

***"FINANCIAL SECTOR DEVELOPMENT AND ECONOMIC
GROWTH NEXUS: AN EMPIRICAL ANALYSIS OF
PACIFIC MELEANSIAN COUNTRIES"***

2017 PNG UPDATE

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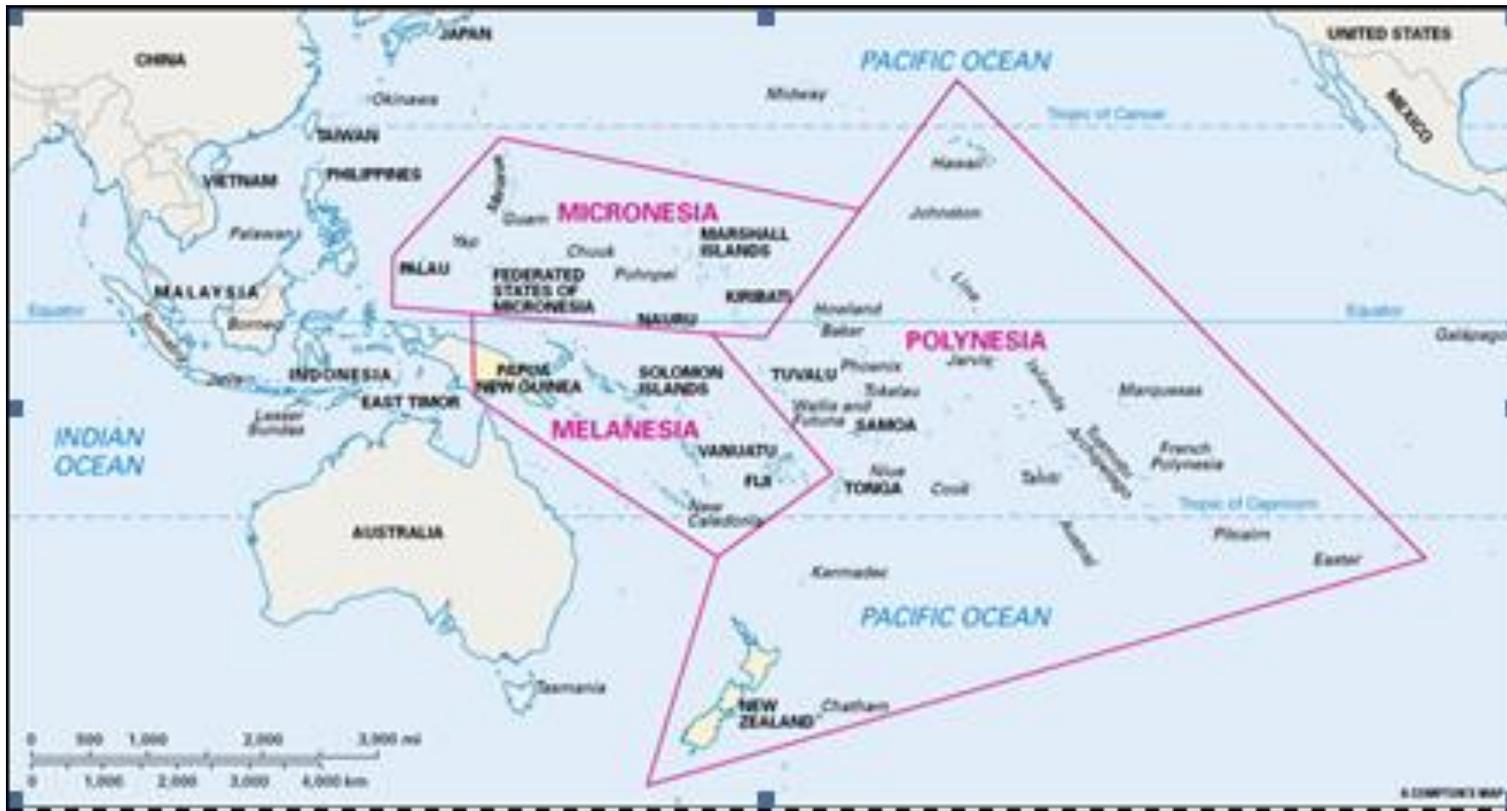
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Introduction & Outline of Study

- ➡ **Origin of research**
- ➡ **Research questions and hypothesis**
- ➡ **Aims of the research**
- ➡ **Rationale for conducting the research**
- ➡ **Data and research methodology**
- ➡ **Conceptual model**

Origin of research

- Pacific Melanesian countries comprising PNG, Solomon islands, Fiji and Vanuatu are part of the East Asia Pacific (EAP) region, but the growth rates of MSG as a group are significantly different to that of the EAP countries



Origin of research continue...

- **The fundamental question in growth literature is:**

Why different economies grow at different rates?

- **Literature purports many possible factors (e.g. international trade, factor accumulation) responsible for economic growth and the list of factors continue to expand**
- **The role of the financial sector in the growth process has begun to receive considerable attention since the benchmark empirical work of King & Levine (1993) in the 1990s when financial intermediation was first incorporated into the endogenous growth models (EGM) as a potential growth inducing factor (Blackburn & Hung, 1998).**
- **Findings also remain inconclusive and vary across countries/regions on the link between finance and growth.**
- **This implies that both theoretical and empirical work in this area of research is still very much in progress**

Origin of research continues...

- **Melanesian countries (*as an homogenous entity*) experienced massive political and socio-economic changes in the last 30 years (i.e. 1976 to 2010)**
- **In the absence of major economic and financial reforms, minor market oriented financial sector reforms were introduced (e.g. Fiji quantitative restrictions and PNG financial sector reforms)**
- **International financial institutions (e.g. IMF and WB) backed the restructuring programs (e.g. SASP in PNG)**
- **Events such as Oil price shocks in the 1980s and 1997/1998 Global Financial Crisis (GFC)**

Origin of research continues...

- **The financial and socio-economic developments that transpired both internally (such as minor reforms) and externally (such as the GFC) in the period examined may have impacted:**

(1) the MSG countries' financial sector performances and real economic growth rates; and (2) the overall financial performance may in turn have induced real economic growth performance, or vice versa.

- **No attempt has been made to date (to the best of the author's knowledge) to systematically investigate the impact of all these changes on the financial sector and real economic growth**

This study intends to fill the gap in knowledge for the MSG economies.

Research questions and hypothesis

Fundamental research question (RQ) and the corresponding testable hypothesis (H0):

- ***RQ 1: To what extent did financial sector development (as proxied by FSD, LLY, PC and DCP) induce economic growth (as measured by the change in real per capita GDP) in the MSG countries over the period 1976-2010? Or vice versa?***

H0: Financial sector development (as measured by FSD, LLY, PC and DCP) may have induced the economic growth process (as measured by the change in real per capita GDP) in MSG countries over the period 1976-2010; or vice versa

Aims of the research

- (1) To investigate the extent of the contributions of the financial system on economic growth; or vice versa**
- (2) To determine the factors that may have caused changes in the financial sector and the real economy**
- (4) To support evidence-based policy formulation, resource allocation prioritisation and institute institutional reforms as this would promote inclusive financial development and sustainable economic growth**
- (5) To provide a platform for further research**

Rationale for conducting the research

- (1) There is no similar study in the reported literature**
- (2) A better understanding of the potential factors that influence FD and economic growth could provide knowledge and new insights to guide future evidence based economic policy formulation (Levine, 2003).**
- (3) Insights from this study may stimulate further research capacity**
- (4) This study would in general contribute to the growing body of knowledge on financial development and economic growth relationship**
- (5) Financial literacy and curriculum development may be promoted because issues such as: financial education; financial inclusion; and consumer protection to support the growth of a well-diversified financial sector and inclusive economic growth remain critical development challenges.**

Given the significance of this study's potential contributions, this country-region specific empirical study is not only necessary but warranted

Data

- ➡ **The lack of consistent and quality empirical data is a significant barrier to evidence-based policy formulation**
- ➡ **This study relied on three main external reliable database providers: United Nation Data (UNData); World Bank; and International Monetary Fund (IMF)**
- ➡ **Based on the assembled annual time series datasets two different properties of the data were derived: panel and time series datasets.**
- ➡ **Estimates would be robust as there are no gaps in data series.**

Brief Literature review and research gap

- **Although prior studies, starting with Patrick (1966) produce empirical evidence that the rate of FD correlates with economic growth, results on the causal relationship between finance and growth, particularly for developing countries remain largely mixed in both theory and empirics (e.g. Abu-Bader & Abu-Qarn, 2008)**

Levine's works and the extant literature establish areas for further research (Levine & Zervos (1998):

- **...“researchers should attempt to build models of and develop data on the links between growth and the different components of the financial system: banks (private and public), nonbanks (mutual funds, private pension funds, insurance companies, and others), stock markets, bond markets, and derivatives markets” (p.335).**

Summary of literature review

Major views ²	Alternative names	Main early proponents	Definition
<i>Supply-leading view</i>	<ul style="list-style-type: none"> ▪ finance-led ▪ supply-following ▪ one-way causality 	Hamilton (1781); Bagehot (1873); Schumpeter (1912); Goldsmith (1969); McKinnon (1973); Shaw (1973)	The proposition that FD has a positive effect on economic growth. Or economic growth follows financial development.
<i>Demand-leading view</i>	<ul style="list-style-type: none"> ▪ demand-following ▪ industry-led ▪ enterprise-led ▪ growth-led ▪ one way causality 	Robinson (1952); Patrick, (1966)	The proposition that economic growth has a positive effect on FD. Or FD follows economic growth.
<i>Mutual causality view</i>	<ul style="list-style-type: none"> ▪ bi-directional causality ▪ bi-directionality ▪ two-way causality ▪ jointly determined ▪ feedback effect ▪ mutual linkage 	Demetriades & Hussein (1996); Greenwood & Smith (1997)	The view that financial development and economic growth are mutually causal. Or there is a two way causal effect between finance and growth.
<i>No causation view</i>	<ul style="list-style-type: none"> ▪ no causality ▪ no cause and effect ▪ neutrality ▪ independent hypothesis 	Lucas (1988); Mazur & Alexander (2001); Development economists such as Gerald Meir	The view that FD and economic growth are not causally related or there is neutrality between finance and growth.
<i>Negative view</i>	<ul style="list-style-type: none"> ▪ Impediment view 	Ram (1999)	The view that FD is an impediment to economic growth or vice versa. Or financial development and economic growth are negatively correlated.

Notes:

- (1) Table 2.1 was developed based on the extant literature.
- (2) In the literature, the word view is also used interchangeably with words such as proposition, belief, thesis, hypothesis, phenomenon, argument and response.

Variables, Measurement and Expected signs

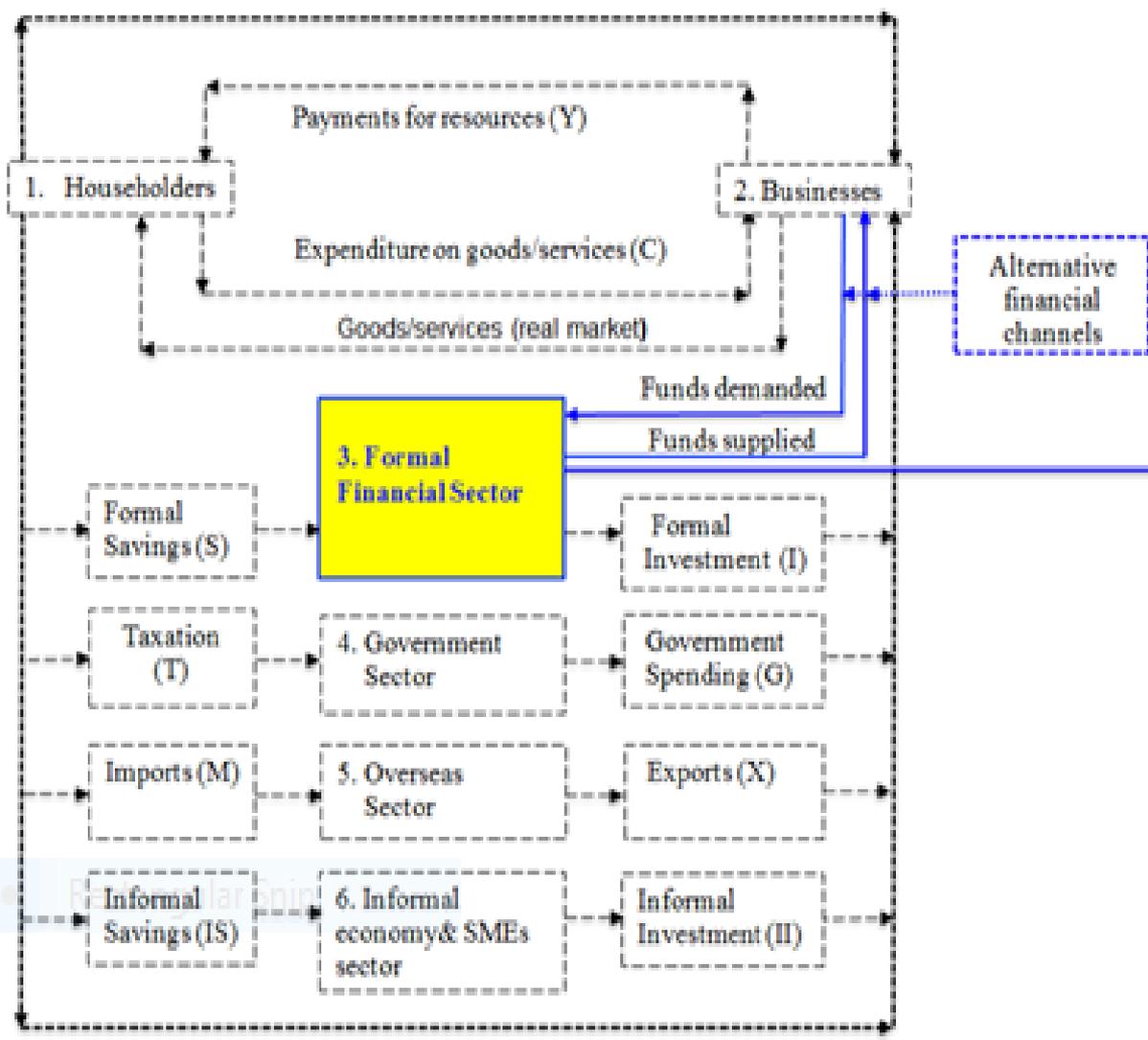
Table 1: Data sources, measurement and expected signs of variables

Variable and (codes) ^a	Source of data	Measurement	Expected signs ^b
<i>(i) Economic growth proxy</i>			
^d Real per capita GDP (<i>ln</i> *RGDPC)	UNDATA	Ratio of real GDP to total population.	Positive (+)
<i>(ii) Financial proxies</i>			
Financial System Deposits (<i>FSD</i>)	World Bank	Ratio of demand, time and saving deposits by banks and NBFIs to GDP.	Positive (+)
Liquid Liabilities (<i>LL</i>)	World Bank	Ratio of liquid liabilities of the financial system to GDP.	Positive (+)
Domestic Credit (<i>DCP</i>)	World Bank	Ratio of domestic credit to private sector credit to GDP.	Positive (+)
Private Credit (<i>PC</i>)	World Bank	Ratio of private credit by banks and other financial institutions to GDP.	Positive (+)
<i>(iii) Set of control variables</i>			
<i>Explanatory variables</i>			
Government spending (<i>GOV</i>)	World Bank	Ratio of government consumption expenditure to GDP.	Negative (-)
Gross Capital Formation (<i>lnGCAP</i>)	World Bank, IMF	Ratio of gross capital formation (investment) to GDP.	Positive (+)
Trade (<i>TRAD</i>)	World Bank	Ratio of the sum of exports and imports to GDP.	Positive (+)
Inflation (<i>INF</i>) ^f	World Bank	Inflation rate (difference of consumer price index (CPI)).	Negative (-)
Life expectancy (<i>LE</i>)	World Bank	Life expectancy at birth in years as a proxy for human capital development.	Positive (+)
Infant Mortality Rate (<i>IMR</i>)	World Bank	Infant mortality rate per 1000 live births as a proxy for population growth rate.	Negative (-)
Foreign Direct Investment (<i>FDI</i>)	World Bank, IMF	Foreign direct investment (FDI), net inflows to GDP.	Positive (+)
Aid Assistance (<i>AID</i>)	World Bank ^g	Net development assistance and official foreign aid received (constant 2010 US\$).	Negative (-)
<i>D1</i> (<i>AFC</i>)	Dummy variable	To capture the effects of the 1997/1999 Asian Financial Crisis (AFC).	Negative (-)
<i>D2</i> (<i>GFC</i>)	Dummy variable	To capture the effects of the 2007/2010 Global Financial Crisis (GFC).	Negative (-)

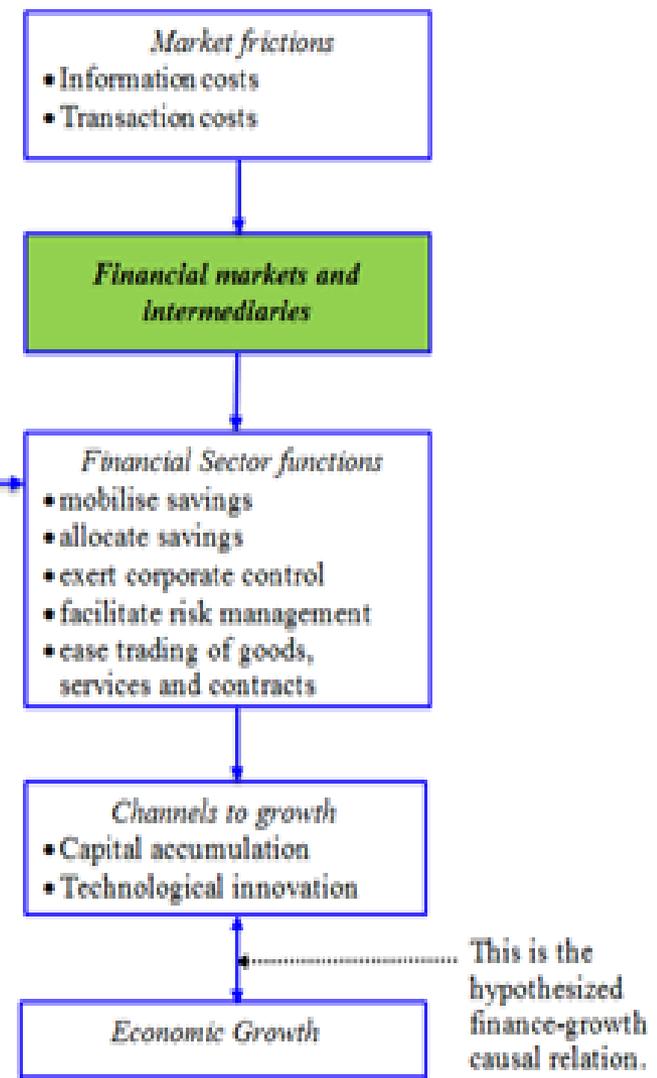
Notes: (a) Variable codes in (parentheses) are italicized throughout; (b) the expected effects between the dependent variable and the explanatory variables; (c) the variables are partitioned into three parts: (i) economic growth indicator; (ii) financial proxies; and (iii) eight explanatory variables plus *D1* and *D2* which take on the values of 1 for effects otherwise zero; (d) Real GDP at 2010 constant prices in billions of US dollars (USD); (e) variables with the *ln* prefix are log transformed; (f) with the exception of *INF* which is an index and the two dummy variables, all the other variables are ratios and hence are not in any unit of measurement; and (g) the World Bank data were drawn from Beck, (2010).

Conceptual framework

Panel A: Structural layout of a typical dual economy

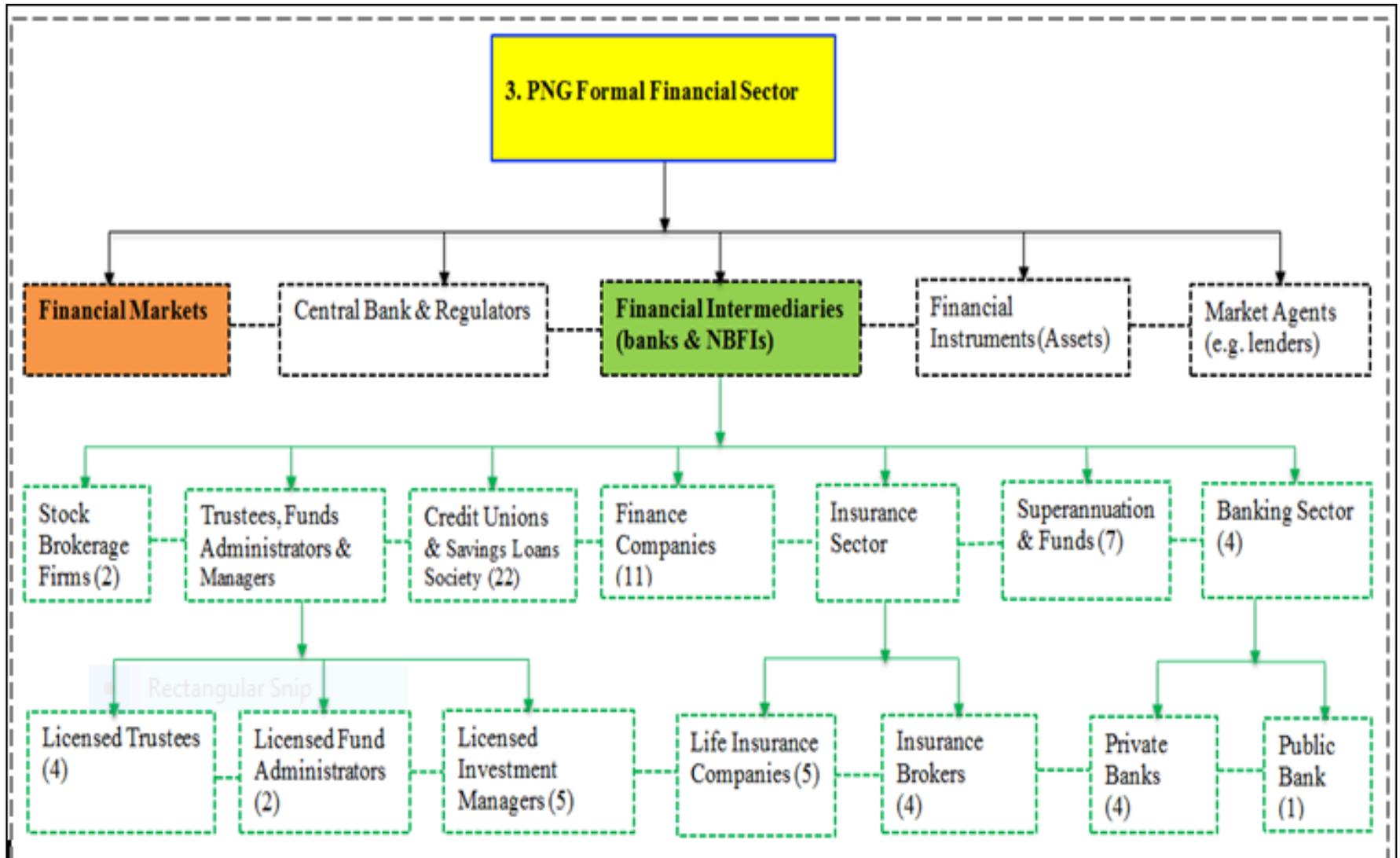


Panel B: A theoretical approach to finance and growth link



Source: Panel A developed by the Author by modifying the circular flow of income model and Panel B adapted from Levine (1997, p.691).

Financial sector structural framework



Source: Developed by the Author in line with the financial sector structural definition this study adopts with information obtained from BPNG (<http://www.bankpng.gov.pg>).

Relevant theories

- ➡ **Economic growth theories in particular the Endogenous growth theory; and**
- ➡ **Financial intermediary theories**

Theoretical framework and methodology

- The theoretical neoclassical framework is represented by the **Mankiw-Romer-Weil (1992) (henceforth MRW) theoretical framework** in the following three factor input Cobb-Douglas long-run equilibrium aggregate production function:

$$Y_t = F(K_t, H_t, A_t L_t) \quad t \in \{1, 2, \dots, T\}$$

- where actual output at time t is a function of: physical capital stock (K_t); human capital (H_t); technological change or total factor productivity (A_t); and labour (L_t). The number of effective units of labour is represented by $A_t L_t$. The parameters α (output elasticity between the output and physical capital) and β (output elasticity between the output and human capital) are estimated from empirical data.

Theoretical framework and methodology continues...

- Thus, in accord with the expectations of contemporary endogenous growth theory and empirics where FIs are explicitly modeled, the functional relationship between financial intermediation and growth can be represented by the following estimable econometric model:

$$\ln Y_t = \alpha_0 + \Phi \ln K_t + \theta \ln H_t + \gamma \ln L_t + \varphi FD_t + \sigma \ln X_t + \epsilon_t$$

- where FD_t represents the four sets of financial proxies (FSD , LL , DCP and PC); $\sigma \ln X_t$ represents the vectors of explanatory factors which vary across researchers and studies; L and H for labour and human capital, respectively; Φ , θ , γ and σ are parameters of interest to be estimated; α represents the constant; and ϵ_t is an error term
- The above random effects (REs) model is incorporated into the general-to-specific modelling procedure for estimation purposes.

Panel unit root tests & data diagnostic tests

- ➡ Panel unit tests were done using the IPS unit root procedure
- ➡ All the series included in the estimations are $I(1)$ or stationary which led to robust estimations
- ➡ Diagnostic tests on panel data were also implemented and statistical complications of heteroskedasticity; panel autocorrelation; and contemporaneous correlation were corrected
- ➡ To determine whether the models are specified correctly or not the Ramsey RESET test was effected

Results of panel regression

Dependent variable: $\Delta \ln \text{RGDP}_{i,t}$ (real per capita GDP), first difference

Variables of interest	Model 1: FSD as proxy		Model 2: LL as proxy		Model 3: DCP as proxy		Model 4: PC as proxy	
	Coef. (t-stats)	S.E	Coef. (t-stats)	S.E	Coef. (t-stats)	S.E	Coef. (t-stats)	S.E
$\Delta \ln \text{RGDP}_{i,t}$	0.2160*** (2.36) ^f	0.091	0.2148** (2.35)	0.092	0.2114** (2.27)	0.093	0.2143** (2.25)	0.095
$\Delta \text{financial proxy}_{i,t}^d$	0.1432** (1.97)	0.073	0.1422** (1.97)	0.072	-0.0004 (-0.27)	0.002	0.0219 (0.11)	0.204
$\Delta \text{GOV}_{i,t}$	-0.0028 (-1.28)	0.002	-0.0028 (-1.30)	0.002	-0.0019 (-0.86)	0.002	-0.0021 (-0.94)	0.002
$\Delta \ln \text{GCAP}_{i,t}$	-0.0192 (-0.73)	0.03	-0.0193 (-0.74)	0.026	-0.0125 (-0.48)	0.026	-0.0122 (-0.47)	0.026
$\Delta \ln \text{GCAP}_{i,t-2}$	0.0474* (1.84)	0.03	0.0479* (1.86)	0.026	0.0488 (1.87)	0.026	0.04960* (1.86)	0.027
$\Delta \text{TRAD}_{i,t}$	0.0020*** (3.24)	0.001	0.0020*** (3.26)	0.001	0.0020*** (3.13)	0.001	0.0020*** (3.13)	0.001
$\Delta \text{INF}_{i,t}$	-0.0016 (-1.50)	0.001	-0.0016 (-1.53)	0.001	-0.0017 (-1.56)	0.001	-0.0016 (-1.53)	0.001
$\Delta \text{LE}_{i,t}$	-0.0163 (-0.92)	0.018	-0.0167 (-0.94)	0.018	-0.0161 (-0.90)	0.018	-0.0163 (-0.91)	0.018
$\Delta \text{IMR}_{i,t}$	0.0058 (0.61)	0.010	0.0059 (0.62)	0.010	0.0039 (0.41)	0.010	0.0039 (0.41)	0.010
D1 (AFC)	-0.0170 (-0.97)	0.017	-0.0170 (-1.00)	0.018	-0.0167 (-0.95)	0.018	-0.0158 (-0.89)	0.018
D2 (GFC)	-0.0084 (-0.60)	0.014	-0.0086 (-0.62)	0.014	0.0038 (0.27)	0.014	0.0014 (0.09)	0.016
Cons	0.0240* (1.84)	0.013	0.0245* (1.88)	0.013	0.0238 (1.82)	0.013	0.0232* (1.76)	0.013
Wald ch2 (11)	32.11		32.07		30.01		29.61	
Prob>chi Sq.	0.000		0.000		0.0016		0.001	
R ²	0.2378		0.2386		0.2279		0.2254	
Rho (Pp)	-0.0463		-0.0463		-0.0657		-0.0608	

Notes: (a) Coef. for Coefficients, t-stats for test statistics, and S.E for heteroskedasticity corrected Standard Error using PCSEs; (b) ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively; (c) Parenthesis contain t-statistics, and (d) $\Delta \text{FSD}_{i,t}$ is represented by $\Delta \text{financial proxy}_{i,t}$ when FSD is the financial proxy in Model 1; $\Delta \text{LL}_{i,t}$ is represented by $\Delta \text{financial proxy}_{i,t}$ when LL is the financial proxy in Model 2; $\Delta \text{DCP}_{i,t}$ is represented by $\Delta \text{financial proxy}_{i,t}$ when DCP is the financial proxy in Model 3; and $\Delta \text{PC}_{i,t}$ is represented by $\Delta \text{financial proxy}_{i,t}$ when PC is the financial proxy in Model 4, respectively.

Key findings

- The main finding suggests that FD (via the financial proxies of *FSD* and *LL*) had a positive significant influence on economic growth in the MSG economies over the last three decades.
- This finding is consistent with a substantial body of literature that generally supports the *finance-leading growth hypothesis*
- In addition, the empirical results reveal that economic growth in the past period had a positively significant influence on the subsequent (current) period's growth on a more consistent basis
- Financial crisis didn't affect economic growth
- Because other variables (e.g. trade, investment) also played a significant role in explaining economic growth, it seems that a well-functioning financial sector is a necessary, but not a sufficient condition to reach steady economic growth in the MSG countries

Policy Implications

(1) Primary Policy Issues : Spur the growth of the parts of the financial system: Banks, NBFIs, Financial Markets

- (a) Simulation of credit market activity**
- (b) Reforms to make banking sector more competitive**
- (c) Educational programs, financial literacy and human capital development**
- (d) Enhancing the development of financial infrastructure**
- (e) *Policies targeted at remedying growth constraints in the informal sector***
- (f) *Development of the NBFIs sector***
- (g) *Adoption of innovative technological practices in the financial sector***
- (h) *Regulatory framework to nurture the growth of modern banking sector***
- (i) *Development of the domestic capital market***
- (j) *Financial deregulation and minimal government intervention***

Policy Implications continue...

(2) Secondary Policy Issues

- (a) Strengthen the processes and systems associated with data generation***
- (b) Improve ways to facilitate efficient transfer of remittances & FDI***
- (c) Financial and economic integration to facilitate trade and investment***
- (d) Prediction of future values***

Contributions to the literature

- (1) Contributes to the literature on finance growth nexus**
- (2) The conventional capitalist-based five-sector circular flow income model, which ignores the informal sector, was modified to produce a unique six-sector model by including the informal economy.**

Limitations of the research

(1) Data

(2) Omission of other variables and sectors

(3) Methodological shortcomings

(4) Lack of prior studies to corroborate findings

Suggestions for future research

- (1) Channels of financial intermediation**
- (2) Country-specific studies to confirm or refute the current findings**
- (3) Relationship of the informal sector to the formal financial sector**
- (4) The effects of technology adoption on financial intermediation**
- (5) Forecasting and replication of study**

THANK YOU !!!

