Finance-Growth Nexus: A Threshold Effect

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Abstract

Existing empirical research fails to provide robust support concerning the impact of financial development on economic growth, in the presence of substantial variations across different time periods and country groups. It is suggested that the variations in question are to be accounted for by a threshold effect, in support of which, it seems to have been found modest empirical evidence. Panel-data analysis for a set of 32 developing and developed countries for the period of 1990 – 2001 indicates a threshold level of financial development, with the implication that positive effects fail to materialize at relatively lower stages of financial development. Moreover, financial development has actually got a negative impact on GDP per capita, unless it exceeds the threshold level.

Keywords: *financial markets, economic growth, threshold effect, panel data*

JEL Classification: C23, E44, G20, O16

1. Introduction

Ensuing the rise of the monetary growth theories, a vast literature enquiring the association between financial development and economic growth has been emerged, whose proliferation is rather impressive, both theoretically and empirically. Whereas the monetary growth theories, treating money and investment demand as substitutes, see the growth impact of financial development to be negative, the emergent literature has, following the pioneering works of McKinnon (1973) and Shaw (1973), come to highlight positive effects. Indeed, it is the argument of the McKinnon-Shaw model that, as long as money demand or demand for real balances increases, investment demand is also bound to rise, eventually.

Recently, endogenous growth theories have supplied additional tools to enquire the connection between the financial indicators and the growth variables. A variety of channels have now been proposed, positing, as they are, a positive

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impact of financial development on economic growth. For one thing, financial intermediation is argued to affect not just the level of growth variables per capita income and capital, but long-term growth rates as well. It promotes investment via higher volumes of savings, by way of either reducing the systemic liquidity risk or facilitating the mobilization of savings. Moreover, the efficiency of the banking system and of financial intermediaries comes into play to prevent the leakages from the system, increasing thereby the amount of savings conveyed into investment. As the more efficient technologies normally require initially higher levels of investment, financial development could also enhance the productivity of capital via the supply of necessary funds for opportune investment outlets. Financial markets also distribute and diversify risks, rendering riskier yet productive investments more attractive to entrepreneurs. Finally, financial intermediaries, by closely monitoring investors, could compel them to allocate funds to a lot more productive investments.

Though most models concentrate on the positive effect of financial development on economic growth, empirical studies do not always end up supplying much support of that. Accordingly, while King and Levine (1993a) demonstrate that various indicators of financial development have got a positive impact with respect to both investment and productivity, De Gregorio and Guidotti (1995) suggest that, the impact in high income countries is relatively small, if not nil. Similar conclusions are also reached in Hanson and Jonung (1997), where financial development is effective in the early periods of economic development. Again in the same context, Demetriades and Hussein (1997) empirically investigate the relationship between financial development and economic growth, with a focus now on the direction of causality in question. But as their results turn out to be sensitive to the estimation methods and the country groups, they are neither uniform nor robust. Besides, and in terms of causality, they fail to get any strong evidence of economic growth ensuing financial development. It is interesting that their causality estimation results support instead reverse causality for most of the countries dealt with.

In a recent study, Benhabib and Spiegel (2000), attempt at setting forth the possible channels of financial development promoting economic growth. Using panel-data regression methods, they essay to see if financial development affects economic growth via physical-capital formation or productivity gains. Financial development variables have got a significant positive effect on capital formation and productivity in the equations without country-fixed effects, but once the lat-ter are paid heed and included, financial development variables then turn insignificant. That should reveal that financial development does not have a direct bearing on countries' growth performances, that it rather represents other country-specific

factors affecting growth processes. To sum up, Benhabib and Spiegel (2000) fail to come up with clear and strong evidence of the positive impact of financial development on the determinants of economic growth.

Al-Yousif (2002) also explores the causal relationship between economic growth and financial development, for a selected group of countries. Direction of causality turns out to be mixed, depending on country subsets. Also, both bi--directional causality and insignificant finance-growth relation are obtained for different country groups. Similar bi-directional causality is obtained by Luintel and Khan (1999) as well. Finally, according to a recent paper by Fase and Abma (2002), financial development matters for economic growth, with causality running from the level of financial intermediation and towards economic growth.

To conclude, the empirical literature reviewed above does not provide any strong evidence in favour of the positive impact of financial development on growth. Results vary for the different time periods and country groups. The variation in question might well indicate a systematic non-linear relationship, with non-linearity relating to the levels of some specific economic variables. Alternatively speaking, the relationship between financial indicators and economic growth could vary according to the threshold levels of some specific economic variables, making the effect of financial development insignificant or even negative below the thresholds, and significant and positive above. One should also take note of the few empirical studies treating the threshold effect in question (Rioja and Valev, 2004; Deidda and Fattough, 2002; Berthelemy and Varoudakis, 1996).

Berthelemy and Varoudakis (1996) estimate an equation mainly to test conditional convergence with certain control variables. The stability of parameters with varying initial financial development levels is tested by Chow tests. It is suggested that equation estimates are unstable at a certain level of initial financial development. According to subsequent estimations for a different cluster of economies, increasing the size of the financial sector effectively improves the growth performances of countries with sophisticated financial sectors, whereas, for those with poorly-developed financial systems, a marginal increase in its size actually reduces growth performance.

Deidda and Fattouh (2002) analyze the threshold effect of income levels on the finance-growth relationship. They argue that the effect of financial development on growth positively varies with the initial level of real per capita income. Estimation results indicate that there exists no significant relationship between financial development and growth in low- income countries, whereas, in high-income countries, the selfsame relationship turns to be positive and strongly significant.

Rousseau and Wachtel (2002) is yet another attempt to find out the changing behavior of the finance-growth nexus. It is conjectured that the effect of financial

development upon growth is insignificant under the circumstances of high levels of inflation. Estimation results indicate that financial depth has got a significant positive effect on growth only whence inflation is below some threshold of, approximately, 6 to 8 per cent.

To the best of my knowledge, the most recent paper exploring the impact of financial development on economic growth in terms of the threshold effect of economic variables is that by Rioja and Valev (2004). They select three different financial development variables as threshold variables and obtain differential effects by way of using dummies. They find evidence for the differential effect of finance on growth in the case of two distinct regions. Estimation results suggest that the effect of financial variables is positive and significant for the regions whose levels of financial development fall into the middle range. However, two of the three financial development variables in question fail to yield significant differences in the case of the regions with levels of financial development lower than those of the mid-range ones. On the other hand, in the case of the regions with high levels of financial development, differential effects of all three financial variables on growth performances are positive. While it is concluded that the specific level of financial development plays a key role *vis-à-vis* the differential relationship between financial development and growth, one is not clear if financial development is a significant variable in the growth equations for each of the distinct regions – especially the low regions. Definite threshold levels of financial development are also not found causing a significant difference on finance-growth nexus.

Hence, the overview of the existing empirical literature highlights the following points: The conjectured positive relationship between finance and growth has not much received strong support. Nor the exact nature of causal relationship between financial development and growth has been made clear at any satisfactory rate. Overall, the results of empirical studies usually depend upon the time periods and country groups. Given the varying association between finance and growth in different cases, one would tend to hypothesize the dependence of this relationship on the economic environment. A variety of empirical studies have suggested that both the direction and the significance of the finance-growth relation are conditional upon the specific levels of such macroeconomic variables as inflation, financial development and income. Yet, while such studies are really limited in number, the methods they have employed seem inadequate to resolve the question of the threshold effects on the relationship between finance and growth.

My chief aim here is to clarify the changing relationship between finance and growth, conditional to the level of financial development. I also wish to define

the threshold level for two different financial development indicators that are critical on the relationship between the financial indicators and growth. As mentioned above, and, to the best of my knowledge, there are two studies alone that have tackled that question (Berthelemy and Varoudakis, 1996; Rioja and Valev, 2004). Both seem to come up with some important insights *vis-à-vis* the differential effect of the level of financial development on growth. Distinguishing my attempt are its method and the variables included. While Berthelemy and Varoudakis use cross-section data and the initial level of financial development as threshold variable, I prefer to use panel data and the current level of financial development as threshold variable. In comparison with the dummy-variable method used by Rioja and Valev in the identification of the threshold level, I choose to use structural-break tests namely chow tests. Besides, and in contradistinction with prior studies, the effects of lagged- values of financial development are explored as well.

2. Methodology and Data

As in the Solow Growth model, we begin with Cobb-Douglas production function which exhibits constant returns to scale where per capita output is a function of capital per capita. We prefer to estimate "augmented Solow model" by adding explanatory variables other than capital per worker into per capita output equation. Specifically, let y equal per capita GDP, k equal per capita capital, x equal other determinants of per capita output so that $y = k^{\alpha}x^{\beta}$. Taking natural logarithims yields $\ln y = \alpha \ln k + \beta \ln x$. In our estimates financial development variables are added into per capita output equation as other explanatory variables. The following equation is estimated in order to obtain the effect of financial development on per capita output and to determine the threshold level of financial development variables.[1]

$$\ln GDPPC = \beta_0 + \beta_1 \ln INVPC + \beta_2 \ln FD + \beta_3 \ln FD_{-1} \qquad (1)$$

GDPPC denotes the economic growth indicator and is defined as GDP per capita in dollar terms. INVPC refers to investment per capita in dollar terms. In lieu of the capital-labour ratio or the per capita capital stock as the determinant of GDP per capita, investment per capita is preferred, in view of the difficulties involved in procuring the necessary capital-stock data for various countries. FD represents the financial development indicator. Current value and one-period lagged-value of financial development are employed in the regression. We use

[1] All the data are obtained from IFS CD-Rom.

two indicators of financial development that are constructed to measure services provided by financial intermediaries. First we compute well-known King and Levine's (1993b) measure of financial depth that equals the overall size of the formal financial intermediary system. This measure of financial depth (FDEPTH) equals liquid liabilities of the financial system (currency plus demand deposits plus interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. When unavailable, M2 is used in lieu of liquid liabilities. Our second financial development indicator DEPB, which is firstly used in King and Levine (1993b), equals the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets. This measure indicates the importance of deposit banks relative to the central bank in the system. Banks probably offer better risk management and investment information services than central banks, so higher values of DEPB should correspond to more financial services and higher levels of financial development. All variables are put in logarithmic form due to the presence of non-linearity in growth equations.

As a first step we use FDEPTH as financial development variable in the estimations of equation one. In the second group of estimations we use DEPB as financial development indicator.

A pooled data set of 32 developing and developed countries for the period 1990 – 2001 is employed.[2] Panel-data estimation method of both pooled- regression and fixed-effect model estimation is performed. We have preferred to provide the results of both models to get thick modelling with more robust results. In other words, various possible model results are considered to see whether the significance, size and sign of the coefficients change or not under different modellings. Fixed-effects specification is mainly used to account for time-invariant unobservable heterogeneity that is potentially correlated with the dependent variable. In so doing, we also expect to isolate the omitted-variable problems in the regression, by way of capturing the idiosyncratic factors that might affect GDP per capita. In sum, for both financial development indicators we performed four GDP per capita equation estimations. The first equation is estimated with full sample and pooled OLS method. Fixed effect model estimation with entire sample of countries is the second one. The third and fourth fixed effect model regression estimates are performed through dividing sample of countries according to threshold level of financial development. For the reason that the threshold level of financial development is not known a priori we performed structural break tests repeatedly for various levels of financial development during the

[2] Here is the list of the countries, in ascending order in terms of financial depth (FDEPTH) level: Madagascar, Senegal, Guatemala, Ecuador, Oman, India, Turkey, Uruguay, Sri Lanka, Poland, Brazil, Nicaragua, Nepal, Chile, Ethiopia, Jamaica, Hungary, Tunisia, Philippines, Germany, Canada, US, Central Africa, Slovakia, France, Portugal, Netherlands, Spain, Egypt, Austria, UK, Japan.

fixed-effect model estimations for entire sample.[3] The level of financial developments that creates structural break and also difference in the significance and/or sign of coefficient of financial development variable above and below the structural break point are considered as threshold levels. Accordingly, we divide our sample of countries into two groups using threshold levels. Third estimation implemented with financially less developed countries that have average financial development level below threshold while fourth one is performed with financially developed countries above the threshold.

3. Estimation Results

In order to ascertain the existence of relation between financial development and GDP per capita and to find out the location of proposed threshold levels eight regressions are run. For each of the financial development variables we estimated four regressions. First set of findings belongs to estimations using FDEPTH as financial development variable while second set consists of the results obtained from the estimations using DEPB as financial indicator.

3.1. Financial Depth

Table 1

Results of Pooled-regression Estimation for FDEPTH*

Dependent Variable: lnGDPPC				
Variable	**Coefficient**	**Std. Error**	**t–Statistic**	**Prob.**
C	–35.71485	540.8841	–0.066031	0.9474
LnINVPC	0.590684	0.027982	21.10916	0.0000
LnFDEPTH	–0.367538	0.053740	–6.839139	0.0000
LnFDEPTH$_{-1}$	0.066189	0.046529	1.132514	0.2588
AR(1)	1.082552	0.061471	17.61064	0.0000
AR(2)	–0.082213	0.061830	–1.329664	0.1849
R–squared	0.976564	**Mean dependent var**		8.087549
Adjusted R–squared	0.975735	**S.D. dependent var**		1.764014
S.E. of regression	0.067518	**Sum squared resid**		1.116863
F–statistic	34081.33	**Durbin–Watson stat**		2.075605

*Estimation method is OLS; standard errors and covariances are White-heteroskedasticity-consistent.

To start with, GDP per capita equation is estimated by pooled-regression for the entire sample using financial depth as financial development indicator. As shown in Table 1, investment per capita and current financial depth are the statistically significant variables in the GDP per capita equation. The lagged-value of financial

[3] We adopted Chow-test as structural break test.

depth is an insignificant variable. Though the parameter estimate of investment per capita variable has got a positive sign, current value of financial depth variable has got a negative sign. The negative sign indicates an inverse relationship between GDP per capita and the level of financial depth for the entire sample.

AR(1) and AR(2) terms are inserted into the regression to deal with the autocorrelation problem.

Next, the GDP per capita equation (Equation 1) is estimated with a fixed-effect model, by using data for all the countries in the sample. The fixed-effect model gives advantage of capturing idiosyncratic differences among cross-section units that might possibly affect GDP per capita.

The fixed-effect model estimation gives somewhat different results from those of the pooled estimation. Once again, the investment variable is significant with a positive parameter. It confirms the existence of a strong positive relation between investment per capita and GDP per capita. The current value of the financial depth variable has got a significant negative parameter, indicating diminishing effects on GDP per capita for the whole sample. The differences of the fixed-effect model estimation results come from the significance of lagged financial depth variable. A positive sign for the lagged financial depth variable points to the positive effects of previous-year financial depth on current-year GDP per capita.

Table 2

Results of Fixed Effect Estimation for FDEPTH with Whole Sample*

Dependent Variable: lnGDPPC				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LnINVPC	0.592831	0.020855	28.42676	0.0000
LnFDEPTH	–0.184678	0.049006	–3.768458	0.0002
LnFDEPTH$_{-1}$	0.088503	0.046608	1.898891	0.0585
AR(1)	0.617486	0.035254	17.51532	0.0000
R-squared	0.988405	**Mean dependent var**		9.117549
Adjusted R-squared	0.988321	**S.D. dependent var**		2.920781
S.E. of regression	0.076104	**Sum squared resid**		1.430564
F-statistic	138374.9	**Durbin-Watson stat**		1.903334

*Estimation method is GLS (cross section weights), standard errors and covariances are White-heteroskedasticity-consistent. Country-specific fixed effects (constant terms) are not reported.

The AR(1) term is once again included to remove the autocorrelation problem.

Next, remains to be seen if the significance and direction of the effect of financial development on GDP per capita varies *vis-à-vis* the different levels of financial depth. Alternatively speaking, I intend to come up with a threshold level of financial depth that would be distinctive for the significance and direction of

its effect on growth variables. To that end, structural break tests performed repeatedly for the various levels of financial depth. Structural break tests actually confirm the presence of multiple structural break-points. A structural break-point is reported as the threshold level whence the significance of financial depth variables changes above and below the structural break point.

A threshold level appears where the 12-year (1990 – 2001) average ratio of liquid liabilities to GDP equals 0.43. Hence, countries for which the 12-years average ratios of liquid liabilities to GDP remain below the threshold are considered to be financially less-developed, while those with ratios exceeding the threshold, financially developed in terms of financial depth.

In our sample, the countries which have twelve year average financial depth level below threshold are Madagascar, Senegal, Guatemala, Ecuador, Oman, India, Turkey, Uruguay, Sri Lanka, Poland, Brazil, Nicaragua, Nepal and Chile. As for the estimation of GDP per capita equation for financially less-developed countries with fixed effect model, it turns out that investment per capita has once again got a positive effect on GDP per capita (Table 3).

Table 3

Fixed Effect Regression Results of FDEPTH for Financially Less Developed Countries*

Dependent Variable: lnGDPPC				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LnINVPC	0.580252	0.046808	12.39656	0.0000
LnFDEPTH	–0.374678	0.075106	–5.016458	0.0000
LnFDEPTH$_{-1}$	0.079503	0.059208	1.341891	0.1820
AR(1)	0.712486	0.060254	11.71532	0.0000
R-squared	0.996605	**Mean dependent var**		7.124754
Adjusted R-squared	0.996104	**S.D. dependent var**		2.920781
S.E. of regression	0.072614	**Sum squared resid**		0.595864
F-statistic	11084.29	**Durbin-Watson stat**		1.967287

*Estimation method is pooled least square, standard errors and covariances are White-heteroskedasticity-consistent. Country-specific fixed effects (constant terms) are not reported.

The coefficient of investment per capita variable is rather close to unity for the overall group (Table 2). The negative effect of current financial development is greater than its effect for the overall group, due to the relatively larger parameter estimate (Table 2 and Table 3). Hence, one can argue that the negative effect of financial depth on GDP per capita is relatively larger in countries with low levels of financial development. Looking at the low t-ratio (Table 3), one can also state that previous-year financial depth does not impart any significant impact on GDP per capita, in contradistinction with the positive significant effect for overall group.

Next estimation outcomes, as reported in Table 4, are the GDP per capita equation estimates for financially developed countries. In our sample the financially developed countries are Ethiopia, Jamaica, Hungary, Tunisia, Philippines, Germany, Canada, US, Central Africa, Slovakia, France, Portugal, Netherlands, Spain, Egypt, Austria, UK and Japan which are above the threshold.

The estimation outcomes are vastly different from those obtained for financially less-developed countries. While previous-year financial depth has got a positive significant effect, current-year financial depth does not have a statistically significant negative effect on GDP per capita, in contradistinction with the significant negative effect obtained for financially less-developed countries and the overall sample. Moreover, one observes the parameter of previous year variable indicating a larger positive effect in financially developed countries in comparison with the overall group. As before, investment per capita exerts positive effects on GDP per capita.

Table 4

Fixed-effect Regression Results of FDDEPTH for Financially Developed Countries*

Dependent Variable: lnGDPPC				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LnINVPC	0.680252	0.037085	18.39656	0.0000
LnFDEPTH	–0.014678	0.102106	–0.146458	0.8850
LnFDEPTH$_{-1}$	0.227503	0.094682	2.408791	0.0176
AR(1)	0.628700	0.106231	5.918732	0.0000
AR(2)	–0.307147	0.068331	–4.494971	0.0000
R-squared	0.999303	**Mean dependent var**		9.148204
Adjusted R-squared	0.999165	**S.D. dependent var**		2.920781
S.E. of regression	0.041024	**Sum squared resid**		0.178464
F-statistic	38012.06	**Durbin-Watson stat**		2.045287

*Estimation method is pooled least square,and, standard errors and covariances are White-heteroskedasticity-consistent. Country specific fixed effects (constant terms) are not reported.

3.2. Deposit Money Banks

In order to see the effect of second financial development variable, DEPB on the GDP per capita four regressions are implemented. First one is GDP per capita equation estimation with pooled regression for entire sample.

Both current and lagged-value of financial development variable DEPB are insignificant variable in GDP per capita equation. In addition, we observe that current DEPB variable has got a negative coefficient estimate. Again investment per capita has positive significant effect on GDP per capita. In sum, this pooled estimation indicates that the alternative financial development variable DEPB does not have positive effect on GDP per capita for whole sample.

Table 5

Results of Pooled-regression Estimation for DEPB*

Dependent Variable: LnGDPPC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	38.18595	1912.789	0.019963	0.9841
LnINVPC	0.681390	0.026906	25.32482	0.0000
LnDEPB	–0.018422	0.054846	–0.335883	0.7372
LnDEPB$_{-1}$	–0.016896	0.034800	–0.485514	0.6277
AR(1)	1.072982	0.062223	17.24403	0.0000
AR(2)	–0.073140	0.063178	–1.157692	0.2481
R-squared	0.998096	**Mean dependent var**		8.081014
Adjusted R-squared	0.998059	**S.D. dependent var**		1.650608
S.E. of regression	0.072725	**Sum squared resid**		1.343402
F-statistic	26632.88	**Durbin-Watson stat**		2.042327
Prob(F-statistic)	0.000000			

*Estimation method is OLS; standard errors and covariances are White-heteroskedasticity-consistent.

Second estimation implemented with fixed effect model for GDP per capita equation, using the data of all countries in the sample.

Table 6

Results of Fixed Effect Estimation for DEPB with Whole Sample*

Dependent Variable: LnGDPPC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LnINVPC	0.630601	0.024367	25.87976	0.0000
LnDEPB	0.035555	0.046105	0.771160	0.4412
LnDEPB$_{-1}$	–0.019584	0.037427	–0.523264	0.6012
AR(1)	0.686507	0.064856	10.58508	0.0000
AR(2)	–0.161483	0.055255	–2.922520	0.0037
R-squared	0.999796	**Mean dependent var**		9.865532
Adjusted R-squared	0.999763	**S.D. dependent var**		3.811876
S.E. of regression	0.058718	**Sum squared resid**		0.768869
F-statistic	272823.0	**Durbin-Watson stat**		2.062754
Prob(F-statistic)	0.000000			

*Estimation method is GLS (cross section weights), standard errors and covariances are White-heteroskedasticity-consistent. Country-specific fixed effects (constant terms) are not reported.

The fixed effect model estimation results are not considerably different from results of pooled regression. Once more current and lagged values of financial development variables are insignificant in the GDP per capita equation estimation while investment per capita is significant variable (Table 6). These results indicate that although the estimation method change, the ineffectiveness of financial development variable on GDP per capita for entire sample does not change.

In order to implement third estimation for financially less developed countries, the location of threshold should be determined. For the reason that where

exactly the threshold is not known a priori, we applied chow test in fixed effect model estimation for the various levels of financial development variable DEPB. Test results show multiple structural break points. The structural break level of DEPB, where below this level current year BANK has got a significant negative coefficient and above this level significant positive coefficient, is considered as threshold level. The threshold level of DEPB is 0.74 for the twelve years average in our sample. There are twelve countries in our sample whose average DEPB level is below this threshold. These are Nicaragua, Hungary, Ethiopia, Central Africa, Madagascar, Senegal, Uruguay, Egypt, Chile, Brazil, Nepal, and Ecuador in an ascending order.

The fixed effect model estimation results for the countries where the average level of DEPB below the threshold show that, current year DEPB has diminishing effect on GDP per capita with its statistically significant negative estimated coefficient (Table 7). However, one year lagged value of DEPB is not a significant variable for this GDP per capita equation estimation while investment per capita has positive significant effect.

Table 7

Fixed Effect Regression Results of DEPB for Financially Less Developed Countries*

Dependent Variable: LnGDPPC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LnINVPC	0.714941	0.058236	12.27655	0.0000
LnDEPB	–0.057218	0.029462	–1.942076	0.0545
LnDEPB$_{-1}$	–0.032767	0.038525	–0.850550	0.3967
AR(1)	0.661873	0.088576	7.472385	0.0000
R-squared	0.998465	**Mean dependent var**		7.144785
Adjusted R-squared	0.998222	**S.D. dependent var**		1.675429
S.E. of regression	0.070638	**Sum squared resid**		0.474029
F-statistic	20595.62	**Durbin-Watson stat**		2.046848
Prob(F-statistic)	0.000000			

*Estimation method is pooled least square, standard errors and covariances are White-heteroskedasticity-consistent. Country-specific fixed effects (constant terms) are not reported.

The fourth estimation is performed with the countries which have average DEPB level above the threshold. In our sample the countries that are financially developed in terms of DEPB are Sri Lanka, India, Jamaica, Poland, Philippines, Turkey, Slovakia, United States, Spain, Tunisia, Japan, Guatemala, Canada, Germany, Portugal, France, Austria, Oman, United Kingdom and Netherlands. We observe that current level of DEPB has an augmenting effect on GDP per capita for this group of countries. The coefficient for this group (0.312) is significant, positive and bigger than the coefficient (–0.057) for the countries below threshold. So, one can argue that, the increasing effect of DEPB above threshold is much more than its diminishing effect below threshold.

Table 8

Fixed-effect Regression Results of DEPB for Financially Developed Countries*

Dependent Variable: LnGDPPC				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LnINVPC	0.666427	0.033150	20.10348	0.0000
LnDEPB	0.312242	0.095064	3.284558	0.0012
LnDEPB$_{-1}$	0.003988	0.089812	0.044408	0.9646
AR(1)	0.652833	0.078772	8.287663	0.0000
AR(2)	–0.428022	0.079325	–5.395818	0.0000
R-squared	0.998732	**Mean dependent var**		8.631326
Adjusted R-squared	0.998508	**S.D. dependent var**		1.374506
S.E. of regression	0.053098	**Sum squared resid**		0.383432
F-statistic	26770.28	**Durbin-Watson stat**		2.105907
Prob(F-statistic)	0.000000			

*Estimation method is pooled least square and, standard errors and covariances are White-heteroskedasticity-consistent. Country specific fixed effects (constant terms) are not reported.

The previous year of DEPB does not seem to have effect on GDP per capita with statistically insignificant coefficient while investment variable has again significant positive coefficient.

When we compare the results of estimation using DEPB variable with the results using FDEPTH, one can argue that current value of both FDEPTH and DEPB do not have positive effect on GDP per capita below the threshold levels. The negative coefficient (–0.37) of current year FDEPTH below threshold is larger than the negative coefficient (–0.05) of current year DEPB below threshold. So one can argue that the negative effect of BANK below threshold is relatively small. Additionally, above threshold namely in the financially developed countries, we observe that one year lagged values of the FDEPTH have positive significant effect, whereas in the case of DEPB the current values are positively associated with GDP per capita. The positive effect of DEPB with the coefficient of 0.31 is larger than the coefficient of 0.22, and hence, the effect of one year lagged values of FDEPTH.

Conclusion

For the reason that in the policy agenda of many countries financial liberalization and financial deepening is favoured, it is necessary to clear out the effect of financial development policies. With this aim, panel-data analysis for a set of 32 developing and developed countries for the period of 1990 – 2001 is performed to investigate the effects of financial development on growth. One of the major finding of our study is the differential effect, depending on its level, of financial development on GDP per capita. By way of performing structural break tests, one comes up with a threshold level of financial development, segmenting

the overall sample into two distinct subsets of financial development. Mainly four estimations are performed, with the first and the second being pooled and fixed-effect regressions, respectively, for the overall group; the third, fixed-effect regression, for the financially less-developed group; and, the fourth, fixed-effect regression, for the financially developed group.

Another important conclusion of this study is that there is positive relation between growth and financial development above certain threshold level irrespective of the financial indicators chosen in the study. Estimation results evince that below the threshold level, current-year financial development has got a negative effect on GDP per capita for two different types of financial development indicators. However, above the threshold, current year DEPB and one year lagged value of FDEPTH have positive effect on GDP per capita. As far as the relative importance of the different financial indicators on growth concerned our study shows that, positive effect of the current value of DEPB variable is larger than positive effect of previous year's FDEPTH. We should also stress that the negative effect of DEPB is relatively small compared to its positive effect. So we can argue that the pro-growth effect of DEPB is more instant and effective while its cost namely its negative effect is less.

There are several theoretical justifications for the differential effect that we propose. Concerning the low levels, the importance of economies of scale in the process of allocating savings to projects with higher rates of return is argued. One argument is based on the assumption that projects with higher rates of return have minimum size requirements and are indivisible (Acemoglu and Zilibotti, 1997). According to another framework, when the size of financial development grows from low to high levels the scale of risk diversification and liquidity services increases. When the firms have more opportunity to diversify risk and to have liquidity, they shift to the projects with higher returns. So the higher is financial development, the higher will be productivity and output. Moreover, there are some arguments to maintain the negative effect of financial development in the low levels.

According to Berthelemy and Varoudakis (1996, p. 80) when the level of financial development is low the expenditures for enlarging financial sector consume resources without creating any effect to improve efficiency and to increase investment volume.

Therefore, in the light of our study we can suggest that the governments should be patient to obtain positive effects of financial development because of the threshold effect suggested by our empirical results. Policy makers should also be watchful for the negative effects of financial deepening for the low levels. Accordingly, we can suggest that economies should not stay in low levels of

financial development for long periods. Finally, the positive effect of two different indicators of financial development above thresholds, points out the pro-growth effects of different channels of financial development. Therefore, governments while enlarging financial system should also take action to support the importance of deposit money banks relative to central bank in the system. Especially, according to our results, the more quick and significant effect of deposit money bank variable (DEPB) emphasizes the importance of financial services provided by deposit money banks.

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