Financial Sector Development and Industrialization

in Cameroon (1970-2014)

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Abstract: There is a given stark discrepancy between financial development in rich and poor countries which has led to numerous empirical and theoretical works that have stressed on the contribution of the financial sector in economic development. For developing economies, while many researches have focused on the linkage between financial development and economic growth, not much has been done to examine the link between financial development and industrial growth. The proposed study examines the causal relationship between the financial sector development and industrialization in Cameroon. Based on the aggregate production framework and Autoregressive Distributed Lag (ARDL) cointegration technique for Cameroonian time series data from 1970-2014, the paper establishes a cointegration relationship between the financial sector development data and industrial output data. The aim of this study is to provide some empirical evidence on the causality relationship between financial development and industrialization in a developing country. Our findings confirm the outcomes of some scholars, who found that financial development impacts the investment, hence the industrialization. We found that for Cameroon, nominal deposit rate influences the industrialization both in the short run and in the long, while the impact of bank deposits is just seen in the short run.

Key words: financial development; industrialization; ARDL; Cameroon

JEL codes: O55, L60

1. Introduction

For more than four decades, Cameroon is still struggling in the pathway of industrialization. The present challenge is to move from the state of natural resources based exports to industrial goods exports. As Gui-Diby & Renard (2015) noticed, there is a high probability that the necessity for increasing the industrial level of African countries may be able to lessen the negative effects from the dependency on primary goods and therefore augment household consumption hence the demand for intermediate products and cause to change the drivers of economic growth.

Across Development Studies Literature, there is an abundance of researchers mitigating that industrialization is a pathway to economic development and growth. In developing countries, the reality is that the inefficiency of the financial sector is responsible for the negative effects on industrial production. Financial sector development and industrialization are closely related. The studies of different scholars established a link between those two

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concepts. Schumpeter (1912), founder of this work, was followed by the wide scholarly research outcomes of Mckinnon (1973) and Shaw (1973) on financial development and economic growth. They view is that financial deepening and savings enhance investment, thus influence in a positive way the economic growth. Here we argue that, this influence is throughout the investments in the industrialization. Robinson (1962) and Stiglitz (1994) concerns on whether the financial system, while enhancing the economic development, will also raise the need for more financial services, thus the development of more advanced financial sectors.

According to the demand-side hypothesis, the bidirectional causal relationship between financial development and economic growth might also be verified with the industrial growth; with an increase of the real output in the economy, there is a need of more financial services (Demetriades & Hussein, 1996; Neusser & Kugler, 1996; Liang & Teng, 2006; Zang & Kim, 2007; Odhiambo, 2008). Therefore, the emergence of the economy requires an important and very effective financial system. The importance of financial sector can be perceived through the interest rate. McKinnon (1973) and Shaw (1973) made the hypothesis according to which, liberal interest rate regime encourages savers to withdraw some of their savings from unproductive real assets to financial assets and by so doing increase the supply of credit in the overall economic system. The added credit will give to the investors the potentiality to boost the industrial output, thus the economic growth. According to Feyzioğlu, Porter, and Takáts (2009), the liberalization of interest rate increases the cost of capital, which raises the return on savings; this will allow even small banks to better do their intermediation. Also, economists such as Schumpeter in 1911 said that banks are institutions which ease technological innovation through their intermediary role (King & Levine, 1993). He pointed the necessity for the banks to efficiently allocate the savings through identification and funding of entrepreneurs with the best chances of successfully implementing innovative products and production processes are tools to achieve this objective. Thus efficiency of investment is increased.

Most developing countries went to various stage of transformation of their financial system. The reforms were to find the right financial system to perform in order to promote high economic growth rate. For example, Odhiambo (2009) carried a study on Zambia which shows that interest rate liberalization was positive for financial deepening and hence economic growth. No priori reason can convince that it may be the case for Cameroon. While this paper goal is to show the impact both in the short run and in the long run of financial sector development variables on industrial production, empirical evidence based on data of Cameroon is given. The rest of the paper will present a brief literature review elucidating the impact of financial development on industrialization; while the last part will present the methodology which contains an overview of the data used and the econometric estimation. After the result interpretation, the conclusion will be given with some recommendations will be included.

2. Literature Review

Prior asserting what is the financial sector development, it is important to define the financial system. Financial system comprises a set of instruments, markets and institutions along with regulatory and legal framework that allows the flow of money to make easier the realization of economic activities. The financial system is responsible to provide investment and capital allocation information, to supervise investment, to increase the gross output, to gather savings and enhance the trade of goods and services. Hence, financial sector development can be explained as the betterment of all these services. As utter by FitzGerald (2006), this development call for the It involves the formation and expansion of such instruments, institutions and market that promote investment and economic growth. According to the International Monetary Fund Staff (2005), a mature

financial system provides various financial services to the whole economy.

Industrialization is the socio-economic transformation of an economy from an meaningless manufacturing activities stage to a more advanced comprehensive one encompassing other types of labor and production (Naude, Szirmai & Lavopa, 2013). It is translated by the growth of the size of the manufacturing outputs in respect to the other components of the whole economy. For this purpose, an important development of the manufacturing sector in comparison to other sectors should be done so that the nation's industrialization can be realized rapidly (Gui-Diby & Renard, 2015). According to the above definitions, to make steady progress in the industrialization pathway, two elements are mandatory: the promotion of the manufacturing sector production and the sustainability of this production so that it can supply both the local and the international markets.

It is known that Africa industrialization level is among the backward ones with an average annual industry growth rate less than 5 percent between 1991 and 2015. At the same time, other regions except the Latin America and the Caribbean, had experienced significant higher industrial development growth rate compare to the Sub-Saharan Africa. This low growth rate of the industrial sector output in SSA countries is mainly attributable to skills, infrastructure and more importantly poor investment climate (Page, 2012). To a greater extend, this critical unavailability or mismanagement of local capital to finance the industrialization process and to create value added production represent a serious challenge for Africa countries.

There are a lot of researches on financial development and economic growth based on countries specific data. Hasan et al. (2009) carried out a research on the impact of financial and legal institutions on economic growth rates using the Chinese provinces data. They found that amelioration of political pluralism, legal environment and financial market have strong influence on the Chinese economic growth. Also, Yang and Yi (2008) used data of Korea to establish the causal relationship between financial development and economic growth. In the case of Korea, their results highlighted an unidirectional relationship between the two variables used suggesting suggest that financial development causes economic growth but not viceversa. Masih et al. (2009) also reached to the same conclusion (unidirectional relationship) by performing long run structural modeling to test the causality between financial development and economic growth using Saudi Arabia's data. Those scholars came to the idea that the link between financial development and economic growth is mainly supply-leading instead of demand side effects. The study of Zhang et al. (2012) gathered 5 years data from 2001-2005 of 286 cities of China to analyze the relationship between financial development and economic growth. Based on the first-difference, cross-sectional regression and GMM estimation methods, the study proved that financial development and economic growth at the cities level in China are positively related. Conversely, Singh (2008) conducted a time series analysis for Indian economy with data from the period of 1951 to 1996 and the results showed bidirectional causality between financial development and economic growth of India.

The existence of a relationship between the growth rate of an economy and its financial structure is an old debate. On the one side, Bagehot (1873) and Hicks (1969) argue that the UK's financial system was an important part of the realization of its Industrial Revolution. Bencivenga and Smith (1991) argue that intermediation creates liquidity and at the same time funds long-lived projects. For instance, Hicks (1969) and Bencivenga, Smith and Starr (1995) discuss that the UK Industrial Revolution was successful due to the high flow of liquidity from capital markets. In the early stage of the Industrial Revolution, the products produced were those that had been invented some time before but lack of long-term finance delayed their manufacture. Through liquidity capital markets, savers financed the projects. Using US data, Rajan and Zingales (1998) found the industries which benefited of external finance and analyzed whether those ones will grow faster in countries with better developed

financial systems. Their conclusion is that there is a positive correlation between growth rates and financial development, suggesting that finance is important for growth. At the firm level, Demirguç-Kunt and Maksimovic (1996) analyzed the data from 30 countries and found that access to stock markets leads to faster economic growth.

McKinnon (1973) and Shaw (1973) instigated the topic of financial liberalization after the revision of its hypothesis, namely the relation between interest rate and economic growth. The debate on the effectiveness of interest rate liberalization was raised from the theoretical and empirical frontiers. McKinnon (1973) and Shaw (1973) supposed that with a liberal interest rate regime, savers are encouraged to turn out some of their savings from unproductive real assets to financial assets and by so doing increase the supply of credit in the economy. They argue that by doing so, financial deepening and savings are impacted, then more investments are realized and thereby economic growth rate increases. In the same way, Ndebbio (2004) and Abiad, Oomes and Ueda (2004) underpinned this idea in their work. Feyzioğlu, Porter, and Takáts (2009) corroborate with the point that interest rate liberalization raises the cost of capital, increases the return on savings, and give an opportunity to smaller, more efficient banks to be more present in the whole financial intermediation process. Thus, efficiency of investment is increased. In the case of Kenya, Ngugi and Kabubo (1998) investigate the sequencing and actions done during the liberalization process. While focalizing on interest rate levels, spreads and determining factors, as an indicator of financial sector response to the reform process, they found that the financial system was marked by repression factors including negative real interest rates, inefficiency in financial intermediation and underdeveloped financial markets. In their conclusion, they said that the economy is encountering secondary financial repression, so there is the necessity to implement some policies that will lead to significant positive effects of financial liberalization. Many views against the impact of interest rate liberalization through savings and investment flourished. Some of those ideas may positively or negatively affect the volume of savings. The decrease of savings means a decrease of investment, and then the output of industries will fall as well, leading to the decline of the economic growth.

The critics of interest rate liberalization hypothesis are Giovannini (1983), Arrieta (1988), Cho and Khatkhate (1990), Warman and Thirwall (1994) and Bandiera et al. (1999) among others. They argue that high interest rate will increase the opportunity cost of consumption; household will substitute part of their consumption for savings, hence savings will increase. Omole and Falokun (1999) believe that interest rate liberalization is unfavorable for industrial operations and therefore economic development. Therefore, they ask that complementary regulations such as tax reliefs, reduction in tariffs and provision of basic infrastructural facilities will help to implement industrial incentives. Japelli and Pagano (1989, 1994) and Hall (1978) distinctly proved that even when the oncome level is high, financial reforms still target to slow down borrowing tend to induce consumption more than savings.

In their work, Abdul and Ying (2008) used bound test method (ARDL) to cointegration with deposit liability ration (DLR) and credit to private sector (CPS) as proxies to financial development. They conclude that the impact of DLR and CPS on economic development in Pakistan is significant, but in China DLR is positive and significant while CPS is positive but insignificant.

3. Methodology

3.1 Methodology
To reach the goal of our study on the on the impact of financial sector development on the growth of the

industrial sector in Cameroon, we use the aggregate production framework proposed by Fosu and Magnus (2006) and Constant and Yaoxing (2010). The aggregate production framework is an extension of the conventional production function, which emphasizes labour and capital as the main factors of production. Following is the general form of the function linking aggregate output in t period with inputs or factors of production:

$$Y_t = A_t K_t^{\alpha} L_t^{\beta} \tag{1}$$

Where: Y_t refers to the aggregate production of the industrial sector at time t, and A_t, K_t, and L_t are the total factor productivity (TFP), respectively the capital stock and the stock of labour at time t. The wide scholarly research outcomes of Mckinnon (1973) and Shaw (1973) on financial intermediation and economic growth argue that financial deepening and savings, increase investment, thus have a positive influence on economic growth. This study assumes that the mentioned influence is through investments in industrial sector. At the difference of the analysis of Elijah et al. (2012) on the case of Nigeria, beside the assumption that, the TFP is a function of financial depth (FIN), nominal deposit rate (NDR), and other exogenous factors (C), banks deposits (BD) and domestic credit to private sector (CPS) are also included in this study. Therefore, the total factor productivity model is:

$$A_t = f (FIN_t, NDR_t, BD_t, CPS_t, C) \tag{2}$$

We rewrite Equation (2) explicitly as:

$$A_t = FIN_t^{\varphi} NDR_t^{\lambda} BD_t^{\sigma} CPS_t^{\tau} C_t \tag{3}$$

Then, replacing Equation (3) in (1), we obtain:

$$Y_t = C_t K_t^{\alpha} L_t^{\beta} FIN_t^{\varphi} NDR_t^{\lambda} BD_t^{\sigma} CPS_t^{\tau} \tag{4}$$

The linearization of Equation (4) gives the following explicit estimable econometric model:

$$lnY_t = c + \alpha lnK_t + \beta lnL_t + \varphi lnFIN_t + \lambda lnNDR_t + \sigma lnBD_t + \tau lnCPS_t + \xi_t \tag{5}$$

Where all coefficients and variables are as defined earlier, c is a constant parameter and ξ is the white noise error term.

The study adopts the bounds testing cointegration procedure to estimate the long run and short run relationships and dynamic interaction among the variables of interest. Pesaran et al. (2001) proposed an Autoregressive Distributed Lag (ARDL) bounds testing approach to investigating the existence of cointegration relationship among variables. There are three specific advantages associated with this approach:

(a) It circumvents the problem of the order of integration associated with the Johansen likelihood approach (Johansen & Juselius, 1990).

(b) Unlike most of the conventional multivariate cointegration procedures, which are valid for large sample size, the bounds test approach is suitable for small sample size study (Pesaran et al., 2001).

(c) It provides unbiased estimates of the long run model and valid t-statistics even when some of the regressors are endogenous (Harris & Sollis, 2003). The following ARDL model will be estimated in order to test the cointegration relationship between the variables: Interest rate, financial depth, industrial output, labour and capital stocks.

In this study, for our econometric estimation, the annual time series data covering the period of 1970-2014 was gathered from mainly the World Bank data base and the International Financial Statistics (IFS) Yearbooks published by the International Monetary Fund. Following is a brief description of those data:

- Industrial output (Y) refers to the gross domestic product of the industrial sector as a percentage of GDP.
- Capital stock (K) is measured as the gross fixed capital formation.
- Labour stock (L) refers to the total workers employed.

- Financial depth variable (FIN) is the broad money stock (M2) divided by the gross domestic product (GDP).
- Nominal deposit rate (NDR) is the deposit interest rate in commercial banks.
- Bank deposits (BD) is the percentage of bank deposits to GDP.
- Domestic credit to private sector (CPS) is percentage of the credit given by domestic bank to GDP.

3.2 Empirical Results and Findings

The Augmented Dickey Fuller (ADF) test for the stationarity of each variable reveals that none of them is I(2) as shown on Table 1. Our variables satisfied one of the key preconditions of the ARDL test. The test on the existence of any recursive residuals shows that there is not issue of recursive residuals in terms of mean (in first CUSUM chart) and in terms of variance (in second CUSUMSQ chart). Once a long run cointegration relationship is established, Equation (5) was estimated. The results obtained by normalizing on industrial production (Y) in the long run are reported in Table 2.

$$\ln Y_t = -769.0889 - 0.0951\ln K_t + 52.3688\ln L_t + 2.1313\ln FIN_t + 1.2637\ln NDR_t - 2.2256\ln BD_t + 0.7108\ln CPS_t \quad (6)$$

Table 1   Augmented Dickey Fuller (ADF) Test Results

Variables	AIC lag	Constant	ADF	Variables	AIC lag	Constant	ADF
lnY	1	-2.0202	I(1)	ΔlnFIN	4		I(1)
ΔlnY	1		I(0)	ΔΔlnFIN	4		I(0)
lnK	1	-0.42217	I(1)	LnNDR	1	-2.1731	I(1)
ΔlnK	1		I(0)	ΔlnNDR	1		I(0)
lnL	2	-11.099	I(1)	LnBD	3	-2.3453	I(1)
ΔlnL	2		I(1)	ΔlnBD	1	-2.2430	I(1)
ΔΔlnL	2		I(0)	LnCPS	2	-0.9887	I(1)
LnFIN	4	-2.0059	I(1)	ΔLnCPS	1	-0.9839	I(0)

Table 2   Estimated Long Run Coefficients Using the ARDL Approach

Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,0,0,0,1,0,0) selected based on Akaike Information Criterion

Dependent variable is LNY

44 observations used for estimation from 1971 to 2014

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
LNL	52.3688	39.5339	1.3247[0.194]
LNK	-0.095194	0.22037	-0.43198[0.668]
LNFIN	2.1313	1.2291	1.7340[0.092]
LNBD	-2.2256	1.0651	-2.0897[0.044]
LNNDR	1.2637	0.40625	3.1106[0.004]
LNCPS	0.71083	0.47096	1.5093[0.140]
C	-769.0889	580.3868	-1.3251[0.194]
T	-1.5636	1.2126	-1.2894[0.206]

Testing for existence of a level relationship among the variables in the ARDL model

F-statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
1.0816	3.2501	4.6153	2.7957	3.9860
W-statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
7.5710	22.7509	32.3072	19.5698	27.9022

Note: If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

In the long run, lnNDR is the only significant variable. The estimated coefficients of the long run relationship show that industrial output is considerably explained by the nominal deposit rate (NDR). Capital stock and the broad deposit have a negative sign contrary to the other variables in this case.

The result of the short run dynamic coefficients associated with the long run relationship is obtained from the ECM equation as reported in Table 3. The error correction model for the short run estimates ECM(-1), which is the most important parameter, negative and significant at 5% level and between 0 and -1 , it is -0.25912. The short run equation is reported as:

$$\Delta lnY_t = -769.0889 - 0.024667\Delta lnK_t + 13.5699\Delta lnL_t + 0.55227\Delta lnFIN_{t} + 0.32745\Delta lnNDR_t - 0.88781\Delta lnBD_t +$$
$$0.18419\Delta lnCPS_t - 0.25912ECM(-1) \quad (7)$$

Table 3   Estimated Short Run Coefficients Using the Error Correction Representation

Error Correction Representation for the Selected ARDL Model
ARDL(1,0,0,0,1,0,0) selected based on Akaike Information Criterion
Dependent variable is dLNY
44 observations used for estimation from 1971 to 2014

Regressor	Coefficient	Standard Error	T-Ratio [Prob]
dLNL	13.5699	8.7434	1.5520 [0.130]
dLNK	-0.024667	0.058357	-0.42269 [0.675]
dLNFIN	0.55227	0.22823	2.4198 [0.021]
dLNBD	-0.88781	0.27856	-3.1871 [0.003]
dLNNDR	0.32745	0.10074	3.2505 [0.003]
dLNCPS	0.18419	0.11253	1.6369 [0.111]
dT	-0.40515	0.26919	-1.5051 [0.141]
ecm(-1)	-0.25912	0.091827	-2.8219 [0.008]

ecm = LNY -52.3688*LNL + 0.095194*LNK -2.1313*LNFIN + 2.2256*LNBD -1.26
37*LNNDR -.71083*LNCPS + 769.0889*C + 1.5636*T

R-Squared	0.45067	R-Bar-Squared			0.30527
S.E. of Regression	0.072390	F-Stat.	F(8,35)	3.4868[0.005]	
Mean of Dependent Variable	0.011295	S.D. of Dependent Variable			0.086850
Residual Sum of Squares	0.17817	Equation Log-likelihood			58.7693
Akaike Info. Criterion	48.7693	Schwarz Bayesian Criterion			39.8484
DW-statistic	1.9058				

R-Squared and R-Bar-Squared measures refer to the dependent variable
dLNY and in cases where the error correction model is highly restricted, these measures could become negative.

Testing for existence of a level relationship among the variables in the ARDL model

F-statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
1.0816	3.2501	4.6153	2.7957	3.9860
W-statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
7.5710	22.7509	32.3072	19.5698	27.9022

Note: If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

In the short run, the coefficients of InBD and lnNDR are significant. The coefficients of capital stock and the broad deposit remains negative even in the short run model the adjusted R-squared reveals that 45 percent of the variation of industrial output is explained by the banks' deposits and nominal deposit rate. Despite significant at 5%, the bank deposit has a negative impact on industrialization in Cameroon. This adverse effect could be the result of the dependence of the financial system to foreign decision makers. Additionally, the short run dynamic

model passes all short run diagnostic tests for no serial correlation; no conditional autoregressive serial correlation and error term is normally distributed. The cusum squares test for model stability is equally satisfactory and presented in Figure 1.
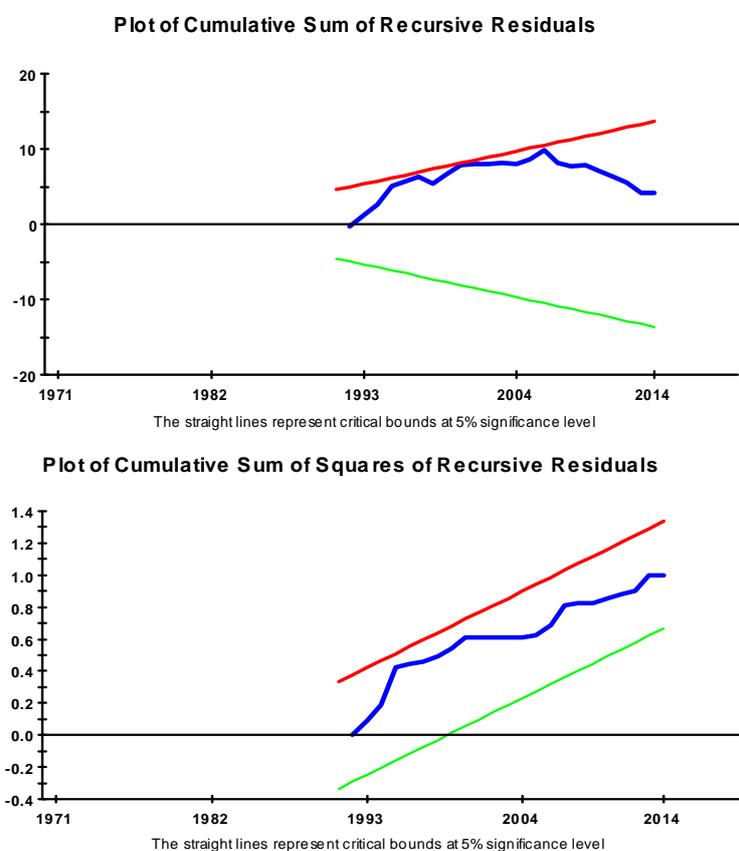
Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level

Figure 1   Plots of the Cumulative Sum

4. Conclusion and Recommendations

This paper examined the SCM practices of electronic firms and automotive manufacturers in China. What is noted in this study is that Based on the Autoregressive Distributed Lag (ARDL) Cointegration approach, this study establishes the impact of financial sector development to industrialization in Cameroon. Our findings confirm the outcomes of some scholars, who found that financial development impacts the industrial output. We found that Cameroon, nominal deposit rate influences the industrialization both in the short run and in the long, while the impact of banks deposits is just seen in the short run.

The policies makers should implement policies that will boost the gross capital formation in Cameroon. Nominal deposit rate has fallen drastically. The Government invisible hand can act so that banks provide more attractable deposit interest rates to attract more individual to open a bank account. Increasing individual income will also increase the savings. Cameroon financial authorities could lower the tax on the banks' net income that is very high in Cameroon (40%). The reform of financial institutions and regulations in Cameroon is important, for a more efficient domestic financial sector, which is a pre-requisite for the achievement of industrial development. The issue of money supply could lead to another key research issue that is to study the impact of the French

currency XAF on the overall economic development in Cameroon. Additionally, industrialization requires a lot of innovations and entrepreneurship. To achieve these, appropriate policy should be undertaken. For development countries in general, the most significant is for government to generate policies that define the rule of the game and bring into existence incentives to promote economic interactions. These policies can consist to improve the quality of the financial institutions in the each nation.

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