

EMPIRICAL EVIDENCE OF THE ROLE OF FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN CARIBBEAN COUNTRIES

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Keywords: Financial market, stock market, economic growth, bounds test, Granger causality, long-run weak exogeneity

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Abstract

The paper examines the role of financial development and economic growth in Barbados, Jamaica and Trinidad and Tobago. Structural break points are determined by using the Quandt-Andrews method for all financial development proxies and economic growth. Causality tests conducted by using the stepwise Granger causality method, after addressing respective unknown exogenous structural changes, and using bounds testing approach to determine the level relationships between economic growth and each respective real financial development proxies, produced more robust results. Thus, economic growth drives real financial development in the short-run in all three countries, with Trinidad-Tobago's results being overwhelming. Long-run weak exogeneity tests from respective factor loadings indicate similar demand-following phenomenon in Jamaica, although results are mixed in Barbados and Trinidad-Tobago. Policymakers are therefore advised to make the overall economic growth of Jamaica their policy priority, and not favor its financial market with special policies over both near term and long-run. Similar policy is strongly recommended for Trinidad-Tobago. However, in Barbados and Trinidad-Tobago, mixed Granger causal relationship results suggest that extending resources as incentives to boost up both financial market development and economic growth will benefit them over the long-run.

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Schumpeter (1934) argued that credits from financial institutions which serve as capital to fund innovations of entrepreneurs are crucial for economic growth than self-financing.

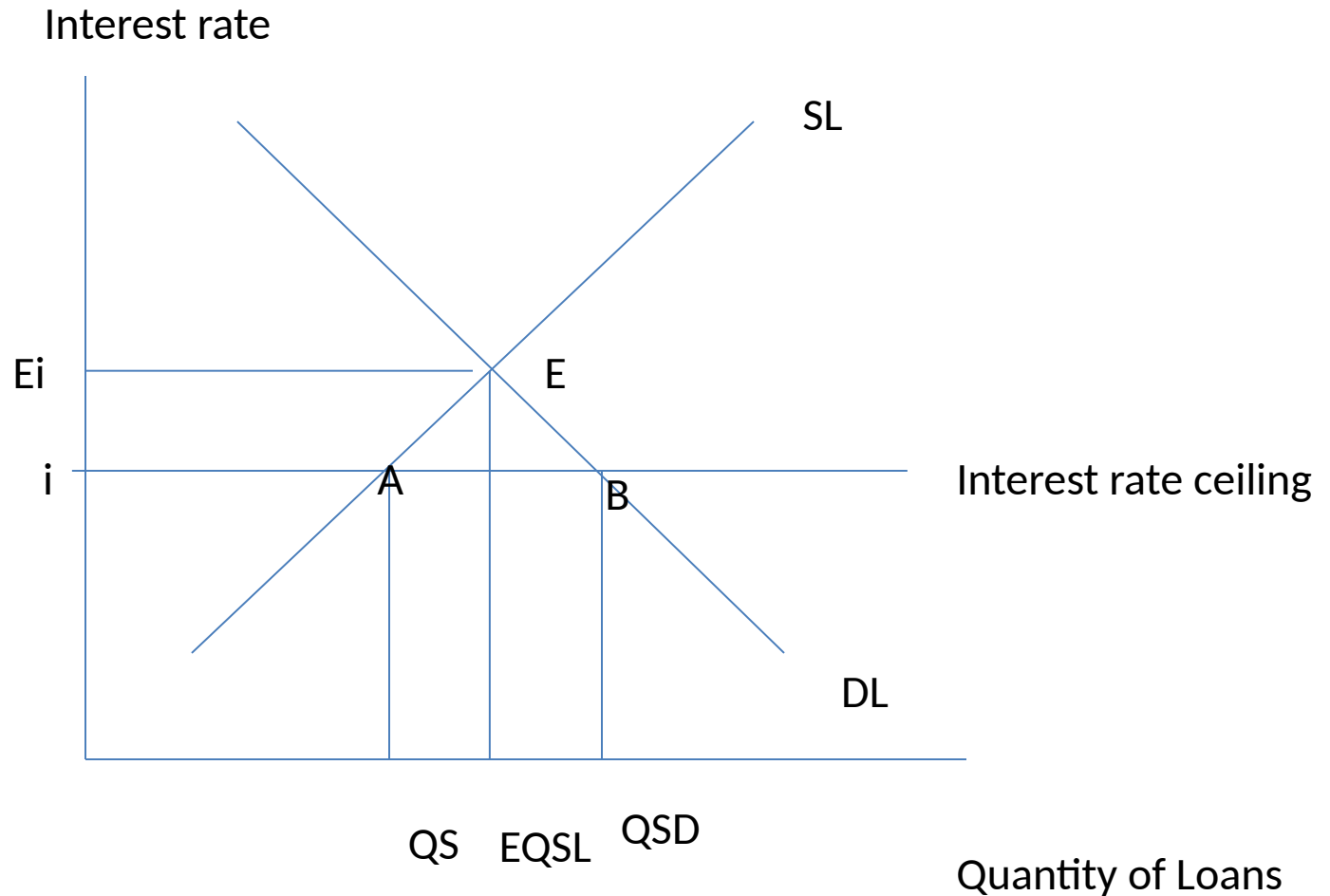
His views was further supported by Keynes (1936) in his claim: “If the grant of a bank credit to an entrepreneur additional to credits already existing allows him to make an addition to current investment which will not have occurred otherwise, incomes will necessarily be increased and at a rate which will exceed the rate of increased investment.”

Robinson viewed financial development to be a response to economic growth as firms develop institutions and instruments to match increased demand for financial services.

**Joan Robinson (1979, pp. 20-21),
*Generalization of the generalized theory and other essays***

“There is a general tendency for the supply of finance to move with the demand for it. It is true, of course, that at any moment there are many excellent ideas which cannot be implemented because those who conceived them are unable to back them with finance. But, by and large, it seems to be the case that where enterprise leads finance follows. The same impulses within an economy which set enterprise afoot make owners of wealth venturesome, and when a strong impulse to invest is fettered by lack of finance devices are invented to release it (the invention of the joint-stock company with limited liability was a technical revolution comparable to the invention of the steam engine), and habits and institutions are developed accordingly (it was possible for the prejudice against banks participating in industry to take root in England, where other sources of finances were forthcoming, but not in Germany, where they were not).”

Figure 1: Repressive market due to government or state control



Where, AB is excess demand for loans

QS is Quantity of loans supplied or savings

QSD is Quantity of loans demanded in the market

Endogenous Growth Model

$$Y_t = AK_t \quad (\text{AK model}) \quad (1)$$

$$I_t = K_{t+1} - K_t + \delta K_t \quad (2)$$

At equilibrium,

$$I_t = \varphi S_t \quad (3)$$

where, φ is the fraction of saving derived from the financial intermediation process.

Efficiency in the financial intermediation process augments φ .

The fraction of saving lost through the financial intermediation process is $(1 - \varphi)$. It increases when there is increase in the spread between lending and borrowing rate, commission, fees, etc.

Equation (1) can be expressed as

$$\ln Y_t = \ln A + \ln K_t$$

Differentiating w.r.t. time t ,

$$(1/Y_t)(dY_t/dt) = g = (1/K_t)(dK_t/dt) \quad (4)$$

$$g = (1/K_t)(I_t - \delta K_t)$$

In the Steady State

$$I_t = \varphi S_t$$

So equation (4) becomes

$$= (1/K_t)(\varphi S_t - \delta K_t) \quad (5)$$

Substituting $K_t = (Y_t/A)$ into equation (5) we obtain

$$\begin{aligned} g &= A\varphi S_t(1/Y_t) - \delta \\ &= A\varphi s_t - \delta \end{aligned} \quad (6)$$

where,

g is the steady state growth rate.

A is social marginal productivity of capital. It is increased by intermediaries.

φ is the proportion of saving that is funnelled to investment through the process of financial intermediation.

s_t is private saving rate

An increase in A and/or φ and/or s_t by financial intermediaries and the intermediation process results in economic growth which is measured by an increase in g.

Thus, whereas

Goldsmith (1969): FD → increase efficiency of investments → increase EG

McKinnon (1973) and Shaw (1973): FD → enhances investments → increase EG

Advantages: Insightful and FD have level effect on output

Problem: Absence of growth effect and analytical foundation.

Endogenous growth models show that FD have both level effect on output and growth effect on EG

Bencivenga and Smith (1991) → FD (through banks)

Roubini and Sala-i-Martin (1991) → FD (through banks)

Greenwood and Jovanovic (1990), Levine (1991) → FD (through stock markets)

Saint Paul (1992)

Lucas (1988), although attributed some contributions of financial development to economic growth, considered the effect to be exaggerated in the literature.

Thus, the literature suggests the following: That

- 1. Financial development “Granger causes” economic growth, or**
- 2. Economic growth “Granger causes” financial development, or**
- 3. Financial development and economic growth occur concurrently, or**
- 4. Financial development and economic growth are independently related.**

Which of these relationships hold for Barbados, Jamaica and Trinidad and Tobago to inform policy? What are the policy implications?

Literature Review: Empirical Studies on Financial Development and Economic Growth include the following: Granger causality tests. Growth regression studies, Endogenous growth models, and Non-linear growth models

- (1) Granger Causality Studies include**
 - (a) Ang and McKibbin (2007)**
 - (b) Calderon and Liu (2003)**
 - (b) Demetriades and Hussein (1996)**
 - (c) Jung (1986)**
 - (d) Fritz (1984)**
- (2) Growth Regression Studies include**
 - (a) Beck and Levine (2004)**
 - (b) Christopolous and Tsionas (2004)**
 - (c) Levine and Zervos (1998)**
 - (d) Levine (1998)**
- (3) Endogenous Growth Models Studies include**
 - (a) Roubini and Sala-i-Martin (1992)**
 - (b) Saint Paul (1992)**
 - (c) Bencivenga and Smith (1991)**
 - (d) Greenwood and Jovanovic (1990)**
- (4) Non-linear Growth Models Studies include**
 - (a) Shen, et al. (2011)**
 - (b) Huang and Lin (2007)**
 - (c) Rioja and Valev (2004)**
 - (d) Khan and Senhadji (2003)**
 - (e) Deidda and Fattouh (2002)**
 - (f) Xu (2000)**

Table 1: Summary results of some financial development and economic growth studies

Authors	Countries	Period	Variables	Methodology	Findings
Jung (1986)	56 Countries	1950-1981	Currency/M1 ratio, M2/GDP (or GNP) ratio, yn	Granger causality test	FD \Rightarrow yn for LDCs, yn \Rightarrow FD for DCs
Darrat (1999)	Turkey, UAE, Saudi Arabia	1964-1993	Currency/M1 ratio, M2/GDP ratio, y	Granger causality test using a VECM	Mixed results
Arestis et al. (2001)	DCs	1962:2-1998:1	Market capitalization/GDP ratio, DBC/GDP ratio, Stock market volatility, y	Granger causality test using ECM, Bivariate and Trivariate models	FD \Rightarrow y

Notes: FD is financial development variable which include alternative banking and stock market proxies, yn is real GDP, FIR (=TDC/NDCF) is financial interrelations ratio, NIR (=PSNI/NDCF) is new issue ratio, TDC is total debt credit, PSNI is primary securities of nonfinancial institutions, NDCF is net domestic capital formation at current prices, M = M3/GDP, A = BA/(BA + CBA), P = PC/GDP, FDI is financial development index, RI is real interest rates, BA is commercial bank assets, CBA is central bank assets, ED is yn, FRI is financial repression index, PC is private sector credit, DC is domestic credit, LL is liquid liabilities, and M2 is broad money, LDCs are less developed countries, DCs are developed countries, DBC is domestic bank credit, LA-VAR is lagged augmentation vector autoregressive; \Rightarrow denotes causal direction and \Leftrightarrow denotes bidirectional causation.

Continuation of Table 1

<p>Beck and Levine (2004)</p>	<p>40 Countries</p>	<p>1976-1998</p>	<p>Turnover/GDP ratio, Value added/GDP ratio, Bank credit/GDP ratio, Average years of schooling, trade openness, government consumption, inflation rate. Black market premium, initial income capita, yn</p>	<p>Production function using panel system estimators, and GMM estimator</p>	<p>Only stock market ⇒ yn</p>
<p>Caporale et al. (2004)</p>	<p>7 Countries</p>	<p>1977:1-1998:4</p>	<p>GDP, Market capitalization/GDP ratio, Value traded/GDP ratio, Bank deposit liabilities/GDP ratio, Bank claims on the private</p>	<p>Granger causality test using a LA-VAR model</p>	<p>Generally FD ⇒ GDP</p>
<p>Chang and Caudill (2005)</p>	<p>Taiwan</p>	<p>1962-1991</p>	<p>M2/GDP, Exports, Imports, yn</p>	<p>Granger causality test using a VECM</p>	<p>FD ⇒ yn</p>

Continuation of Table 1

Hondroyiannis et al. (2005)	Greece	1986-1999	Total market capitalization/GDP ratio, Industrial market capitalization/GDP ratio, Total bank credit/GDP ratio, Bank credit to industry/GDP ratio	Granger causality test using a VECM	Bidirectional causation, $FD \Leftrightarrow yn$
Ang and McKibbin (2007)	Malaysia	1960-2001	M, A, P, FDI, ED, RI, and \FRI	Granger causality test using a VECM	$ED \Rightarrow FDI$
Singh (2008)	India	1952-1996	FIR, NIR, yn	Granger causality test using an ECM	Bidirectional causation, $FD \Leftrightarrow yn$

⇒

The object of this study is to examine empirically the role of financial development to economic growth or vice versa in both short- and long-run for three Caribbean economies, namely: Barbados, Jamaica and Trinidad-Tobago.

We employ the following:

(A) The traditional Granger causality test for the short-run by using

Hsiao's stepwise method after determining the stationarity properties of the variables with the following tests:

- (i) Different unit roots tests, and**
- (ii) PSS (2001) bounds test.**

(B) The long-run weak-form exogeneity test by using Johansen's VECM to estimate the associated factor loadings.

Research originality:

This is the only recent study on financial development (FD) and economic growth (EG) which employs six different FD proxies to capture each effect on EG in three Caribbean countries.

Unlike previous studies which treated several countries as a homogenous group in panel studies within the framework of growth models, this study employs temporal and long-run Granger causality to adequately address dynamic effect of the variables.

It is also the first study that uses both bounds tests and traditional unit roots test rather than relying solely on the latter to determine stationarity properties of each variable in a causality test.

Unlike the few Granger causality studies that impose structural change periods a priori, we relied on the model to determine the structural break dates by using the Quandt and Andrews' (QA) method.

It is the only study that provides robust results for three Caribbean countries and recommends policies to address their respective short-term and long-run development.

Financial development proxy variables include:

- (i) real domestic credits (dc)**
- (ii) real cash balances (m2)**
- (iii) currency-ratio* (cr)**
- (iv) real quasi money (qm), and**
- (v) liquid liabilities**
- (vi) market capitalization for capturing the role of the stock market (mca)**

As an added contribution to the empirical literature, we have addressed structural changes by using

- (a) Quandt (1960) and Andrew (1993) (QA) method which allows unknown exogenous structural change dates to be determined by the model.**

Sources of data:

The financial development and economic growth annual data are sourced from the website of the IMF's IFS, and the stock market development data are sourced from the website of Bank of Trinidad-Tobago, Annual Reports of Barbados Stock Exchanges, Trinidad-Tobago Stock Exchanges, Bank of Jamaica, and the website of The World Federation Exchanges.

Table 2: Determination of unknown exogenous structural break points using the QA method

Model (ypn, fd): $ypn = \beta fd + c$	Slope Coefficients (β)	No. of breaks compared	Max LR/W F-Stats	Period Chosen
Trinidad-Tobago				
(ypn, cpspn)	1.270[0.00]	37	177.98[0.00]	1969(D69)
(ypn, dcpn)	1.144[0.00]	31	9.159[0.00]	2004(D04)
(ypn, llpn)	1.153[0.00]	35	153.652[0.00]	1977(D77)
(ypn, mcapn)	1.201[0.00]	20	125.974[0.00]	1997(D97)
(ypn, mpn)	1.179[0.00]	35	115.110[0.00]	1977(D77)
(ypn, qmpn)	1.263[0.00]	35	158.916[0.00]	1970(D70)

Notes: fd is a column vector of financial development proxy variables which includes cpspn, dcpn, llpn, mcapn, mpn and qmpn, and economic growth per capita (ypn). Hansen's (1997) method is used to calculate p-values reported in square brackets. Both maximum LR F-statistics and Wald F-statistics yield the same results because of linear relationship between the variables.

Continuation of Table 2:

Model (ypn, fd): ypn = βfd + c	Slope Coefficients (β)	No. of breaks compared	Max LR/W F-Stats	Period Chosen
Barbados				
(ypn, cpspn)	1.041[0.00]*	30	66.757[0.00]*	2001(D01)
(ypn, dcpn)	3.899[0.00]*	29	48.769[0.00]*	1986(D86)
(ypn, llpn)	3.896[0.00]*	29	107.259[0.00]*	1995(D95)
(ypn, mcapn)	3.610[0.00]*	14	94.682[0.00]*	1997(D97)
(ypn, mpn)	1.025[0.00]*	30	112.017[0.00]*	2001(D01)
(ypn, qmpn)	1.044[0.00]*	30	127.017[0.00]*	1992(D92)
Jamaica				
(ypn, cpspn)	1.221[0.00]*	34	33.889[0.00]*	1969(D69)
(ypn, dcpn)	1.122[0.00]*	34	71.589[0.00]*	1971(D71)
(ypn, llpn)	1.108[0.00]*	25	47.522[0.00]*	1981(D81)
(ypn, mcapn)	0.892[0.00]*	28	177.99[0.00]*	1985(D85)
(ypn, mpn)	1.119[0.00]*	34	99.797[0.00]*	1969(D69)
(ypn, qmpn)	1.194[0.00]*	34	94.184[0.00]*	1968(D68)

Table 3: Unit root tests.

Variables	Level Form ADF(k=1)			First Difference Form ADF(k=1)		
	Barbados	Jamaica	Trinidad-Tobago	Barbados	Jamaica	Trinidad-Tobago
cpspn	1.663[0.97]	0.834[0.89]	1.266[0.94]	-4.002[0.00]*	-6.058[0.00]*	-3.911[0.00]*
dcpn	0.532[0.83]	1.999[0.99]	-0.385[0.54]	-10.412[0.001]*	-6.704[0.00]*	-3.247[0.00]*
llpn	2.828[0.99]	0.706[0.86]	1.543[0.97]	-4.422[0.00]*	-5.399[0.00]*	-3.586[0.00]*
mcapn	1.252[0.94]	3.036[0.99]	0.125[0.71]	-3.301[0.00]*	-4.036[0.00]*	-3.396[0.00]*
mpn	3.515[0.99]	1.503[0.96]	1.754[0.98]	-4.215[0.00]*	-6.266[0.00]*	-3.757[0.00]*
qmpn	3.390[0.99]	1.378[0.95]	1.880[0.98]	-4.488[0.00]*	-4.602[0.00]*	-2.254[0.02]**
ypn	1.882[0.98]	0.556[0.83]	0.858[0.89]	-4.606[0.00]*	-4.005[0.00]*	-5.596[0.00]*
	Level Form KPSS LM-Stat			First Difference Form KPSS LM-Stat		
cpspn	0.773	0.475	0.667	0.081	0.085	0.326
dcpn	0.791	0.672	0.206	0.500	0.397	0.362
llpn	0.761	0.571	0.683	0.168	0.182	0.143
mcapn	0.580	0.749	0.499	0.107	0.178	0.223
mpn	0.777	0.792	0.659	0.121	0.241	0.138
qmpn	0.806	0.812	0.680	0.077	0.275	0.205
ypn	0.802	0.570	0.331	0.223	0.087	0.090

Notes: Probability (p)-values are reported in square brackets and k denotes lag lengths. One-sided p-values from MacKinnon et al. (1999) are used as critical values of the ADF tests. The KPSS tests: at 0.01, 0.05 and 0.10 significance levels have the following critical values: 0.739, 0.463 and 0.347, respectively, for the case of an intercept; and 0.216, 0.146 and 0.119, respectively, for the case of an intercept and trend. All variables are expressed in logarithmic forms. See also Tables 2.

Table 4: Bounds tests of long-run ADL estimates of real per capita income and financial development proxy variables after accounting for unknown structural changes

Regressands	Barbados	Jamaica	Trinidad-Tobago
cspn	1.052 [0.00]*	1.342 [0.00]*	-2.932 [0.99]
D2001	-0.723[0.00]*		
D1969		-0.828 [0.01]*	29.996 [0.99]
F-Stats	2.529	1.275	0.040
Bounds	[[3.781, 5.031]]	[[10.007, 11.345]]	[[5.052, 5.797]]
W-Stats	5.058	2.551	0.081
Bounds	[[7.561, 10.063]]	[[10.007, 11.345]]	[[10.104, 11.593]]
N	42	48	51
ADL(j,k)	(1,1)	(1,0)	(1,1)
dcpn	4.883[0.00]*	0.963[0.00]*	-5.569[0.95]
D1986	-4.099[0.13]		
D2001		0.525[0.85]	
D2004			
F-Stats	1.327	1.049	10.140
Bounds	[[4.543, 5.538]]	[[3.733, 4.885]]	[[3.779, 4.882]]
W-Stats	2.654	2.097	20.280
Bounds	[[9.086, 11.077]]	[[7.467, 9.771]]	[[7.560, 9.764]]
N	39	48	14
ADL(j,k)	(1,0)	(1,0)	(1, 0)

Notes: J is the lag length of endogenous variables, and k is the lag length of exogenous variables. Absolute p-values are reported in square brackets, and bounds critical values are reported in double square brackets. *, ** and * denote significance at 0.01, 0.05 and 0.10 levels, respectively. See also Table 1.**

Continuation of Table 4:

llpn	3.911[0.00]*	0.946[0.92]	1.362[0.00]*
D1995	-3.196[0.05]**		
D1981		20.726[0.82]	
D1977			-1.460[0.12]
F-Stats	1.128	5.625	1.136
Bounds	[[4.121, 5.357]]	[[4.839, 5.610]]	[[4.702, 5.459]]
W-Stats	2.256	11.250	2.273
Bounds	[[8.242, 10.714]]	[[9.677, 11.219]]	[[9.403, 10.918]]
N	41	35	49
ADL(j,k)	(1,1)	(1,0)	(1,0)
mcapn	4.285[0.00]*	4.222[0.44]	1.397[0.00]*
D1997	1.266[0.96]		-1.947[0.00]*
D1985		-45.603[0.54]	
F-Stats	0.072	2.348	1.981
Bounds	[[4.692, 5.876]]	[[4.622, 5.510]]	[[4.410, 5.591]]
W-Stats	0.144	4.696	3.962
Bounds	[[9.384, 11.753]]	[[9.243, 11.020]]	[[8.820, 11.182]]
N	20	40	28
ADL(j,k)	(1,0)	(1, 0)	(1,0)

Continuation of Table 4:

mpn	1.038[0.00]*	1.240[0.00]*	1.363[0.00]*
D2001	-0.752[0.00]*		
D1969		-0.976[0.00]*	
D1977			-1.244[0.12]
F-Stats	4.684	8.553	1.255
Bounds	[[3.781, 5.031]]	[[5.003, 5.672]]	[[4.702, 5.459]]
W-Stats	9.367	17.105	2.510
Bounds	[[7.561, 10.063]]	[[10.007, 11.345]]	[[9.403, 10.918]]
N	42	48	49
ADL(j,k)	(1,0)	(1, 0)	(1,0)
qmpn	1.070[0.00]*	1.359[0.00]*	1.440[0.00]*
D1992	-0.752[0.00]*		
D1968		-1.251[0.00]*	
D1970			-1.377[0.06]***
F-Stats	1.691	9.211	1.086
Bounds	[[4.304, 5.428]]	[[5.049, 5.666]]	[[4.898, 5.577]]
W-Stats	3.383	18.421	2.172
Bounds	[[8.608, 10.857]]	[[10.098, 11.331]]	[[9.796, 11.154]]
N	42	48	49
ADL(j,k)	(1,0)	(1,1)	(1,0)

Table 5: Determination of level relationships between real per capita income and real per capita financial development proxies from ADL bounds testing relationships after accounting for structural changes

Model	Barbados	Jamaica	Trinidad-Tobago
(ypn, cpspn)	Level	Level	Level
(ypn, dcpn)	Level	Level	First difference
(ypn, llpn)	Level	First difference	Level
(ypn, mcapn)	Level	Level	Level
(ypn, mpn)	Error correction model	First difference	Level
(ypn, qmpn)	level	First difference	Level

Notes: These relationships are determined from the results in Table 3. See also Table 1.

Table 6: Temporal Granger causal relationship between real per capita economic growth (EG) and financial development proxies (FD) after accounting for unknown structural changes

Manipulated	Controlled	Exogenous	Information Criteria		Goodness of Fit Tests	Causal
Variables	Variables	Variables	AIC	SBC	χ^2_{Wald} test for H_0 : zero restrictions	Direction
Barbados						
ypn_{t-1}	cpspn_{t-1}	D2001	-2.160	-2.035	0.345[0.56]	FD \Rightarrow EG
ypn_{t-1}		D2001	-2.211	-2.130		
cpspn_{t-1}	ypn_{t-1}	D2001	-1.671	-1.547	2.021[0.16]	EG \Rightarrow FD
cpspn_{t-1}		D2001	-1.668	-1.585		
ypn_{t-1}	dcpn_{t-1}	D1986	-2.112	-1.984	0.134[0.71]	FD \Rightarrow EG
ypn_{t-1}		D1986	-2.183	-2.101		
dcpn_{t-1}	ypn_{t-1}	D1986	0.894	1.022	43.924*[0.00]	EG \Rightarrow FD
dcpn_{t-1}		D1986	1.640	1.725		
ypn_{t-1}	llpn_{t-1}	D1995	-2.224	-2.099	2.076[0.16]	FD \Rightarrow EG
ypn_{t-1}		D1995	-2.163	-2.082		
llpn_{t-1}	ypn_{t-1}	D1995	-1.968	-1.843	2.276[0.14]	EG \Rightarrow FD
llpn_{t-1}		D1995	-1.959	-1.875		
ypn_{t-1}	mcapn_{t-1}	D1997	-2.151	-2.002	0.069[0.80]	FD \Rightarrow EG
ypn_{t-1}		D1997	-2.166	-2.085		
mcapn_{t-1}	ypn_{t-1}	D1997	0.684	0.833	6.545**[0.02]	EG \Rightarrow FD
mcapn_{t-1}		D1997	0.909	1.009		

Continuation of Table 6:

Δy_{pn}_{t-1}	Δmpn_{t-1}	D2001	-2.281	-2.155	6.995[0.00]	FD EG
Δy_{pn}_{t-1}		D2001	-2.186	-2.104		
Δmpn_{t-1}	Δy_{pn}_{t-1}	D2001	-1.999	-1.874	0.551[0.46]	EG \Rightarrow FD
Δmpn_{t-1}		D2001	-2.034	-1.950		
$y_{pn}_{t-1} \Rightarrow$	$qmpn_{t-1}$	D1992	-2.138	-2.014	0.168[0.68]	FD \Rightarrow EG
y_{pn}_{t-1}		D1992	-2.171	-2.091		
$qmpn_{t-1}$	y_{pn}_{t-1}	D1992	-1.810	-1.686	3.563**[0.05]	EG \Rightarrow FD
$qmpn_{t-1}$		D1992	-1.770	-1.687		
Jamaica						
y_{pn}_{t-1}	$cpspn_{t-1}$	D1969	-2.888	-2.771	0.539[0.47]	FD \Rightarrow EG
y_{pn}_{t-1}		D1969	-2.994	-2.919		\Rightarrow
$cpspn_{t-1}$	y_{pn}_{t-1}	D1969	-0.648	-0.531	6.964*[0.01]	EG FD
$cpspn_{t-1}$		D1969	-0.545	-0.467		
y_{pn}_{t-1}	$dcpn_{t-1}$	D1971	-2.877	-2.760	0.021[0.88]	FD \Rightarrow EG
y_{pn}_{t-1}		D1971	-2.995	-2.921		\Rightarrow
$dcpn_{t-1}$	y_{pn}_{t-1}	D1971	-1.163	-1.046	10.670*[0.00]	EG FD
$dcpn_{t-1}$		D1971	-0.992	-0.914		
Δy_{pn}_{t-1}	$\Delta llpn_{t-1}$	D1981	-3.159	-3.041	0.237[0.63]	FD \Rightarrow EG
Δy_{pn}_{t-1}		D1981	-3.278	-3.203		
$\Delta llpn_{t-1}$	Δy_{pn}_{t-1}	D1981	-3.052	-2.918	1.121[0.29]	EG \Rightarrow FD
$\Delta llpn_{t-1}$		D1981	-1.877	-1.787		

Continuation of Table 6:

ypn_{t-1}	mcapn_{t-1}	D1985	-2.849	-2.722	0.108[0.74]	FD ⇌ EG
ypn_{t-1}		D1985	-2.998	-2.924		
mcapn_{t-1}	ypn_{t-1}	D1985	0.533	0.660	11.237*[0.00]	EG ⇒ FD
mcapn_{t-1}		D1985	0.749	0.833		
Δypn_{t-1}	Δmpn_{t-1}	D1969	-3.159	-3.041	2.164[0.14]	FD ⇌ EG
Δypn_{t-1}		D1969	-3.249	-3.174		
Δmpn_{t-1}	Δypn_{t-1}	D1969	-1.410	-1.292	0.237[0.63]	EG ⇌ FD
Δmpn_{t-1}		D1969	-1.447	-1.368		
Δypn_{t-1}	Δqmpn_{t-1}	D1968	-3.160	-3.043	0.360[0.55]	FD ⇌ EG
Δypn_{t-1}		D1968	-3.249	-3.174		
Δqmpn_{t-1}	Δypn_{t-1}	D1968	-1.399	-1.281	2.202[0.14]	EG ⇌ FD
Δqmpn_{t-1}		D1968	-1.434	-1.355		
Trinidad-Tobago						
ypn_{t-1}	cpspn_{t-1}	D1969	-1.564	-1.451	1.782[0.19]	FD ⇌ EG
ypn_{t-1}		D1969	-1.585	-1.510		
cpspn_{t-1}	ypn_{t-1}	D1969	-2.012	-1.899	29.476*[0.00]	EG ⇒ FD
cpspn_{t-1}		D1969	-1.573	-1.497		
Δypn_{t-1}	Δdcpn_{t-1}	D2004	-1.515	-1.389	0.680[0.19]	FD ⇌ EG
Δypn_{t-1}		D2004	-1.615	-1.540		
Δdcpn_{t-1}	Δypn_{t-1}	D2004	3.572	3.699	37.609[0.00]	EG ⇒ FD
Δdcpn_{t-1}		D2004	4.224	4.308		
ypn_{t-1}	llpn_{t-1}	D1977	-1.387	-1.263	0.034[0.85]	FD ⇌ EG
ypn_{t-1}		D1977	-1.616	-1.542		⇒
llpn_{t-1}	ypn_{t-1}	D1977	-1.525	-1.409	7.266*[0.00]	EG ⇌ FD
llpn_{t-1}		D1977	-2.172	-2.095		

Continuation of Table 6:

ypn_{t-1}	mcapn_{t-1}	D1997	-1.265	-1.123	0.732[0.40]	FD ⇒ EG
ypn_{t-1}		D1997	-1.591	-1.517		
mcapn_{t-1}	ypn_{t-1}	D1997	0.337	0.479	13.302[0.00]*	EG ⇒ FD
mcapn_{t-1}		D1997	0.692	0.787		
ypn_{t-1}	mpn_{t-1}	D1977	-1.530	-1.414	0.261[0.61]	FD ⇏ EG
ypn_{t-1}		D1977	-1.616	-1.542		
mpn_{t-1}	ypn_{t-1}	D1977	-2.079	-1.963	3.820*[0.05]	EG ⇒ FD
mpn_{t-1}		D1977	-2.039	-1.962		
ypn_{t-1}	qmpn_{t-1}	D1970	-1.541	-1.425	2.176[0.14]	FD ⇏ EG
ypn_{t-1}		D1970	-1.585	-1.510		
qmpn_{t-1}	ypn_{t-1}	D1970	-2.269	-2.153	18.225*[0.00]	EG ⇒ FD
qmpn_{t-1}		D1970	-1.892	-1.815		

Notes: P-values are reported in square brackets; *, ** and *** denote significance at 0.01, 0.05 and 0.10 levels, respectively. Notation \Rightarrow denotes Granger causality, and \nRightarrow denotes non Granger causality. Thus, $EG \Rightarrow FD$ means EG Granger causes FD, and $FD \nRightarrow EG$ means FD does not Granger causes EG, where EG is economic growth and FD is financial development.

Table 7: Long-run weak exogeneity tests after accounting for an unknown exogenous structural change

Manipulated Variables	Controlled Variables	Exogenous Variables	EC Terms	Causal Direction
Barbados				
cpspn	ypn	D2001	-0.245[2.158]	EG ⇒ FD
ypn	cpspn	D2001	0.001[0.016]	FD ⇏ EG
dcpn	ypn	D1986	-1.453[5.293]	EG ⇏ FD
ypn	dcpn	D1986	-0.055[1.003]	FD ⇏ EG
llpn	ypn	D1995	0.017[0.495]	EG ⇏ FD
ypn	llpn	D1995	-0.256[3.371]	FD ⇒ EG
mcapn	ypn	D1997	-0.105[0.460]	EG ⇏ FD
ypn	mcapn	D1997	-0.609[3.395]	FD ⇒ EG
mpn	ypn	D2001	-0.054[0.643]	EG ⇏ FD
ypn	mpn	D2001	-0.287[2.654]	FD ⇒ EG
qmpn	ypn	D1992	-0.160[1.460]	EG ⇏ FD
ypn	qmpn	D1992	-0.367[2.690]	FD ⇒ EG

Notes: T-ratios are reported in square brackets. Causal direction is denoted by , and ⇏ denotes no causation. Thus EG ⇒ FD means EG causes FD, where EG is economic growth and FD is financial development, and FD ⇏ EG means FD does not cause EG. *, ** and * denote significance at 0.01, 0.05 and 0.10 levels, respectively.**

Continuation from Table 7:

Jamaica				
Cpspn	ypn	D1969	-0.546[3.927]*	EG \Rightarrow FD
Ypn	cpspn	D1969	0.010[0.450]	FD \nRightarrow EG
Dcpn	ypn	D1971	-0.107[2.082]	EG \Rightarrow FD
Ypn	dcpn	D1971	-0.018[0.689]	FD \nRightarrow EG
Llpn	ypn	D1981	-0.478[2.830]	EG \Rightarrow FD
Ypn	llpn	D1981	-0.062[0.797]	FD \nRightarrow EG
mcapn	ypn	D1985	0.083[2.640]	EG \Rightarrow FD
Ypn	mcapn	D1985	-0.114[1.933]	FD \nRightarrow EG
Mpn	ypn	D1969	-0.142[1.509]	EG \nRightarrow FD
Ypn	mpn	D1969	-0.043[1.656]	FD \nRightarrow EG
Qmpn	ypn	D1968	-0.150[1.967]	EG \Rightarrow FD
Ypn	qmpn	D1968	-0.035[1.267]	FD \nRightarrow EG
Trinidad-Tobago				
Cpspn	ypn	D1969	-0.225[4.234]	EG \Rightarrow FD
Ypn	cpspn	D1969	-0.005[0.068]	FD \nRightarrow EG
Dcpn	ypn	D2004	-0.734[2.862]	EG \Rightarrow FD
Ypn	dcpn	D2004	-0.330[3.082]	FD \Rightarrow EG
Llpn	ypn	D1977	-0.062[1.701]	EG \nRightarrow FD
Ypn	llpn	D1977	-0.181[1.993]	FD \Rightarrow EG
mcapn	ypn	D1997	-0.288[1.265]	EG \nRightarrow FD
Ypn	mcapn	D1997	-0.350[3.006]	FD \Rightarrow EG
Mpn	ypn	D1977	-0.076[1.726]	EG \nRightarrow FD
Ypn	mpn	D1977	-0.200[2.105]	FD \Rightarrow EG
Qmpn	ypn	D1970	-0.173[2.815]	EG \Rightarrow FD
Ypn	qmpn	D1970	-0.046[0.518]	FD \nRightarrow EG

Conclusion

- (1) Policymakers are advised in the near term to direct national resources to develop the economy and promote economic growth, and to serve as a facilitator of the financial market by embarking on policies to deepen the stock market and widen the participation of the general public in all three Caribbean countries with emphasis on Trinidad-Tobago. Similar policies are recommended in the long-run for Jamaica.**

- (2) Considering that financial development is a handmaiden to economic growth in the country, the government must employ national resources and tax revenues of the country to produce the following growth inducement activities:**
 - (i) improve the level of education and skills of the labour force**
 - (ii) improve the quality of infrastructure in the country**
 - (iii) support and encourage cultural attitudes that nurture and encourage entrepreneurship**
 - (iv) develop institutions to protect and enforce property rights and contractual agreement**
 - (v) adopt workable, efficient and effective justice system, rules and regulations to curb corruption in the nation**
 - (vi) hire not only well-educated and qualified persons but to also ensure that those they hire have integrity and probity**

Social implications:

Policymakers are advised to make the overall economic growth of Jamaica their policy priority, and not favour their financial and stock market with special incentive policies over both near term and long-run.

Similar short-term policy is strongly recommended for Trinidad-Tobago, and loosely recommended for Barbados, although incentives in the latter's banking sector will enhance economics growth.

However, mixed Granger causality test results in Barbados and Trinidad-Tobago suggest that extending resources as incentives to boost up both financial market development and economic growth will benefit them over the long-run.



THANK YOU