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

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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.
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.
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)
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
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.
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

<table>
<thead>
<tr>
<th>Major views</th>
<th>Alternative names</th>
<th>Main early proponents</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply-leading</strong></td>
<td>finance-led</td>
<td>Hamilton (1781); Bagehot (1873); Schumpeter (1912); Goldsmith (1969); McKinnon (1973); Shaw (1973)</td>
<td>The proposition that FD has a positive effect on economic growth. Or economic growth follows financial development.</td>
</tr>
<tr>
<td>view</td>
<td>supply-following</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>one-way causality</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Demand-leading</strong></td>
<td>demand-following</td>
<td>Robinson (1952); Patrick, (1966)</td>
<td>The proposition that economic growth has a positive effect on FD. Or FD follows economic growth.</td>
</tr>
<tr>
<td>view</td>
<td>industry-led</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>enterprise-led</td>
<td></td>
<td></td>
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<td></td>
<td>growth-led</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>one-way causality</td>
<td></td>
<td></td>
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<tr>
<td><strong>Mutual causality</strong></td>
<td>bi-directional causality</td>
<td>Demetriades, &amp; Hussein (1996); Greenwood &amp; Smith (1997)</td>
<td>The view that financial development and economic growth are mutually causal. Or there is a two way causal effect between finance and growth.</td>
</tr>
<tr>
<td>view</td>
<td>bi-directionality</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>two-way causality</td>
<td></td>
<td></td>
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<td></td>
<td>jointly determined</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>feedback effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mutual linkage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No causation</strong></td>
<td>no causality</td>
<td>Lucas (1988); Mazur &amp; Alexander (2001); Development economists such as Gerald Meir</td>
<td>The view that FD and economic growth are not causally related or there is neutrality between finance and growth.</td>
</tr>
<tr>
<td>view</td>
<td>no cause and effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>neutrality</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>independent hypothesis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative view</strong></td>
<td>Impediment view</td>
<td>Ram (1999)</td>
<td>The view that FD is an impediment to economic growth or vice versa. Or financial development and economic growth are negatively correlated.</td>
</tr>
</tbody>
</table>

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

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

**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

1. Householders
   - Payments for resources (Y)
   - Expenditure on goods/services (C)
   - Goods/services (real market)

2. Businesses
   - Funds demanded
   - Funds supplied

3. Formal Financial Sector
   - Formal Savings (S)
   - Taxation (T)
   - Imports (M)
   - Informal Savings (IS)

4. Government Sector
   - Government Spending (G)

5. Overseas Sector
   - Exports (X)

6. Informal economy & SMEs sector
   - Informal Investment (II)

Panel B: A theoretical approach to finance and growth link

Market frictions
- Information costs
- Transaction costs

Financial markets and intermediaries

Financial Sector functions
- Mobilise savings
- Allocate savings
- Exert corporate control
- Facilitate risk management
- Ease trading of goods, services and contracts

Channels to growth
- Capital accumulation
- Technological innovation

Economic Growth

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

3. PNG Formal Financial Sector

Financial Markets
- Stock Brokerage Firms (2)
- Trustees, Funds Administrators & Managers

Central Bank & Regulators
- Credit Unions & Savings Loans Society (22)

Financial Intermediaries (banks & NBFIs)
- Finance Companies (11)
- Life Insurance Companies (5)
- Insurance Brokers (4)

Financial Instruments (Assets)
- Insurance Sector
- Superannuation & Funds (7)

Market Agents (e.g. lenders)
- Banking Sector (4)
- Private Banks (4)
- Public Bank (1)

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).
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:

\[ Y_t = F(K_t, H_t, A_tL_t) \quad t \in \{1, 2, \ldots, T\} \]

- 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 \( A_tL_t \). The parameters \( \alpha \) (output elasticity between the output and physical capital) and \( \beta \) (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; \( \Phi, \theta, \gamma \) and \( \sigma \) are parameters of interest to be estimated; \( \alpha \) represents the constant; and \( \epsilon_t \) 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:** ΔlnRGDPc\(_t\) (real per capita GDP), first difference

<table>
<thead>
<tr>
<th>Variables of interest</th>
<th>Model 1: FSD as proxy</th>
<th>Model 2: LL as proxy</th>
<th>Model 3: DCP as proxy</th>
<th>Model 4: PC as proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef (t-stats)</td>
<td>S.E</td>
<td>Coef (t-stats)</td>
<td>S.E</td>
</tr>
<tr>
<td>ΔlnRGDPc(_{t-1})</td>
<td>0.2160*** (2.36)*</td>
<td>0.091</td>
<td>0.2148** (2.35)</td>
<td>0.092</td>
</tr>
<tr>
<td>Δfinancial proxy(_{t-1})</td>
<td>0.1432** (1.97)</td>
<td>0.073</td>
<td>0.1422** (1.97)</td>
<td>0.072</td>
</tr>
<tr>
<td>ΔGOV(_{t-1})</td>
<td>-0.0028 (-1.28)</td>
<td>0.002</td>
<td>-0.0028 (-1.30)</td>
<td>0.002</td>
</tr>
<tr>
<td>ΔlnGCAP(_{t-1})</td>
<td>-0.0192 (-0.73)</td>
<td>0.03</td>
<td>-0.0193 (-0.74)</td>
<td>0.026</td>
</tr>
<tr>
<td>ΔlnGCAP(_{t-2})</td>
<td>0.0474* (1.84)</td>
<td>0.03</td>
<td>0.0479* (1.86)</td>
<td>0.026</td>
</tr>
<tr>
<td>ΔTRAD(_{t-1})</td>
<td>0.0020*** (3.24)</td>
<td>0.001</td>
<td>0.0020*** (3.13)</td>
<td>0.001</td>
</tr>
<tr>
<td>ΔINF(_{t-1})</td>
<td>-0.0016 (-1.50)</td>
<td>0.001</td>
<td>-0.0016 (-1.53)</td>
<td>0.001</td>
</tr>
<tr>
<td>ΔLE(_{t-1})</td>
<td>-0.0163 (-0.92)</td>
<td>0.018</td>
<td>-0.0167 (-0.94)</td>
<td>0.018</td>
</tr>
<tr>
<td>ΔMR(_{t-1})</td>
<td>0.0058 (0.61)</td>
<td>0.010</td>
<td>0.0059 (0.62)</td>
<td>0.010</td>
</tr>
<tr>
<td>D1 (AFC)</td>
<td>-0.0170 (-0.97)</td>
<td>0.017</td>
<td>-0.0170 (-1.00)</td>
<td>0.018</td>
</tr>
<tr>
<td>D2 (GFC)</td>
<td>-0.0084 (-0.60)</td>
<td>0.014</td>
<td>-0.0086 (-0.62)</td>
<td>0.014</td>
</tr>
<tr>
<td>Cons</td>
<td>0.0240* (1.84)</td>
<td>0.013</td>
<td>0.0245* (1.88)</td>
<td>0.013</td>
</tr>
<tr>
<td>Wald chi2 (11)</td>
<td>32.11</td>
<td>32.07</td>
<td>30.01</td>
<td>29.61</td>
</tr>
<tr>
<td>Prob&gt;chi Sq.</td>
<td>0.000</td>
<td></td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.2378</td>
<td>0.2386</td>
<td>0.2279</td>
<td>0.2254</td>
</tr>
<tr>
<td>Rho (Pp)</td>
<td>-0.0463</td>
<td></td>
<td>-0.0657</td>
<td></td>
</tr>
</tbody>
</table>

**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) ΔFSD\(_{t-1}\) is represented by Δfinancial proxy\(_{t-1}\) when FSD is the financial proxy in Model 1; ΔLL\(_{t-1}\) is represented by Δfinancial proxy\(_{t-1}\) when LL is the financial proxy in Model 2; ΔDCP\(_{t-1}\) is represented by Δfinancial proxy\(_{t-1}\) when DCP is the financial proxy in Model 3; and ΔPC\(_{t-1}\) is represented by Δfinancial proxy\(_{t-1}\) when PC is the financial proxy in Model 4, respectively.
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*
(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 !!!

QUESTIONS?

ANSWERS