviations for E1 are greater than the other two groups.

To further investigate normality of the distribution of each variable, we present results of the Komolgrov-Smirnov D-test. A null hypothesis is that the variable is not normally distributed. Summary test results for each variable are presented in Table 4. Test results indicate that, in all cases, a null hypothesis is rejected, and therefore that all variables are normally distributed despite a casual look at the skewness suggests.

(Insert Table 4 here)

4. Tests of mean differences

In most cases, an examination of these variables indicates that they do appear to distinguish successfully between developing (we are using a broader term for emerging) and developed stock markets. Most variables also appear to successfully distinguish between the degrees of development represented by the two subsidiary groups, E1 and E2. However, it is not possible to definitively interpret the results in this way, as many of these variables clearly are related to each other, so that they could effectively be substitutes for each other. Further, looking at each variable at a time does not take into account the joint effects of all variables. The net contribution of each variable is open to question. Also, the direction of relationship between each variable and market development is not constant, as some increase when indicating greater development, whereas decrease. Considering the construction of these variables, this is to be expected. To examine this issue in greater depth, we provide tests of the mean differences between each variable, in each group. A 't' test provides evidence of significant differences in the mean values. A non-parametric Mann-Whitney 'U' test statistic also is presented, as this test requires no assumption regarding the distribution of the variables. Also, because of differences in the number of markets allocated to each group, there are differences in the number of observations of any variable in each group. Clearly, the inclusion of a non-parametric test is desirable. For both tests, a null hypothesis is that the mean values do not differ between groups. We also present the 'Z' statistics.

We present tests on the differences between the D group of markets, and the E1 group, i.e. E1 plus E2. We also examine differences between the E1 group and the E2 group (as developing). A further test is for differences between the D group and the E group, which represents a combination

of the markets allocated to groups E1 and E2. A null hypothesis is that there is no significant difference between an individual variable coming from the two groups. Rejection of the hypothesis would indicate that there is a significant difference. Test statistics are presented in Table 5. Significance is tested at the 5% level. A significant result indicates rejection of the hypothesis, confirming a difference between the values of variables from each group.

(Insert Table 5 here)

Variables 1, 2, 3 and 4 offer measures of *market depth*. A test of differences between group D and group E1 indicates significant differences in three variables. The only exception is variable 2, the measure of corporate depth. As noted in earlier discussions, this variable indicates the number of shares traded per company, and may be affected by institutional differences that are not related to the level of development. An examination of differences between the E1 and E2 groups provides a similar result. In the case of variable 2, a significant 't' test is not confirmed by the 'U' test statistic. An examination of differences between the D (developed) group and the combined E (developing) group further confirms significant differences between the values of variables 1, 3, and 4.

A measure of *market liquidity* is provided by variables 5, 6, and 7. An examination of these test statistics indicates that in the case of variables 5 and 7, there are clear differences between all groups. These two variables clearly distinguish between groups D and E1, between groups E1 and E2, and also between groups D and the combined group, E. In all cases, there are significant differences between the values of variables 5 and 7. All results also indicate that variable 6, the number of transactions per listed company, does not discriminate between the various groups of markets. The 'U' test statistic indicates significant differences between group D, and group E, the combined group of those stock markets designated as developing markets. However, as this difference is not confirmed by the 't' test result, it is unlikely that variable 6 fully discriminates between even these groups.

The final three variables offer measures of *market activity*. Test statistics on the differences between the mean values of these variables indicate that variable 9 clearly discriminates between all of groups of markets. However, variable 10, a measure of turnover velocity, does not discriminate between group D, the group containing the most developed markets, and either E1 or the combination of E1 and E2, representing all markets designated as developing markets. Variable 8, a measure of the amount of capital raised per company, does differ between the developed group

and the combined group of developing companies; however average values in each of the developing groups (E1 and E2) are not significantly different. That is, developed and developed markets are different in capacity to raise funds.

In summary, tests of mean differences do support the general proposition that national stock markets categorised into three separate groups do exhibit significantly different measures of market depth, market liquidity, and market activity. Most variables offering a measure of one of these attributes do distinguish successfully between the three groups, the developed vs the early-emerging vs newly-emerging. Relative levels of GDP were used to allocate markets to one of these groups, under the assumption that it provides a good though imperfect indication of level of development of the national equity market, so a reasonable conclusion is that these measures provide a further indication of level of market development. The common nomenclature emerging as one group based on GDP size in the current finance literature is invalid as the emerging markets actually consist of *two distinct sub-groups* (there are close to 70 such markets in the world). However, as many of these measures are related to each other, there will be high degrees of correlation between them. They therefore will differ in the extent to which they contribute towards the classification of markets in terms of their degree of development.

5. Discriminant Analysis

We conclude this analysis with a discriminant function analysis, to determine which of the variables best discriminate between the groups of developed and developing stock markets. We therefore apply a linear equation of the form:

$$\text{Group} = a\,x_1 + b\,x_2 + c\,x_3 + ... + d\,x_n \qquad (1)$$

where X_1, X_2, etc. represent the study variables, and a, b, etc are the relevant coefficients. In order to determine the contribution that each variable makes towards discriminating between the groups of markets, we present the following output values: Wilk's lambda; the Canonical correlation; Eigen value, and Chi-square value.

Considering the results of tests of mean differences, presented in an earlier section, between the groups of developed and developing markets, we restrict this analysis to an examination of differences between the D and E groups of markets. We make this restriction because earlier tests

of mean differences indicate a relatively weak difference between the two subsidiary groups of developing markets, E1 and E2. We therefore combine these groups to form a larger group of markets, designated as developing (emerging), and we test the power of the study variable to discriminate between the developed and the developing groups of markets. We categorise our dependent variable (Group) as equal to one for national markets in the developed group, and equal to zero for all markets assigned to the developing group.

Initial discriminant test allows us to examine the ability of each study variable to distinguish between the two groups of markets. Statistical test values are presented in Table 6. If the four study variables representing market depth are considered, variable 1, the ratio of market capitalisation to GDP, clearly has greatest discriminatory power. This is not unexpected, as the markets were initially assigned to either the developed or the developing group on the basis of relative GDP. Those markets located in nations with a GDP above mean value of national GDP for the entire group of 41, have been assigned to the developed group, and vice versa. Of the remaining variables, the number of listed companies (No. 3) also has strong discriminatory power. Values of Wilk's Lambda, and of Canonical correlation, together with a highly significant chi-square value, confirm this. Of the remaining variables representing market depth, the measure of public investment capacity also discriminates, but variable 2 does not.

(Insert Table 6 here)

When the measures of market liquidity are considered, two are identified as discriminators. Variables 5 (value of shares traded per company) and 7 (average value of transaction) are clearly significant. A relatively lower value of Wilk's Lambda confirms that variable 5 is the more powerful discriminator. An insignificant chi-square indicates that variable 6, the number of transactions per company, does not discriminate successfully. The final three study variables offer a measure of market activity. Chi square values show that variables 8 and 9 do have discriminatory power. Very low lambda values, together with highly insignificant test values thus indicating that variable 10, the measure of turnover velocity, has no power. We conclude this initial analysis with a combined discriminant test.

This is done by entering the ten variables for one run in the test. All test values indicate that this combination possesses the greatest power. Both lambda and chi-square test values confirm this. This result indicates that all study variables contribute towards the identification of a market either

as developed or developing, even though an individual analysis indicates that three variables are not significant.

Results of the individual discriminatory tests can also be used to assess the relative power of each study variable. We rank each individual measure by the Wilk's Lambda, starting with the lowest value, which indicates greatest power. The ranking produced by this measure is very similar to that produced by relative chi-square values, where the highest value indicates greatest significance. For reasons of comparison, we show this ranking. We also compare these rankings with the ranking produced from the 'U' test of differences in means of study variables between the developed group D and group E (note columns six and seven of Table 7). Table 7 lists the study variables, ranked using Wilk's lambda. To facilitate a comparison with the other measures, we also indicate the rankings produced by relative chi square values, and by relative 'U' test values.

(Insert Table 7 here)

It is interesting to note the similarity of rankings of explanatory variables, produced by these three measures. This strong finding offers a clear indication of the relative importance of these variables, when classifying markets either as developed or developing. It is unsurprising that variable 1 dominates all three lists. As a measure of relative market depth, it is computed as market capitalisation divided by national GDP. As relative GDP is the original measure used to designate markets as members of either Group D or Group E, its relative importance is expected. It is of considerable interest to note the prominence of variables 3 and 5, and to a lesser extent variable 7. National GDP is not an input measure to any of these variables, yet they remain important in distinguishing between developing and developed markets. They indicate the importance of including measures of market depth and market liquidity, when determining degree of development. Variables 2, 6, and 10 clearly are the least useful, as they receive low rankings from all three measures. Both the difference of means tests, and the discriminant analysis question the value of including these measures, however it is of interest to note that all of them do appear to contribute to the combined discriminant test.

6. Summary and Conclusions

In this paper, we identify a series of measures or explanatory variables, which we propose will be of value to regulators, as well as to the financial economists, as they seek to identify the *key* features associated with a developed stock market for special effort for promoting market

development, in the process of an emerging market progressing to developed status. These explanatory measures will facilitate the identification of those features - to correctly adopt the nomenclature to be used is yet verified - most typically associated with stock markets that have developed successfully. Considering how a well functioning market can contribute a very significant proportion of the development capital that a growing economy requires, there is widespread agreement regarding the potential value of successful stock market. National regulators clearly will therefore wish to identify those specific factors associated with a developed market, and to ensure the establishment of an environment in which they will be encouraged to progress. For scholars who use the terms developed and emerging, this paper offers a test of the relevance of this categorization, hitherto not attempted.

We specify three main attributes of a market, and we identify the explanatory variables that will best represent these attributes. From the relevant literature, it is clear that market depth, market liquidity, and market activity will be important elements of a developed market; not just the GDP per capita as used presently. Using these general categories, we identify a series ten study variables, which we believe will successfully distinguish between developing and developed markets. An important feature of each of these variables is that they can be constructed annually, using generally available market information. As measures of market performance, covering a wide range of national stock markets, are only available relatively recently and are also as at 2006, we limit our measures to 41 markets, over an eight year period from 1995 to 2003.

We present descriptive statistics on each of these explanatory variables. We also present a series of statistical tests on the ability of each variable to distinguish successfully between developed and developing national stock markets. A number of tests of mean differences are followed by a discriminant analysis of each variable, and a combined discriminant analysis of all explanatory variables. Results of all tests are surprisingly similar, and allow us to identify those measures or variables that tend to be most different between developed and developing markets. In terms of relative importance, we identify that variable 1, the measure of relative *market depth*, as the most important. It is of considerable interest to note the prominence of *size* of the market, *transaction value*, and to a lesser extent transaction *liquidity*. The latter three measures are of particular interest, as none of them includes a measure of GDP. A measure of relative GDP had originally been used to designate a market either as developed or developing. Also, it is of interest to note that while the

first two elements of a developed market, market depth and market liquidity are important, the last element, market activity is of less importance when distinguishing between stock markets at their different stages of development

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Table 1: market capitalisation and economic growth as at start 2003

Countries	GDP	Capitalisation Of listed companies	Cap to GDP	Economic Growth %
Australia	409.0 billion	381.0 billion	0.93	2.7
Japan	4.0 trillion	2.1 trillion	0.53	0.3
UK	1.6 trillion	1.9 trillion	1.19	1.8
Malaysia	94.9 billion	124.0 billion	1.31	4.2
Poland	191.3 billion	28.7 billion	0.15	1.0
Lebanon	18.3 billion	1.4 billion	0.08	2.2
Egypt	89.9 billion	26.1 billion	0.29	3.2
China	1.3 trillion	463.0 billion	0.36	8.0
Indonesia	173.0 billion	30.0 billion	0.17	3.7
Nigeria	41.5 billion	5.7 billion	0.14	1.5
Zambia	3.7 billion	217.0 million	0.06	3.3
Tanzania	9.4 billion	398.0 million	0.04	6.3

Source: World Bank financial indicators 2002.

Table2: The Study Variables Defined

No	Market characteristics and variables	How Computed
	A: *Market depth*	
1	Relative depth of market	Capitalisation / GDP
2	Corporate depth	Number of share traded / number of companies listed
3	Size of the market	No of listed companies
4	Public investment capacity	Value of investment fund / GDP
	B: *Market liquidity*	
5	Transaction value	Value of share trade / No of companies
6	Transactions	No of transactions/No of companies
7	Transaction liquidity	Value of share traded/No of transactions
	C: *Market activities*	
8	Corporate funding	Capital raised / No of companies
9	Fund capacity	Capital raised / GDP
10	Turnover velocity	Turnover of share traded / capitalisation

Table 3: Descriptive values of study variables, 1995-2003

Variable	Group	Mean	Median	St Dv	Kurtosis	Skewness
1	D	1.473	1.276	0.606	3.280	1.715
	E1	0.536	0.486	0.143	1.492	1.122
	E2	0.213	0.211	0.083	4.165	0.123
2	D	212.398	79.052	480.933	12.239	3.463
	E1	365.324	57.972	1029.499	12.738	3.557
	E2	5091.188	12.069	14320.030	33.790	3.084
4	D	0.013	0.010	0.014	5.442	2.167
	E1	0.006	0.001	0.009	2.319	1.738
	E2	0.002	0.000	0.004	10.348	1.781
5	D	712.726	335.392	857.827	5.266	2.112
	E1	298.417	253.079	311.197	2.500	1.610
	E2	139.481	89.774	194.643	33.984	2.743
6	D	22.389	13.666	27.505	9.458	2.906
	E1	25.858	7.432	42.759	8.140	2.738
	E2	50.085	7.584	96.962	28.856	2.108
7	D	43.681	26.849	43.231	4.901	2.043
	E1	28.821	20.210	34.296	6.466	2.340
	E2	10.999	6.396	12.902	31.046	1.675
8	D	18.389	11.971	17.715	2.116	1.753
	E1	9.386	9.961	5.409	1.870	1.093
	E2	11.963	8.031	11.554	2.607	1.413
9	D	0.039	0.022	0.033	2.961	1.832
	E1	0.020	0.015	0.016	5.634	2.178
	E2	0.017	0.011	0.027	25.290	3.322
10	D	0.579	0.593	0.255	0.915	-0.650
	E1	0.733	0.583	0.552	1.168	1.307

	E2	0.522	0.411	0.452	0.760	1.385

Table 4: Test results of normality using Komolgorov-Smirnov D-test

	Komolgorov-Smirnov			Shapiro-Wilk		
Variable	Statistic	df	Significance.	Statistic	df	Significance
1	0.284	25	0.000	.538	25	0.000
2	0.479	25	0.000	.243	25	0.000
3	0.276	25	0.000	.646	25	0.000
4	0.348	25	0.000	.417	25	0.000
5	0.299	25	0.000	.590	25	0.000
6	0.343	25	0.000	.526	25	0.000
7	0.245	25	0.000	.678	25	0.000
8	0.285	25	0.000	.724	25	0.000
9	0.321	25	0.000	.598	25	0.000
10	0.199	25	0.012	.825	25	0.001

Table 5: Test results of difference in means between groups

	D and	E1		E1 and	E2		D and	E
Variable	t- value	u- value		t- value	u- value		t- value	u- value
1	7.733*	515.000*		13.586*	1403.000*		7.733*	560.000*
2	-1.304	5396.000		-2.426*	4928.000		-1.373	11015.000
3	4.592*	2561.000*		6.623*	4269.500*		4.592*	4493.000*
4	2.599*	1097.000*		2.151*	1259.000*		2.771*	2052.500*
5	4.129*	4412.000*		5.579*	4669.000*		4.110*	7734.000*
6	-0.745	4188.000		-0.240	3890.000		-0.543	7746.000*
7	5.024*	3368.500*		3.963*	2816.500*		4.806 *	5076.000*
8	3.280*	4104.000*		1.358	5923.000		3.280*	8469.000*
9	5.370*	3492.500*		2.746*	5013.500*		5.370*	6274.000*
10	-1.608	6161.500		3.077*	3730.500*		-1.674	9753.000*

* indicates significance at the .05 level.

Table 6: Findings from discriminant analysis of groups D and E

Variable	Eigen value	Canonical correlation	Wilk's Lambda	Chi-square
1	0.440	0.553	0.694	131.855* (0.000)
2	0.011	0.103	0.989	3.410 (0.065)
3	0.232	0.434	0.812	65.316* (0.000)
4	0.077	0.267	0.929	13.597* (0.000)
5	0.154	0.365	0.867	50.715* (0.000)
6	0.003	0.053	0.997	0.834 (0.361)
7	0.101	0.302	0.909	27.824* (0.000)
8	0.033	0.180	0.968	10.763 * (0.001)
9	0.099	0.300	0.910	32.907 * (0.000)
10	0.000	0.009	1.000	0.027 (0.871)
All	1.895	.809	0.345	137.118 * (0.000)

* indicates significance at the .05 level.

Table 7: Relative rank of study variables using various measures

Variable (No.)	Wilk's lambda	Chi square	'U' value
Relative depth of market (1)	1	1	1
Size of market (3)	2	2	3
Transaction value (5)	3	3	6
Transaction liquidity (7)	4	5	4
Fund Capacity (9)	5	4	5
Public investment capacity (4)	6	6	2
Corporate funding (8)	7	7	8
Corporate depth (2)	8	8	10
Transactions (6)	9	9	7
Turnover velocity (10)	10	10	9