

# ***Do Stock Markets Promote Economic Growth?***

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## DO STOCK MARKETS PROMOTE ECONOMIC GROWTH?\*

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*Abstract.* One of the most enduring debates in economics is whether financial development causes economic growth or whether it is a consequence of increased economic activity. Little research into this question, however has used a true causality framework. This paper fills this lacuna by using Granger-causality tests to provide evidence of a positive and significant causal relationship going from stock market development to economic growth, particularly for less developed countries.

*Abstrakt.* Jednou z dle itých ekonomických otázek je zda-li rozvoj finan ního sektoru ovliv uje ekonomický r st, nebo jestli je pouze následkem zvýšené ekonomické aktivity. Tento láněk se sna í vyplnit mezeru v sou asném výzkumu t chto kauzálních vztah\_. Pomocí Grangerova testu na kauzalitu je empiricky prokázán pozitivní a signifikantní kauzální vazba od rozvoje kapitálového trhu k ekonomickému r\_stu, zvlášt\_ pro mén\_ rozvinuté zem\_.

Keywords: stock market, financial development, economic growth, Granger causality.

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## **1. Introduction**

One of the most enduring debates in economics is whether financial development causes economic growth or whether it is a consequence of increased economic activity. Schumpeter (1912) argued that technological innovation is the force underlying long-run economic growth, and that the cause of innovation is the financial sector's ability to extend credit to the "entrepreneur" (see also Hicks, 1969). Joan Robinson, on the other hand, maintained that economic growth creates a demand for various types of financial services to which the financial system responds, so that "where enterprise leads finance follows" (1952, p. 86).

Empirical investigations of the link between financial development in general and stock markets in particular and growth have been relatively limited. Goldsmith (1969) reports a significant association between the level of financial development, defined as financial intermediary assets divided by GDP, and economic growth. He recognized, however, that in his framework there was "no possibility of establishing with confidence the direction of the causal mechanisms (p. 48)." A number of subsequent studies have adopted used the growth regression framework in which the average growth rate in per capita output across countries is regressed on a set of variables controlling for initial conditions and country characteristics as well as measures of financial market development (see King and Levine (1993a), Atje and Jovanovic (1993), Levine and Zervos (1996), Harris (1997), and Levine and Zervos (1998) among others).

All of these studies face a number of potential problems. In particular, they must deal with issues of causality and unmeasured cross country heterogeneity in factors such as savings rates that may cause both higher growth rates and greater financial sector development (see Caselli et. al

(1996). A number of techniques have been adopted to attempt to deal with these issues including (a) using only initial values of financial variables (King and Levine (1993), (b) using instrumental variables (Harris (1997)), and (c) examining cross-industry variations in growth that should be immune to country specific factors (Demirgüç-Kunt and Maksimovic (1996) and Rajan and Zingales (1998)).

A more difficult question arises with respect to whether the forward-looking nature of stock prices could be driving apparent causality between stock markets and growth. Current stock market prices should represent the present discounted value of future profits. In an efficient equity market, future growth rates will, therefore, be reflected in initial prices. This argues for using turnover (sales over market capitalization) as the primary measure of development, thereby purging the spurious causality effect because higher prices in anticipation of greater growth would affect both the numerator and the denominator of the ratio.

We address issues of causality in the framework introduced by Granger (1969). Granger causality tests have been widely used in studies of financial markets as well as several studies of the determinants of economic growth including savings (Carroll and Weil, 1994); exports (Rahman and Mustafa, 1997, Jin and Yu, 1995); government expenditures (Conte and Darrat, 1988)); money supply (Hess and Porter, 1993); and price stability (Darrat and Lopez, 1989).<sup>1</sup>

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<sup>1</sup>The studies cited are illustrative of many others looking at each potential determinant of growth. Others have used the Granger causality framework to examine the link between factors such as privatization, literacy and defense spending and growth.

A limited number of previous studies have used Granger causality to examine the link between financial markets and growth. Thornton (1995) analyzes 22 developing economies with mixed results although for some countries there was evidence that financial deepening promoted growth. Spears (1991) reports that in the early stages of development financial intermediation induced economic growth in Sub-Saharan Africa, while Ahmed and Ansari (1998) report similar results for three major South-Asian economies. Finally, Neusser and Kugler (1998) report that financial sector GDP Granger-caused manufacturing sector GDP in a sample of thirteen OECD countries.

In summary, previous empirical research has suggested a connection between stock market development and economic growth, but is far from definitive. Although the relationship postulated is a causal one, most empirical studies have addressed causality obliquely, if at all. Moreover, most studies have not adequately dealt with the fact that efficient markets should incorporate expected future growth into current period prices.

## **2. Data and Methodology**

Because we compare results from different countries, it is important that the data be consistently defined across countries.<sup>2</sup> In order to achieve as much consistency as possible, we rely on data from the International Finance Corporation (IFC 1998 and earlier editions) for financial

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<sup>2</sup>According to a classification from the International Federation of Stock Exchanges (see the discussion at <http://www.fibv.com/>) some stock exchanges count as turnover only those transactions that pass through their trading systems while others include all transactions subject to supervision by the market authority including those that take place off-market. In addition some sources compute turnover as annual sales over market capitalization averaged over the past twelve months, while others use the average of monthly sales to monthly market capitalization.

markets while growth rates and per capita GDP were obtained from International Monetary Fund's *International Financial Statistics* (various months). We were able to obtain consistent data for 64 countries for varying time periods beginning either in 1985 or the first year that the IFC reported data for the market and ending in 1997. The list of countries used and periods covered are contained in Table 1.<sup>3</sup> In total, we have 847 country/year observations, although because of missing values we use slightly over 750 observations for analyzing any given financial variable.

Stock market development is measured by three variables: (1) market capitalization over GDP, (2) turnover velocity, and (3) the change in the number of domestic shares listed. While we report results for whether market capitalization “causes” growth, interpretation of these results is particularly problematic since, as discussed above, efficient markets will reflect future earnings growth in current prices. Since earnings growth should be closely related to overall economic growth, this will make it look like increases in market capitalization preceded and, therefore, “caused” economic growth even if the true link ran in the reverse direction. We must, therefore, find indicators of market development that are independent of stock prices. Given that the role of a market is to reallocate capital to its most productive uses, the best such indicator may be the turnover velocity (the ratio of turnover to market capitalization). Finally, we also examine the annual percentage increase in the number of listed companies as an indication of financial deepening.

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<sup>3</sup>It should be noted that some series are not available for some countries for the full period analyzed.

Since it is likely that the impact of stock market development on growth will vary across levels of development we provide estimates of the causal connection for countries divided into three groups according to per capita income.<sup>4</sup> Finally, if financial markets promote growth, they should be better able to do so when not distorted by government policy. Thus, we calculate an indicator of financial market freedom based on the Heritage Foundation/Wall Street Journal *1999 Index of Economic Freedom*.<sup>5</sup> We grouped countries according to their score on the two aspects of economic freedom most closely related to financial markets: capital flows and foreign investment, and banking. The first aspect ranks countries from 1 (indicating open and impartial treatment of foreign investment and accessible foreign investment code) to 5 (where the government seeks to actively prevent foreign investment and there is rampant corruption). The second aspect ranks countries from 1 (those with few or no government controls on domestic or foreign banks, enabling them to engage in all types of financial services, and where there is no deposit insurance) to 5 (countries where financial institutions are in chaos, banks operate on a primitive basis, most credit goes to state owned enterprises, and corruption is rampant). The sample is divided into three groups according to

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<sup>4</sup>The groups are upper income countries, upper middle income countries, and other countries (primarily lower middle income but including some lower income) according to World Bank's 1998 classification. This classification is also the basis for the IFC's definition of "mature" and "emerging" markets. A country's classification as an "emerging" or "mature" market does not depend on the level of its stock market development or other economic institutions, but instead merely on whether its GNP per capita is below or above the World Bank's threshold for a "high income country" (USD 9,656 in 1998). Although the IFC is currently considering a revision to incorporate institutional aspects of market maturity into its definition of emerging markets, the results of this revision are not available at this time.

<sup>5</sup>We recognize that ideally we should use measures of economic freedom that correspond to either the beginning of our sample period or to the entire period under study, but such measures are not available. Were they available it is likely that they would be highly correlated with the 1999 measures.

whether the combined rating is lower than 4, equal to 5 or 6, or equal to or above 7. The lower the score, the more financial freedom there is in the economy.<sup>6</sup>

Table 2 presents the sample statistics for the key variables for the full sample and the income and financial market freedom subgroups. Over our time period, lower income countries grew more rapidly than higher income ones while, because they also tend to be the richest markets, freer markets appeared to grow less rapidly than less free ones. As might be expected, both market capitalization/GDP and turnover/market capitalization are higher for higher income markets.

Granger causality tests rely on estimating two basic equations:

$$Y_t = \alpha_0 + \sum_{i=1}^{k_1} \alpha_i Y_{t-i} + \sum_{i=1}^{k_2} \beta_i X_{t-i} + \varepsilon_t \quad (1)$$

and

$$X_t = \gamma_0 + \sum_{i=1}^{k_3} \gamma_i Y_{t-i} + \sum_{i=1}^{k_4} \delta_i X_{t-i} + v_t \quad (2)$$

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<sup>6</sup>We also grouped countries based on the share of domestic credit provided by the banking sector as a percentage of GDP using data from the World Bank (1999, Table 16). Countries are classified in three groups: if bank credit was over 80% of GDP, between 41 and 80% of GDP, and lower than 40% of GDP. Results were inconsistent and generally insignificant across groups and are, therefore, not reported. High bank credit may indicate an overall well-developed financial sector, but it may also indicate countries where effective substitutes for equity markets make such markets less important in determining growth.

where  $X$  denotes an indicator of stock market development,  $Y$  denotes economic growth and the subscripts  $t$  and  $t-i$  denote the current and lagged values. Hsiao (1981) suggests searching over the lag lengths ( $k_1$  to  $k_4$ ) and applying an information criterion to determine the optimal length of the lag structure. We used the three most common choices of information criteria (Akaike, 1969; Hannan and Quinn, 1979; and Schwarz, 1978) but found that more than one lag in either  $X$  or  $Y$  was never optimal.

We must also address the fact that the presence of lagged values of the dependent variable on the right-hand side of Equations (1) and (2) in a dynamic panel data framework can lead to inconsistent parameter estimates unless the time dimension of the panel is very large (Nerlove (1967), Nickell (1981) and Keane and Runkle (1992)). Anderson and Hsiao (1981) propose using twice-lagged levels of the right-hand side variables as instruments.<sup>7</sup> Arellano and Bond (1991) suggest two GMM variants of the Anderson and Hsiao estimators. Kiviet (1995) suggests an alternative approach involving direct calculation of biases and correcting of least squares estimates. Simulation results in Judson and Owen (1996) have shown that Anderson-Hsiao estimators, while the least biased among the available alternatives, are considerably less efficient than the alternative proposed by Kiviet. On the other hand, extension of Kiviet's estimator to unbalanced panels, while conceptually possible, is computationally unfeasible. In our case, imposing the restriction that the panel be balanced would result in a considerable loss of data since emerging markets necessarily emerged to the point where data were available at different times.

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<sup>7</sup>They also discuss the possibility of using lagged differences as estimates, but others (Arellano (1989) and Kiviet (1995) for example) have established the superiority of using twice-

Given the complications and efficiency loss imposed by attempting to correct for bias in estimates of the coefficients in Equations (1) and (2) arising from the dynamic panel nature of the data, we rely on simulations results in Judson and Owen (1999) showing that bias problems are almost entirely concentrated in the coefficient on the lagged dependent variables, while biases in the coefficients of independent variables (beta and delta in Equations (1) and (2)) are “relatively small and cannot be used to distinguish between estimators [including OLS] (p. 13).” Given that we are not interested in point estimates of these coefficients, that any biases that exist apparently work against our finding significant causality, and that correction for biases would result in a significant loss of efficiency that would do more damage to a search for causal relationships than a relative small coefficient bias, we have elected to ignore bias corrections in the results that follow.

#### **4. Results**

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lagged levels over lagged differences.

Equations 1 and 2 were first estimated independently for each country for which we had six or more years of data. Given that our longest time series was only thirteen years, we were never able to reject an hypothesis of equality of coefficients within any income or financial freedom group. Thus, we pool observations across countries within each income and financial freedom group as well as for the entire sample to create an unbalanced panel. We estimated both country-fixed and random-effect models, although in every case we reject the hypothesis that the random effects are orthogonal to the regressors (Hausman, 1978).<sup>8</sup> Tables 3 and 4, therefore, present fixed-effect models. The first row within each country group presents OLS regression estimates of Equation 1 for all countries and years within that group, ignoring the panel structure of the data except for correcting the standard errors to account for heterogeneity of the residuals. The second row presents between-country estimates in which OLS regressions were run on country-mean values, estimating results only on the cross-country variance in the variables. The third and final row in each group presents Least Squares Dummy Variable (LSDV) estimates, identifying the effect of financial factors of growth only from the variance within each country (since cross-country variance is absorbed by the country dummies).

Several results stand out in Table 3. Lagged growth rates are, in general, significant predictors of current growth rates. This effect is quite strong for high and middle income countries and relatively weak for lower income countries, suggesting that macroeconomic conditions are less stable for the less developed countries in our sample. The effect relating past growth to current growth is much more pronounced between countries than within countries, suggesting that there is

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<sup>8</sup>Results are available on request.

strong hysteresis in the pattern of growth rates across countries, even though macroeconomic variation continues to exist within any given country. As discussed above, however, there may be substantial bias in these coefficients, so they should be interpreted with caution.

Turning to financial variables, as expected there is a positive link between market capitalization (normalized for the level of GDP) and future economic growth. This link, however, is likely to be because efficient markets incorporate anticipated future growth into current period prices and, therefore, market capitalization. Some suggestion that this may be the underlying cause of the link between market capitalization and growth can be seen in the pattern of results across income groups and countries. The link exists only within countries, and is more significant for higher income countries. It is not surprising that more developed financial markets are more efficient and, therefore, better able to incorporate anticipated future growth into current prices.

The pattern is striking with respect to turnover velocity, which, as we argued earlier, should be a better indicator of the effect of stock markets on growth because it has been purged of forward-looking price effects. Results suggest that a higher turnover velocity Granger-causes growth, but only for high and low income countries. There is no effect for countries in the middle income group. Furthermore, the location of the effect differs between the high and low income countries. For high income countries the link between turnover velocity and growth is entirely within countries, while for lower income countries the linkage is quite strong and is found between countries.<sup>9</sup> This result is particularly important. For low income countries, having a more active stock market is associated

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<sup>9</sup>We are unsure how to interpret the connection between turnover velocity within a country and its future growth for upper-income countries. Perhaps this results from the very active markets and rapid economic growth that have been common to OECD countries in the past few years.

with substantially higher rates of growth<sup>10</sup>. A increase of one standard deviation in stock market activity in a low income country is associated with a 2.5 percentage point (57 per cent at the mean) increase in growth rate. It is clear from these results that an active stock market is crucial in reallocating capital to high value uses in developing countries. Without such a market, growth in low and lower middle income countries is substantially lower than it could be were such an active stock exchange to be present.

Unlike with turnover velocity, there is no evidence that a change in the number of listed domestic companies is linked to differing rates of economic growth. Similarly, the reverse causality relationships were almost never significant and are, therefore, not reported.<sup>11</sup> There is one significant exception to this generalization. Between countries in the low income group, higher growth does appear to Granger-cause increased market capitalization. Combined with the fact that this was the only income group for which market capitalization did not Granger-cause growth, this result

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<sup>10</sup>These results differ from those in Harris (1997) whose 2SLS results show that the link between stock markets and growth exists only for developed countries. In OLS regressions using lagged values to control for endogeneity, however, he finds exactly the reverse pattern, with equity markets being important for growth only in less developed countries. Thus, the difference in results may be largely due to the poor quality of the instruments available for use in the two-stage procedure.

<sup>11</sup>Again, results are available on request.

reinforces the conclusion that the link between market capitalization and growth in developed markets is a result of efficient markets instantaneously reflecting changes in growth rates in equity prices. In the least developed markets, where such efficiency is lacking, higher growth may actually have to be observed before it increases stock prices.<sup>12</sup>

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<sup>12</sup>An alternative hypothesis is that international investors active in developing markets use growth rates as a signal for the markets into which they wish to shift capital.

Table 4 repeats the analysis for subsamples of countries defined according to the degree of freedom from government or other interference with which financial markets operate. The results suggest an important caveat to the results in Table 3. There is a significant relationship between lack of government interference in financial markets and income level such that two-thirds of the observations in the lowest financial freedom category are also in the lowest income group.<sup>13</sup> The link between market activity and growth seen for low income countries as a whole does not apply to this subgroup of low income countries. Indeed, there is even a hint of perverse results for these countries, such that more active stock markets actually inhibit growth in countries where there is little financial freedom. If we recall that one of the defining characteristics of these countries is rampant corruption, it is possible that in these countries an active stock market is simply another vehicle through which assets may be stolen from legitimate investors. The implication is that for stock markets to cause growth there must first be at least a moderate degree of normality in the operations of these markets.

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<sup>13</sup>We can speculate about the direction of causality here but offer no evidence as to whether lack of government interference in financial markets promotes or is a consequence of growth.

## 5. Conclusions

In summary, using a large number of countries with varying economic conditions and levels of stock market activity, we find:

- 1) evidence that stock markets, especially in more developed economies, incorporate expected future growth into current prices, a result that is consistent with efficient market hypotheses;
- 2) a strong relationship between stock market activity and future economic growth for the low and lower middle income countries in our sample but not in higher income countries with more developed alternative financial mechanisms; and
- 3) no impact of increased equity market activity on growth in developing economies where the lack of a proper institutional framework (as evidenced by excessive corruption or government interference in financial markets) hampers the ability of these markets to function.

It is interesting to speculate whether this pattern of results can say anything with respect to the various explanations that have been advanced for why there might be a connection between stock market development and economic growth. Several possible mechanisms for such a connection have been advanced. Among these are:

- 1) the fact that a more developed equity market may provide liquidity that lowers the cost of the foreign capital that is essential for development, especially in low income countries that cannot generate sufficient domestic savings (WIDER (1990), Bencivenga et. al. (1996), and Neusser and Kugler (1998)).

- 2) the role of equity markets in providing proper incentives for managers to make investment decisions that affect firm value over a longer time period than the managers' employment horizons through equity-based compensation schemes (Dow and Gorton (1997)).
- 3) the ability of equity markets to generate information about the innovative activity of entrepreneurs (King and Levine (1993b) or the aggregate state of technology (Greenwood and Jovanovic (1990)).
- 4) the role of equity markets in providing portfolio diversification, enabling individual firms to engage in specialized production, with resulting efficiency gains ( Acemoglu and Zilibotti (1997)).
- 5) the fact that diverse equity ownership creates a constituency for political stability, which, in turn, promotes growth (Perotti and van Oijen (1999)).

All of these channels (and many others) are likely to play a role. The fact that the links are stronger in low income countries points especially to the role of equity markets in attracting foreign capital while the link between political institutions and the ability of stock markets to promote growth suggests that the last may also play an important role.

From these results it is clear that an active equity market is an important engine of economic growth in developing countries. Public policy and international aid directed toward introducing and fostering such markets while creating an institutional framework that is free of corruption and excessive government control should have a large impact in increasing long-term growth rates and economic well-being in much of the world.

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**Table 1****Countries Included in Analysis by Income Category and Years Available**

High Income Group		Upper Middle Income		Low Middle and Low Income	
Country	Time span	Country	Time span	Country	Time span
Australia	1985-1997	Argentina	1985-1997	Bangladesh	1985-1997
Austria	1985-1997	Botswana	1991-1997	China	1991-1997
Belgium	1985-1997	Brazil	1985-1997	Columbia	1985-1997
Canada	1985-1997	Chile	1985-1997	Ecuador	1993-1997
Denmark	1985-1997	Czech Republic	1994-1997	Egypt	1985-1997
Finland	1985-1997	Hungary	1991-1996	India	1985-1997
France	1985-1997	Malaysia	1985-1997	Indonesia	1985-1997
Germany	1985-1997	Mauritius	1990-1997	Iran	1991-1996
Hong Kong	1985-1997	Mexico	1985-1997	Jamaica	1986-1997
Iceland	1994-1997	Oman	1989-1997	Jordan	1986-1997
Ireland	1994-1997	Poland	1991-1997	Kenya	1989-1997
Italy	1985-1997	Saudi Arabia	1991-1996	Morocco	1985-1997
Japan	1985-1997	Slovakia	1994-1997	Namibia	1993-1996
Luxemburg	1985-1992	South Africa	1985-1997	Nigeria	1985-1997
Netherlands	1985-1997	Trinidad Tobago	1985-1997	Pakistan	1985-1997
New Zealand	1985-1997	Turkey	1987-1997	Panama	1992-1997
Norway	1985-1997	Uruguay	1985-1997	Paraguay	1993-1996
Singapore	1985-1997	Venezuela	1985-1997	Peru	1985-1997
Spain	1985-1997			Philippines	1985-1997
Sweden	1985-1997			Sri Lanka	1985-1997
Switzerland	1985-1997			Thailand	1985-1997
UK	1985-1997			Tunisia	1985-1997
US	1985-1997			Zimbabwe	1985-1997
Cyprus	1991-1997				
Greece	1985-1997				
Israel	1985-1997				
Korea	1985-1997				
Portugal	1985-1997				

**Table 2****Sample Characteristics**

Group	Statistics	GDP growth	Market Cap/GDP	Turnover/Market Cap	Change in No. of Companies
All Countries	Mean	3.8	41.28	0.33	-47.43
	Std. Error	3.86	59.56	0.37	902.17
	No. of obs.	847	762	761	753
High Income	Mean	3.28	58.75	0.44	-12.64
	Std. Error	2.79	71.39	0.38	126.3
	No. of obs.	358	337	333	336
Upper Middle Income	Mean	3.9	40.54	0.29	-10.82
	Std. Error	4.5	60.24	0.35	140.99
	No. of obs.	197	179	179	172
Lower Middle and Low Income	Mean	4.38	17.87	0.2	-98.95
	Std. Error	4.42	20.56	0.32	1556.76
	No. of obs.	292	246	249	243
High Financial Freedom	Mean	3.22	53.34	0.33	-21.94
	Std. Error	3.7	72.63	0.31	278
	No. of obs.	382	339	334	338
Medium Financial Freedom	Mean	4.35	34.04	0.35	-19.02
	Std. Error	3.81	46.9	0.43	246.82
	No. of obs.	391	365	365	356
Low Financial Freedom	Mean	3.88	16.33	0.17	5.71
	Std. Error	4.56	14.01	0.17	24.33
	No. of obs.	74	58	62	58

**Table 3**

**Tests of Granger Causality Running from Financial Variables to Growth  
(Countries Grouped by Income)**

Group		X = Market Cap/GDP		X = Turnover/ Market Cap		X = Change in No. of Companies	
		Lagged Y	Lagged X	Lagged Y	Lagged X	Lagged Y	Lagged X
All Countries	Total	.420** (.042)	.003* (.001)	.419** (.042)	.956** (.314)	.459** (.045)	-.002* (.0001)
	Between	.646** (.078)	.002 (.004)	.586** (.073)	1.90** (.710)	.893** (.036)	-.003 (.003)
	Within	.159** (.050)	.007** (.002)	.293** (.035)	1.04* (.431)	.209** (.058)	.000004 (.000005)
High Income	Total	.618** (.060)	.003* (.001)	.609** (.059)	.886* (.438)	.631** (.058)	-.0004 (.009)
	Between	1.073** (.023)	-.005 (.677)	1.058** (.024)	-.248 (.200)	.959** (.054)	.001 (.003)
	Within	.315** (.076)	.005** (.002)	.303** (.077)	1.332** (.433)	.349** (.075)	-.0004 (.001)
Upper Middle Income	Total	.336** (.078)	.007* (.004)	.363** (.077)	.281 (.755)	.373** (.086)	.002 (.001)
	Between	.812** (.086)	.001 (.005)	.701** (.099)	1.393 (1.363)	.894** (.100)	-.002 (.005)
	Within	.071 (.095)	.010+ (.005)	.094 (.097)	.308 (.838)	.238** (.079)	.002 (.002)
Lower Middle and Low Income	Total	.302** (.073)	.006 (.012)	.222** (.074)	3.397** (.777)	.380** (.082)	-.0001** (.00001)
	Between	.301 (.182)	-.004 (.032)	-.195 (.131)	7.848** (1.221)	.846** (.059)	-.0003 (.0003)
	Within	.131+ (.080)	.013 (.013)	.157+ (.081)	-.759 (1.056)	.220** (.098)	-.00001 (.00002)

\*\* = Significant at the 1% confidence level  
 \* = Significant at the 5% confidence level  
 + = Significant at the 10% confidence level

**Table 4**

**Tests of Granger Causality Running from Financial Variables to Growth  
(Countries Grouped by Financial Freedom)**

Group		X = Market Cap/GDP		X = Turnover/ Market Cap		X = Change in No. of Companies	
		Lagged Y	Lagged X	Lagged Y	Lagged X	Lagged Y	Lagged X
All Countries	Total	.420** (.042)	.003* (.001)	.419** (.042)	.956** (.314)	.459** (.045)	-.002* (.0001)
	Between	.646** (.078)	.002 (.004)	.586** (.073)	1.90** (.710)	.893** (.036)	-.003 (.003)
	Within	.159** (.050)	.007** (.002)	.293** (.035)	1.04* (.431)	.209** (.058)	.000004 (.000005)
High Financial Freedom	Total	.409** (.062)	.004* (.002)	.434** (.062)	.637 (.427)	.478** (.070)	-.001 (.0004)
	Between	.763** (.080)	.001 (.003)	.691** (.077)	1.219 (.975)	.891** (.069)	-.0004 (.002)
	Within	.212** (.074)	.005** (.002)	.233** (.076)	1.100 (.502)	.296** (.089)	-.001** (.0003)
Medium Financial Freedom	Total	.442** (.064)	.004 (.003)	.418** (.064)	1.211** (.454)	.478** (.063)	-.001* (.0002)
	Between	.547** (.143)	.004 (.010)	.430** (.139)	2.699* (1.132)	.916** (.045)	-.0004 (.002)
	Within	.113 (.075)	.011* (.005)	.129* (.075)	.237 (.644)	.171* (.078)	-.001 (.0003)+
Low Financial Freedom	Total	.187 (.087)	-.030 (.031)	.176+ (.090)	1.331 (2.032)	.219* (.099)	-.002 (.010)
	Between	1.117* (.270)	-.018 (.030)	1.347* (.262)	-2.724 (2.797)	.936** (.094)	.007 (.041)
	Within	.013 (.113)	.019 (.047)	.003 (.121)	-5.013+ (2.645)	-.045 (.164)	.002 (.006)

\*\* = Significant at the 1% confidence level  
 \* = Significant at the 5% confidence level  
 + = Significant at the 10% confidence level