

Financial Development and Economic Growth in Fiji New Empirical Evidence

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Abstract

This paper examines whether financial development promoted economic growth in Fiji over the period 1970 to 2005. The methods applied are cointegration and the error correction model to test the long run equilibrium and short run relationship among the key variables relevant for this study. Cointegration test results support the existence of a long run relationship. The short term dynamic behaviour of the relationship between financial development and growth show that financial development has made a modest contribution to output.

Introduction

It is now widely regarded that financial development, which involves the establishment and expansion of financial institutions, instruments and markets, is important for long term sustainable economic growth. In particular, financial development supports the growth process by mobilizing domestic and foreign savings for investment and ensuring that these funds are diverted to the most productive use. On the whole, financial systems serve five broad functions: (i) produce information ex ante about possible investments; (ii) mobilize and pool savings and allocate capital; (iii) monitor investments and exercise corporate governance after providing finance; (iv) facilitation of trading, diversification and management of risk; and (v) ease the exchange of goods and services (Fitzgerald, 2009). While all financial systems may provide the five func-

tions, the impact on economic growth depends on how well these are provided. The impacts of these functions on economic growth are captured by three basic characteristics of financial systems: (i) the level of financial intermediation; (ii) the efficiency of financial intermediation; and (iii) the composition of financial intermediation.

Numerous cross country and country specific empirical studies show strong causality from specific types of financial institutions towards rapid economic growth (Jung, 1986; Greenwood and Jovanovic, 1990; Roubini and Sala-i-Martin, 1992; King and Levine, 1993; Levine, 1997; Levine and Zervous, 1998; Levine *et al.*, 2000 among others). One key conclusion that can be commonly drawn from the enormous literature is that the greater the ratios of total financial assets to national income, the higher will be the levels of productivity and income per capita. In general, the key question examined within this literature has been whether financial sector influences growth in the long term. The literature is usually more supportive to the argument that financial development promotes growth in the long run. This is usually referred to as the 'supply leading' hypothesis (Patrick, 1966). On the other hand, there exists another view which argues for a relationship from economic growth to financial development (Robinson, 1952). This is known as the 'demand following' hypothesis. The existence of two distinctly opposite views has led to numerous studies investigating whether financial development leads to economic growth or vice versa, in the long run.

Despite the voluminous literature in this area, the direction of causality has remained unresolved, particularly in small developing economies. The aim of this paper is to test the possible direction of causality between financial development and economic growth in Fiji. The methods applied are cointegration and the error correction model to test the long run equilibrium and short run relationship among the key variables relevant for this study. This paper, however, is not the first study examining this relationship for Fiji. To my knowledge, there are two previous studies in this area, Jayaraman and Choong (2007) and Waqabaca (2004). However, these two empirical studies are hampered by data and empirical specification issues which could pin down the true nature of the financial development-growth relationship. For instance, Jayaraman (2007) uses private sector credit as an indicator of financial development. It is evident from the recent developments in the financial development-growth nexus literature that a single index such as private sector credit is an inappropriate measurement of financial development and therefore not a reliable indicator at all. This paper, thus, develops a measure based on three widely used indicators which include liquid liabilities of commercial banks, do-

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mestic credit to private sector and the ratio of commercial bank assets over the sum of commercial bank and central bank assets. In a Reserve Bank of Fiji Working Paper, Waqabaca (2004) uses an empirical estimation that does not include key variables of capital and labour. As noted recently by Rao and Takirua (2010) and Rao (2010) the non inclusion of these two basic conditioning variables could lead to gross misspecification and as a result the included variable estimates may be overestimated. This paper also differs from Waqabaca (2004) and several other papers estimating a neoclassical production function using investment to GDP ratio as a proxy for capital. Rao, Singh and Gounder (2007) provide empirical evidence that while investment ratio may give good results with OLS, its robustness is doubtful. In addition, combining it with the level of employment to estimate a production function would lead to misspecification bias.

Empirical Strategy and Data

Empirical Strategy

The link between financial development and economic growth rate is verified using an aggregate Cobb–Douglas production function. Although the focus of this paper is on the lead-lag relationship between a measure of financial development and economic growth, these variables interact with other conditioning variables of capital (K) and labour (L). Following Rao (2010), the basic Solow (1956) model and its extension by Mankiw, Romer and Weil (1992), MRW hereafter, is used. The MRW Cobb-Douglas production function is provided below:

$$Y = K^\alpha H^\beta (AL)^{1-\alpha-\beta} \quad (1)$$

where K is physical capital, H is human capital, L is labour supply and A is an index of technical efficiency.

An assumption of MRW is that investment rates in physical and human capital (s_k and s_h respectively) are constant, and that both types of capital depreciate at a common rate (δ). MRW also assumes that technical efficiency grows at the same exogenous rate (g) across countries and the labour force grows at differing rates (n). This is obviously just the Solow model augmented with human capital and the assumption that countries share the same rate of efficiency growth. In implementing the MRW model empirically for this purpose with time series data requires modification. Firstly, the dependent variable is the rate of growth of output.

Secondly, we assume that there are constant returns and technology is Hicks neutral. Finally, the variable of financial development is introduced into the model as shift variable into the production function.

Following MRW the long run equilibrium production function is specified as follows:

$$Y = f(K, L, FD) \quad (2)$$

where Y is the growth rate of real GDP; K , L , and FD represent, respectively, capital, labour, and a measure of financial development.

Specification of the production function in the log liner form (with an error term, μ_t) may be written in the following way:

$$\ln Y_t = \alpha_0 + \alpha_1 \ln CAPITAL_{t-1} + \alpha_2 \ln LABOUR_t + \alpha_3 FD_t + \mu_t \quad (3)$$

The testing procedure will involve three steps. The first is to test the existence of unit roots followed by the test for cointegration. Following Engle and Granger (1987), Johansen (1988), and Johansen and Juselius (1990), this paper will employ the cointegration procedure and vector error correction model (VECM) to test the long run equilibrium and short run relationship among variables in equation 2. According to Granger representation theorem, if the series are cointegrated, the dynamic relationship involving the variables could be examined within VECM framework. For the four variable case with one cointegrated relationship, the VECM will have four equations. This leads to the specification of VECM of the production function of the following forms:

$$\Delta \ln Y_t = \beta_0 + \beta_1 \Delta \ln Y_{t-1} + \beta_2 \Delta \ln CAPITAL_{t-1} + \beta_3 \Delta \ln LABOUR_{t-1} + \beta_4 \Delta \ln FD_{t-1} + \beta_5 EC_{t-1} + \mu_t \quad (4)$$

$$\Delta \ln L_t = \beta_0 + \beta_1 \Delta \ln Y_{t-1} + \beta_2 \Delta \ln CAPITAL_{t-1} + \beta_3 \Delta \ln LABOUR_{t-1} + \beta_4 \Delta \ln FD_{t-1} + \beta_5 EC_{t-1} + \mu_t \quad (5)$$

$$\Delta \ln K_t = \beta_0 + \beta_1 \Delta \ln Y_{t-1} + \beta_2 \Delta \ln CAPITAL_{t-1} + \beta_3 \Delta \ln LABOUR_{t-1} + \beta_4 \Delta \ln FD_{t-1} + \beta_5 EC_{t-1} + \mu_t \quad (6)$$

$$\Delta \ln FD_t = \beta_0 + \beta_1 \Delta \ln Y_{t-1} + \beta_2 \Delta \ln CAPITAL_{t-1} + \beta_3 \Delta \ln LABOUR_{t-1} + \beta_4 \Delta \ln FD_{t-1} + \beta_5 EC_{t-1} + \mu_t \quad (7)$$

where EC_{t-1} is the error correction term (ECT) lagged one period.

The sign and size of the coefficient of the ECT will reflect the direction and speed of adjustments in the dependent variable to deviations from the linear long run relationship.

Measure of Financial Development

Since there is no single aggregate index, this paper constructs an index of financial development which measures the overall development in the financial sector. Following the recent examples by Huang (2010) and Ang and McKibbin (2007), the relevant financial proxies used to construct a measure of FD are *commercial bank assets to commercial bank plus reserve bank assets ratio* (the ratio of commercial bank assets over the sum of commercial bank and central bank assets), *liquid liabilities to GDP* (liquid liabilities of banks and non banking financial intermediaries over GDP) and *private sector credit by deposit money banks to GDP* (credit issued to the private sector by banks divided by GDP). The principal component analysis is used to reduce the three variables to a single variable while retaining as much information of the original variables.

Table one presents the results of the principal component analysis. The eigenvalues show that the first principal component explains about 80.87% of the standardized variance, the second principal component explains another 17.63% and the final principal component accounts for only 1.49% of the variation. It is apparent that the first principal component better explains the variations of the dependent variable and thus is the best measure of financial development based on this analysis. The first principal component is a linear combination of the three financial proxies with weights specified by the first eigenvector. After rescaling, the individual shares of commercial bank assets to commercial bank plus reserve bank assets, liquid liabilities to GDP and private sector credit by deposit money banks to GDP to the standardized variance of the first principal component are 24.83%, 37.5% and 37.67% respectively.

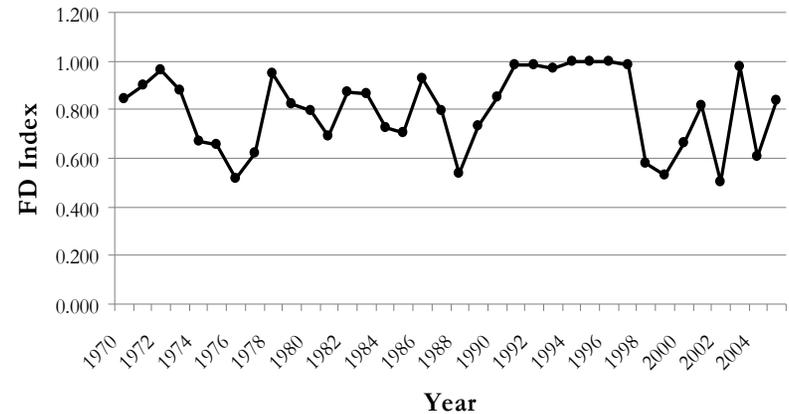
Table 1: Principal Component Analysis, Financial Development Index

	PCA 1	PCA 2	PCA 3
Eigenvalues	2.426	0.529	0.045
% of variance	80.871	17.639	1.491
Cumulative %	80.871	98.509	100.00
Variable	Vector 1	Vector 2	Vector 3
CB	0.498	0.867	-0.008
LL	0.612	-0.358	-0.705
PS	0.614	-0.347	0.709

Notes: CB = commercial bank assets to commercial bank plus reserve bank assets, LL = liquid liabilities to GDP, and PS = private sector credit by deposit money banks to GDP. PCA = principal component analysis.

Figure one plots the resulting index of FD.

Figure 1: Financial Development Index



The index coincides fairly well with the economic state of affairs and policy changes that happened during the sample period. As is apparent in the index, the level of financial development from 1992 to 1995 appears to be relatively high and stable. As expected, 1987 and 2000 saw huge fall in the index, coinciding with the coups and political cataclysm that followed. The sharp increase from 1989 until 1992 could be attributed mainly to the financial and fiscal reforms implemented in response to the ailing economy after the 1987 coup. In particular, financial stability had started to emerge by 1988 with commercial bank liquidity and total liquidity, broad money had turned around and a strong growth in domestic credit beginning in 1989 (Siwatibau, 1996). Relevant policies which contributed to the turn around and an improvement in financial development after the 1987 coup and furtherance until 1995 include deregulation in the financial sector which had just started, and elimination of interest rate controls. The index remained fairly stable before the onset of the collapse of the National Bank of Fiji in 1996.

Data Source

The data on three indicators used to generate a measure of FD are acquired from the World Bank, Financial Structure and Economic Devel-

opment Database (2007). The data series for the other variables were obtained or compiled from Key Statistics of the Fiji Islands Bureau of Statistics and Quarterly Review of the Reserve Bank of Fiji. Capital stock has been estimated by Professor Bhaskara Rao with the perpetual inventory methods with the assumption that the depreciation rate is 4%. The initial capital stock estimate used for 1970 is F\$1446.225m. Labour is employment and *Y* is real gross domestic product per capita in 1995 prices.

Empirical Findings and Discussion

The empirical work starts with unit root tests on the variables. One of the reasons to test for unit roots is that the existence of unit root in a group of series makes it possible to identify the presence of a long run relationship between the series. This paper uses two unit root tests developed by Dickey and Fuller (DF) (1979, 1981) and Phillips and Perron (PP) (1998). Table two shows the results of the two unit root tests. Each data series is found to be non-stationary in levels and stationary in first difference, implying that all the series are integrated of order one. The next step is to test for the existence of a long run cointegration among capital stock, labour, financial development and economic growth. Table three shows Johansen cointegration test results. The Schwartz Information Criteria (SIC) is used to select the number of lags required in the cointegration test. The conclusion based on the trace statistics is that there is one cointegrating vector among the four variables. This result indicates that the four variables do not move too far away from each other over time.

The finding of the existence of at least one cointegrating equation suggests the presence of co-movements among the variables, indicating long run stationarity. The estimates of long run cointegrating vectors are presented in table 4. By normalizing the coefficient of *Y* to one, the estimated coefficients capital and labour are positively related to output. However, the results show a negative but very small long run relationship with respect to financial development. All the coefficients are significant at 1% level.

Table 2: Unit Root Tests

	<i>lnY</i>	<i>lnK</i>	<i>lnL</i>	<i>lnFD</i>
	Statistic (LL)	Statistic (LL)	Statistic (LL)	Statistic (LL)
Level				
ADF	-2.707 (4)	-3.403 (5)	-2.506 (0)	-1.720 (1)
PP	-1.138 (4)	-3.581 (1)	-2.290 (1)	-3.110 (1)
Δ				
ADF	-5.061 (0)	-3.930 (0)	-7.332 (0)	-10.248 (0)
PP	-5.159 (4)	-4.420 (0)	-8.002 (2)	-10.090 (1)

Notes: critical values at the 5% level. LL is lags.

Table 3: Cointegration Tests: *lnY lnK lnL lnFD*

	Trace Test	5% critical value	<i>p</i> values
H ₀ : <i>r</i> = 0	56.69	47.85	0.005
H ₀ : <i>r</i> ≤ 1	27.05	29.79	0.1
H ₀ : <i>r</i> ≤ 2	8.33	15.49	0.429
H ₀ : <i>r</i> ≤ 3	1.48	3.84	0.223

Notes: Trace test indicates one cointegrating equation at the 5% level; *r* denotes the number of cointegrating vectors; Trend assumption: linear deterministic trend; *p* values are from MacKinnon-Haug-Michelis (1999).

Table 4: Estimates of Long Run Coefficients

<i>lnY</i>	Constant	<i>lnL</i>	<i>lnK</i>	<i>lnFD</i>
1.00	18.008	1.738 (-44.93)***	0.708 (-16.99)***	-0.025 (5.79)***

Notes: *t* statistics are in parenthesis; (***) denote significance at the 1% level.

Estimates of the long run coefficients, however, do not provide any information on the short run dynamics. Table 5 provides results estimated by vector error correction modelling technique to examine the short run dynamics and to test the hypothesis of Granger causality.

Table 5: VECM Regression Results

	$\Delta \ln Y$	$\Delta \ln L$	$\Delta \ln K$	$\Delta \ln FD$
$\Delta \ln Y (-1)$	0.6608 (2.353)**	-0.4150 (-2.700)**	-0.0066 (-0.0747)	12.26 (1.542)
$\Delta \ln K (-1)$	0.0896 (0.147)	0.2105 (0.6316)	0.4556 (2.361)**	-7.922 (-0.459)
$\Delta \ln L (-1)$	-1.3097 (-3.304)***	0.2217 (1.022)	-0.0070 (-0.056)	1.360 (0.121)
$\Delta \ln FD (-1)$	0.0227 (2.183)**	-0.0083 (-1.470)	0.0009 (0.278)	-0.326 (-1.104)
$\Delta \ln FD (-2)$	0.0265 (2.726)***	0.0037 (0.7062)	0.0008 (0.287)	0.008 (0.032)
$\Delta \ln FD (-3)$	0.0182 (2.020)*	0.0062 (1.2615)	0.0006 (-0.242)	-0.291 (-1.14)
$ECT(-1)$	-1.205 (-3.192)***	0.6853 (3.315)***	-0.094 (-0.789)	-7.665 (-0.716)
Diagnostics				
<i>Adjusted R</i> ²	0.29	0.42	0.70	0.11
σ	0.065	0.035	0.020	0.850
$\chi^2 N (2)$	1.51 [0.217]	0.14 [0.707]	0.009 [0.921]	0.07 [0.785]
$\chi^2 Het (1)$	26.87 [0.415]	24.49 [0.547]	30.41 [0.250]	23.92 [0.580]
<i>LM Test SC</i>	16.066	[0.448]		
Notes: <i>t</i> statistics are in parenthesis; (***) , (**) and (*) denote significance at the 1%, 5% and 10% levels respectively; σ is the standard error of regression; Diagnostics are chi-squared statistics for normality (N) and heteroskedasticity (Het), and LM Statistic for serial correlation (SC); <i>p</i> values are in brackets .				

In the model, output lagged one period, labour force lagged one period and financial development index lagged one and two periods have emerged as significant variables. The error correction coefficient, estimated at -1.205 is statistically significant at the 1% level and has the correct sign. The diagnostics tests show no evidence of misspecification, no serial correlation, nor any issues of heteroskedasticity and no problem of non-normality of results. The labour force variable has a negative sign implying that its contribution to GDP has declined. This negative coefficient of labour force is consistent with other studies employing similar regressions (for example, Rao, Singh and Gounder, 2007).

The coefficient of FD implies that a 10% increase in overall financial development will have a 0.2% increase on output, a marginal contri-

bution. Even a two period lagged coefficient was very close to the one period lagged coefficient. Such a modest contribution to output shows that financial institutions in Fiji seem to have played a minor role in supporting the growth process through its broad functions. For short run causality, the results show that financial development promotes growth but not vice versa. So while there is short run Granger causality between finance and growth, no feedback relationship is observed. This confirms the supply leading hypothesis for Fiji in the short run.

So, why has financial development only made a meagre contribution to growth in Fiji in the short run? With five commercial banks, ten insurance companies and one development bank, Fiji has the widest range of financial institutions in the South Pacific. Three plausible explanations can be offered.

Firstly, there is a lack of depth and sophistication of the financial sector in Fiji. Financial intermediaries generally allow a more efficient allocation of resources if all institutional innovations such as bond markets, stock markets, insurance and banking are combined to operate capably. It is also well known that the development of the financial sector helps to improve the allocation of risk in the economy and increases the efficiency of the saving and investment process. However, in the case of Fiji, the significance of bond and stock markets has not risen over the last decade and thus are still in embryonic form. As a result bond and stock markets cannot be expected to play a significant role. Like other financial intermediaries, we expect bond and stock markets to influence economic growth and development through the savings rate and the quantity and quality of investment. Unsurprisingly the banking sector is left alone with the bulk of this responsibility. Indeed the banking sector dominates the financial sector and is characterized by features such as urban operations, excess liquidity, limited competition, generally high profits and large interest rate spreads (Asian Development Bank, 2001).

The second issue concerns financial exclusion due to price and non-price barriers. For a long time banks in Fiji did not extend their operations beyond urban areas. It was only recently that rural banking through mobile banks has been made available. This may have served as a non-price barrier preventing small firms and poor households in rural areas from using financial services. The possibility of price barriers as an obstacle to financial inclusion has also been a concern towards equalizing opportunities. As noted by Sharma and Ngyuen (2010) and Jayaraman and Choong (2007), there exists evidence that bank fees and charges are relatively high in Fiji. A recent World Bank study argues that without inclusive financial systems, talented poor individuals and small entrepreneurs are

weakened as they have to settle with their own savings and earnings for further progress. So promoting a broader access to financial services improves overall efficiency and promotes growth and employment. However, voluntary financial exclusion by individuals and small entrepreneurs, whether due to price or non-price barriers, hinder growth promoting opportunities and thus impacting economic growth.

Third, an important characteristic in the financial system of Fiji is the presence of Fiji National Provident Fund (FNPF) which is a social security savings institution. The compulsory contributions by employees and employers to FNPF are a significant proportion of total savings in Fiji. The banks, therefore, have a relatively less important role to play in terms of mobilizing savings and allocating resources. This is the third plausible explanation for the relationship observed from the empirical results. Though savings are channelled to FNPF, there is no evidence to show that these funds have been allocated to the most productive sectors efficiently. If capital is not allocated to the most productive use or goes to the wrong uses, the economy will operate inefficiently, and ultimately economic growth will be low (Mishkin, 2006). In fact a recent report by the joint IMF-World Bank financial sector assessment program noted that the FNPF is major source of distortion in the financial sector and that it is ‘...too large and pervasive in the financial system and has hampered capital market development’ (World Bank, 2007).

While the short run results are consistent with the supply leading hypothesis of financial development and growth, the long run results show a very small negative relationship between financial development and growth. Why could this be the case? One reasonable explanation for this could be the existence of interest rate controls prevalent in Fiji until 1987, a period which makes up a third of the sample for this study. There are two ways of interpreting this issue. First, there is the argument that government interventions such as interest rate controls and high reserve requirements create financial market imperfections which could be highly detrimental to both financial development and economic growth (McKinnon, 1973; Shaw, 1973). Second, there is strong evidence that financial liberalization increases both growth and volatility of output (Levchenko, Ranciere and Thoenig, 2009). Levchenko *et al.* provide empirical evidence that while financial liberalization is supposed to increase the allocation of capital and increase growth, there is no persistence effect on output growth. So the process of financial liberalization which began in 1980s and the collapse of the National Bank of Fiji in the mid 1990s could have coupled to produce this negative relationship observed in the long run. Further, and having noted the above, this negative relationship

questions whether there are economic conditions that could influence the conventional theory of financial development – economic growth relationship, in particular the possibility of the existence of a non-linear relationship between growth and macroeconomic variables including financial development (Keho, 2010). For example, studies by Huybens and Smith (1999), Rousseau and Wachtel (2002), and Lee and Wong (2005) have provided important contributions to the finance and growth literature by showing that financial development promotes economic growth only under low or moderate inflation rates. Another emerging research area suggests that political institutions influence financial development and its impact on economic performance (Huang, 2010). Future research for Fiji should look at the empirical relationship between the level of financial development and (i) economic growth, (ii) total factor productivity growth, (iii) political institutional improvement, and (iv) inflation.

Concluding Remarks

Though there is a burgeoning literature supporting the importance of financial development on economic growth, the relationship is crucially dependent upon the nature and operation of financial institutions, markets and policies pursued by individual countries. The results from this study show that financial development has made a small contribution to economic growth in Fiji during the period under study. This paper also attempts the complex task of measuring the depth of financial development by using principal component analysis to construct a single index. Though financial sector liberalization began in early 1980s and has broadened the sector, the sector still lacks the depth and sophistication required to improve the allocation of risk in the Fijian economy and increase the efficiency of the savings and investment process.

Our findings do not suggest that financial development is not crucial for the Fijian economy. To the contrary, while financial development has contributed to growth, the effect has been modest. Even so, the policy implication is clear, financial innovation and development can be one of the means to accelerate economic growth and reduce poverty. We, however, have not investigated whether financial development reduces poverty directly through distributional effect, beyond its indirect effect as a result of economic growth. With poverty reduction being a critical issue, future research could study the linkages between financial development, economic growth, income distribution and poverty reduction.

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