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Financial Deepening and Economic Growth in Hong Kong: An ARDL Approach

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Abstract

The Hong Kong economy has been able to maintain consistent growth for a longer period of time under market mechanism. On the financial development front country has performed well and occupied the financial capital status of Asian region. Even the recent concept of offshore local currency bond (dim sum bonds) launch of China is mostly facilitated by Hong Kong due to proven capabilities on financial performance. Theoretically, the healthy financial system creates the massive scope for economic growth and development however empirical findings are yet to confirm the argument. In this regard, the present study tries to identify the impact of financial deepening on economic growth of Hong Kong. The ARDL bounds-testing approach confirms that there is the short-run as well as long-run relationship between financial deepening and economic growth in Hong Kong economy.

Keywords: Financial deepening, economic growth, principal component analysis, ARDL bounds test approach.

Introduction

The adverse consequences of recent global financial crisis have been very well pronounced worldwide. This crisis has intensified the discussion for diagnosing the behavior of financial system and its contagion effect in an economy. Moreover, the development economists have frequently expressed their views about the role of financial sector in addition to the primitive inputs such as labor force and technological progress in determining the economic growth. It is evidenced that financial system mobilizes the individual's savings, overcomes the asymmetry of information ex-ante and principal agent problem ex-post, ameliorate the liquidity risk, facilitate in risk diversification and provide ease in transactions (Levine, 1997). The role of financial system in economy is extended towards the accumulation of capital and strengthening the technological capabilities.

Hong Kong is considered the most promising industrial state of the world. Hong Kong launched the economic reforms in early 1970s targeting major segments of the system for overall economic development. The economy witnessed improved growth after mid of 1970s as it had attained the growth rate of 12 percent during 1976-80. The expansion of textile and clothing had been the key characteristics of the economy in late 1970s (Cheng, 1984). In early 1980, Hong Kong

had faced the problem of protectionism, peripheral competition and rising labour cost, but diversification nature of the economy at that time proved to be very beneficial (So, 1986). On the financial front, Hon Kong banking system had been regulated by strict administrative direct control like interest rates, licensing for new entrants etc. With the expansion of the economy in later 1970s, Hong Kong felt the need of developed financial system to cater the growing demand of credit for profitable projects. In this process major financial sector reforms were put in place with the target of deregulating the interest rate, creating a healthy competition among private players, effective monitoring, etc. As a result, there was the rapid expansion of financial sector with the number of banks has increased from 431 in 1970 to 1043 in 1980. In late 1970s, Hong Kong had attained the status of financial capital of Asia, and third largest financial centre of the world preceded by New York and London (Chung, 1983). Opting Hong Kong as the world centre instead of Japan and Taiwan was the outcome of its liberal state policies. These policies were characterized with free flow of international funds and no discrimination against foreign operators. Further, it led to drastic increase in the number of foreign licensed banks in the city. The liberal policies of the economy were proved sound for the economy as significant amount of funds had flowed in the system by international investors. Initially the funds were channeled towards the real-estate but later on the high liquidity generated from the sale of property facilitated the construction of massive infrastructure projects which accompanied its export industrialization structure (So, 1986). In light of this information, it can be argued that one of the functions of the financial system, transmitting the funds towards profitable projects, had been watched over way back in the early 1980s. It puts forth a motivation to us to identify the other roles (mentioned earlier) of the financial system in the ongoing economic environment. Moreover, Hong Kong economy, which is characterized as open market driven economy, has been able to maintain consistent growth for a longer period of time. In recent years, the economy has procured the growth rate of 5 to 6 percent. It gives an immense opportunity to empirically examine the importance of financial system in sustaining such high growth trajectory and more importantly draws our attention in finding the relationship between financial deepening and economic growth in the environment of market generated activities.

Economic Performance of Hong Kong

The growth performance of Hong Kong economy had been very impressive as economy maintained the average growth of 13 percent in GDP during 1960-65. However a halt in growth performance had been witnessed during 1965-76 with growth figures were to the tune of 7 percent. With significant jump during 1976-80, the economy again maintained the growth around 7 percent till late 1980s. But economy had witnessed the great impact of Asian financial crisis of 1997-98 as the growth momentum was broken out and economy reached to the minimum growth of less than 3 percent by late 1990s. Since then the growth performance has improved. The country has consistent saving behavior which helped to realize the investment goals as reflected through stable capital formation for past couple of decades. Country has performed well on external front with surplus current account balance and significant capital inflows. In the recent past (2011-15) the economic fundamentals have noticed decline compared to previous period. In fact the impact of recent global financial crisis is also visible in Hong Kong economy.

Financial Development Profile of Hong Kong

Financial Development Index (FDI) [1]is compiled by World Economic Forum, published under Financial Development Report 2010. [2] As per the report first ranks are secured by US and UK because these are the most developed countries along with the developed financial systems comprising various innovative financial products. However some Asian economies also occupied better rank as Hong Kong and Singapore attained third and fourth position, respectively in overall ranking of FDI of 52 countries. There is significant improvement in the ranking of Hong Kong economy in 2009 compared to the tenth rank in year 2008. The higher rank means the growth of almost all the seven pillars of financial development, but the strongest improvement for Hong Kong is observed in the financial intermediation particularly derived from its efficient banks, initial public offer and mergers and acquisition activities.

Table 1 : Economic Performance of Hong Kong

		Percentage of GDP			
Year	**GDP Growth***	**GFCF**	**GDS**	**CAB**	**FDI**
1960-65	13.0	34.2	24.3	-	-
1966-70	6.7	19.5	24.9	-	-
1971-75	7.7	22.6	29.4	-	-
1976-80	11.7	26.6	33.5	-	-
1981-85	5.8	26.2	31.6	-	-
1986-90	7.8	24.4	36.0	-	-
1991-95	5.2	27.9	32.6	-	-
1996-2000	2.7	29.2	30.4	4.0	20.2
2001-05	4.3	22.9	31.5	9.3	21.8
2006-10	4.0	22.1	31.2	11.5	14.9
2011-15	3.0	23.8	25.4	2.7	12.7

Source: Compilation from WDI and IFS, Note: * Real GDP (US$)

This report also highlighted the ranking for different pillars of financial systems. In case of institutional environment, Hong Kong secured 10th position among the 52 countries. It stood at third position in both dimensions such as business environment and financial intermediaries dimension particularly in banking sector. From financial stability front, the country achieved 2nd position in contrast to the United States and United Kingdom whose respective positions are 39th and 46th respectively, clearly indicating financial instability in these developed economies. For the financial market dimension, top position is achieved by USA, while Hong Kong maintained 5th position. The seventh and last pillar of financial systems is related to size, depth and access of financial systems. In this pillar the country is dominating among the Asian countries with 2nd rank. The index was again compiled in 2013-14 with broader dimensions of financial system, and Hong Kong occupied the 9th position (as compared to 8th position of Japan) above than other giants such as Germany and Singapore. [3]This remarkable performance of financial system of Hong Kong gives a motivation to examine the relationship between financial deepening and economic growth. The study is organized as follows: the next section briefly reviews the theoretical and empirical literature related to financial development and economic growth. Third section describes the methodology used in the study. Fourth section discusses the empirical findings of the study and finally concludes the discussion.

Review of Literature

In recent years a vast amount of literature has emerged who tried to highlight the theoretical rational of financial system in real economy, and also quantified the relationship between financial development and economic growth for various reasons. Schumpeter (1912) argued that well-functioning banks are able to finance the profitable investment projects. Gurley and Shaw (1955) highlighted the investment efficiency role of financial intermediaries. The efficient allocation of investment leads to increase in returns to capital and so increases the capital accumulation as well as savings. McKinnon and Shaw (1973) pointed out the financial liberalization aspect and contended that high interest rate induces the savings that increases the volume of investment and hence influences the growth. Such benefit is found missing in financial repression system of interest rate ceiling as it rations the credit. Greenwood and Jovanovich (1990) had observed the capital accumulation role of financial system. Financial system primarily facilitate in transmitting the savings from households to productive units, acquiring information about profitable investment projects ex-ante, monitoring and exerting corporate control ex-post, diversifying the risk and easing transactions (Levine, 1997). Besides, some models focused on the role of financial system towards management of liquidity risk (Diamond & Dybvig; 1983).

Various empirical studies have been carried on to identify the relationship between financial development and economic growth. Goldsmith (1969) concluded that the developed financial system particularly financial intermediaries explain the economic growth. The flood of empirical studies to test the relationship in same line came into existence in 1990s. King and Levine (1993) had been one of the prominent studies of this period. They concluded that various measures of financial development is positively associated with the economic growth. Also, it was found that the predetermined component of financial development is a good predictor of long-run growth over the next 10 to 30 years. Moreover, higher level of financial development is strongly associated with future rates of capital accumulation and future improvements in the efficiency with which economies employ capital. It was interpolated that finance not only follows the growth but predicts long-run economic growth also.

Further, King and Levine (1993b) gave emphasis on the productivity growth and capital accumulation role of financial development. They concluded that there is significant relationship between the financial development measures and long-run per-capita growth, capital accumulation and productivity growth. Focusing on investment hypothesis of financial development, Gregorio and Guidiotti (1995) argued that the transmission from financial development to economic growth is because of efficiency, rather than the volume of investment. Further, empirical studies focused on stock market developments and contended that there is close relationship between the stock market and banks, non-bank financial institution, pension funds and insurance companies (Demirguc¸Kunt & Levine; 1996a, 1996b). Also it was argued that predetermined component of stock market development is positively and robustly related with long-run economic growth (Levine & Zervos; 1996). Levine & Zervos (1998) found an important empirical relationship between stock markets and economic growth. They concluded that stock market liquidity and bank development are positively and significantly correlated with economic growth, capital accumulation and productivity increment.

Research Methodology

Data and Resources

To investigate the relationship between financial deepening and economic growth for Hong Kong, annual time series data is used. The sample period of the study ranges from 1990 to 2008 based on the consistent availability of data for the financial indicators. Existing literature give due weightage to both dimensions viz. institutional and market-based environments for measuring the financial development. In financial system the financial instructions and financial markets work as complimentary of each other.

The financial markets play a crucial role in ameliorating the liquidity risk and facilitate risk diversification. It necessitates including these roles of risk amelioration among the indicators of financial development. These roles are embodied in the market size, market activity and market efficiency. The present study has quantified the financial deepening by considering the various dimensions of both the environments. These dimensions of financial development are discussed as follows:

On the front of financial institutions, the size of financial intermediaries is measured through the relative figure of liquid liabilities in terms of economy size. Two aspects are important, one is how much credit is extended to the private players out of total credit and second is the size of private credit in the economy. The allocation towards private sector is presumed to have relatively more implications towards the efficient utilization of finance (Levine, 1997). The bank credit to private sector as percentage of GDP measures the activity of financial intermediaries (Beck et al., 1999). The quantity as well quality forms major chunk of financial development. Here two variables PRIVATE (ratio of credit allocated to private enterprises to total domestic credit) and PRIVY (credit provided to private enterprises as % of GDP) are considered.

On financial markets side, the market size is quantified by market capitalization as share of GDP (Levine & Zervos, 1998). Market activities are reflected by, stock traded value ratio (STVR) (value of domestic equities traded on domestic exchange to the GDP income) (Kunt & Levine, 1999). Turnover ratio (TR) (value of trades of domestic equities to market capitalization) captures the efficiency dimension of financial markets. In a nut shell, the present study utilizes liquid liabilities, private credit out of total credit, private credit in relation to GDP, bank credit to private sector, market capitalization, turnover ratio and stock traded values for measuring the financial deepening. An aggregate index is compiled to present the multidimensional data into single variable using the principal component analysis technique. Economic growth is measured through real per-capita GDP. Other controlling variables to the growth models are real gross fixed capital formation an indicator of productive capacities, and trade to GDP ratio a proxy for exposure of economy towards rest of the world. The data sources are World Development Indicators (World Bank) and International Financial Statistics (International Monetary Fund).

Method of Analysis: Auto-Regressive Distributed Lag Model

The co-integration model for estimating the long-run relationship among the select variables was first designed by Engle and Granger (EG 1987) for two variables followed by Johansen & Juselius (JJ 1990) for more than two variables. The key point to note here is that all the variables in the co-integrating regression must be integrated of same order. Moreover, it is not necessary the economic variables to be co-integrated despite the same order of integration. Here we are confronted with major problem is that the economic variables may not be integrated of same order. Also EG and JJ techniques are affected by small sample. In light of these problems autoregressive distributed lag model (ARDL) bounds testing approach to co-integration developed by Pesaran et al (2001) has advantages that it can be applied irrespective of integration properties of the economic variables (either level or first difference stationary) (Pesaran and Pesaran, 1997). Further, ARDL consider sufficient number of lags to capture the data generating process in general to specific modeling framework (Laurenceson & Chai, 2003). Moreover, ARDL technique is far superior than the JJ co-integration technique (Pesaran & Shin, 1999).

Suppose we want to test the co-integration between two variables X and Y. For the purpose, following equation is specified:

$$\Delta Y_i = \beta_0 + \sum_{i=1}^{p} \psi_i \Delta Y_{t-i} + \sum_{i=1}^{p} \phi_i \Delta X_{t-i} + \theta_1 Y_{t-1} + \theta_2 X_{t-1} + \varepsilon_t \quad (1)$$

Where β0 is drift term, Δ is difference operator and εt denotes the white noise.

ARDL approach is two steps process where our first concern is to identify the long-run relationship among the underlying variables using F-statistics and if exists then to estimate the coefficients of long-run relations and make inferences about their values. If the long-run relationship exists then following error-correction model is estimated:

$$\Delta Y_i = \beta_0 + \sum_{i=1}^{p} \psi_i \Delta Y_{t-i} + \sum_{i=1}^{p} \phi_i \Delta X_{t-i} + \alpha ECM_{t-1} + e_t \quad (2)$$

The error correction model result indicates the speed of adjustment back to long-run equilibrium after a short-run shock.

By taking stock of existing literature following model is specified to estimate the relationship between financial development and economic growth.

$$LY = \beta_0 + \beta_1 FDI + \beta_2 LKCAPITA + \beta_3 TR + \mu \quad (3)$$

Where LY is log of real per-capita GDP, FDI is financial deepening index, LKCAPITA is the log of real gross fixed capital formation per-capita and TR is the trade ratio. β0 is the intercept, βs are partial coefficients and μ is the error term.

Results & Interpretation

The study exploited principal component analysis a statistical method for converting the financial development indicators into a composite score.

Financial Deepening in Hong Kong

For Hong Kong economy, the size of financial system had much dominance of financial markets during 1988-92. For

the same period the market capitalization was much above the size of the economy and liquidity was to the tune of half of the GDP (Table 2). The financial institutions were equal partners to shape the financial system as performance of institutions was stagnant. The continuous surge in market performance led to overall development in the financial system. The market size has increased whopping from 190 percent of GDP in the period 1988-97 to whopping 356 percent during 1998-2008, mainly the post crisis period of Asian financial shock. Hong Kong might have learned the lessons from the economic shock and tried hard to make the resilient economy towards such shocks. AN improvement has been noticed in the market liquidity in the post crisis era. However the stock market efficiency could not witness the substantial improvement. For the similar comparison for financial institutions, the depth of had increased significantly, credit allocation to private sector has improved and credit generated by commercial banks had remained stagnant (Table 2).

Table 2: Financial Development Indicators for Hong Kong (Average Values)

Year	MC[1]	TR	STVR[1]	M3[1]	PRIVY[1]	Bank Credit[1]	PRIVATE
1990-92	129.7	42.2	50.7	174.9	142.7	133.4	107.0
1993-97	249.5	57.4	134.9	165.7	151.3	144.7	104.6
1998-2002	306.8	49.2	149.0	221.3	155.2	140.1	110.8
2003-08	398.2	59.0	238.8	278.5	144.1	136.7	105.8
1990-97	189.6	49.8	92.8	169.1	148.1	140.5	105.5
1998-2008	356.6	54.5	198.0	252.5	149.1	138.2	108.1
1990-2008	277.1	52.3	147.9	217.4	148.7	139.2	107.0

Source: Compilation from WDI and IFS 2009,

In order to know the aggregate performance of financial system of Hong Kong, study follows the methodology of Fritz (1984) where PCA is used for examining the financial deepening of Philippines. In the process of computation of index, the present study utilizes three factors based on eigen value criteria which explain 86 percent variance of the communality. In the analysis process, the factor loadings are obtained for different factors. After that the combined score to each of the variable is computed. The combined score is computed while multiplying the weights of respective variables in corresponding factor with the proportion of that factor's Eigen value and then adding for each factor. The weights are obtained with dividing the loadings of respective variable by the sum total of loadings in each factor.

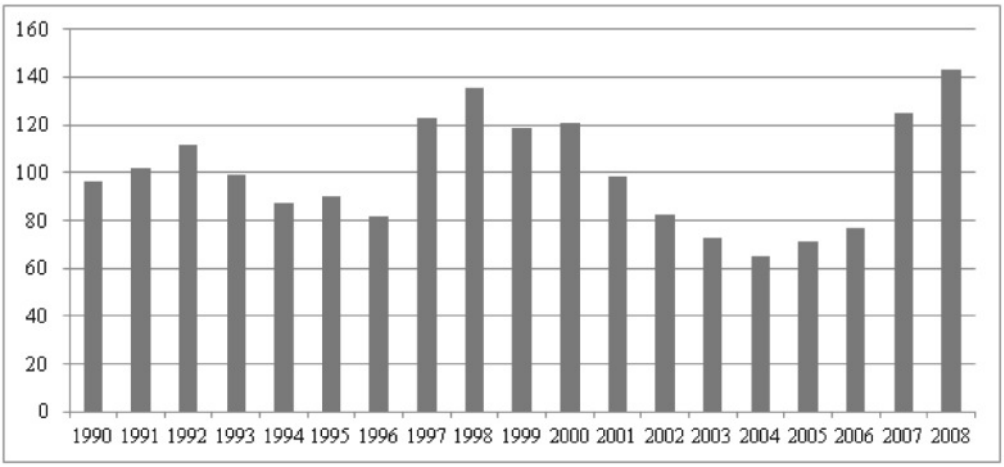
Table 3 presents the relative contribution of financial indicators in the overall index composition. It is observed that private credit out of total credit; financial market efficiency and liquidity hold significant weights of 14.9, 8.1 and 3.7, respectively. The size of financial markets and bank credit hold negative weights implying their movements are not in consistency with direction of other dimensions of financial deepening.

Table 3: Weightage for Financial Development Indicators

Country/Factor	Factor 1	Factor 2	Factor 3	Combined Weight
MC[1]	0.77	0.01	-0.49	-5.86
TR	0.58	0.57	0.32	8.13
STVR[1]	0.93	0.32	0.02	3.66
M3[1]	0.81	-0.04	-0.30	-2.72
PRIVY[1]	-0.26	0.90	0.14	3.43
Bank Credit[1]	-0.41	0.84	-0.33	-4.84
PRIVATE	0.36	-0.05	0.85	14.87
Eigen values (EV)	2.81	1.96	1.28	6.05
EV Proportion	46.50	32.35	21.16	100.0
Proportion of Communality	0.40	0.28	0.18	0.86

Source: Author' Computation

Figure 1: Financial Deepening Index for Hong Kong



Source: Author's Computations.

For the period of 1990 to 2008, the behavior of financial deepening is reflected in figure 1. The country had sound performance in 1992 as index value stood at 112 as compared to average value of 100. In the subsequent four years the level of deepening has seen downfall and reached to lowest level in 1996. The interesting observation is that Hong Kong could manatain the financial deepening even in the Asian financial period. One point to note that Hong Kong's financial deepening is sensitive to the financial markets and every volatility in the market puts the overall performance vulnerable. The index value declined substantially in 2004 mainly caused by volatility financial market. Since 2004 the financial system has deepened as reflected in the improved value of index (Figure 1).

Table 4: Financial Deepening Index for Hong Kong

Year	Financial Deepening Index
1990-92	103.2
1993-97	96.3
1998-2002	111.1
2003-08	92.2
1990-97	98.9
1998-2008	100.8
1990-2008	100.0

Source: Author's Computations.

On an average, Hong Kong's financial system has been resilient to the Asian financial crisis as observed by stable performance before and after the crisis era. It's worth mentioning that the Hong Kong financial deepening level is mainly explained by private credit along with other primitive finance indicators. Herein lays the scope for some sort of improvement in its value for further improvement in the financial deepening level. Another lesson is to have a sound balance in both the environments. Since private credit is important ingredient for financial system, it might have rendered the improved capabilities of firms to add on the output and employment opportunities to the next best level. This is the major enquiry of the study and next section deals whether financial deepening has resulted into the improved economic growth of the country.

Financial Deepening and Economic Growth in Hong Kong

The economy had sustained the high growth rate till mid of 1990s, but the growth was lower for period 1996-2000 might be affected by Asian financial crisis. In the recent past, the economy has secured the improved growth and such performance is considered to be the outcome of economic and financial sector reforms. In this growth journey, the importance of financial development is identified with two fold criteria: one is descriptive analysis; second is diagnosis of relationship between financial deepening and economic growth using specified model. Table 5 presents the behavior of real per-capita GDP and financial development index for Hong Kong in different economic environments. [4] The figures of table 5 does not conform explicit trend pattern between financial deepening and economic growth.

Table 5: Economic Growth and Financial Deepening in Hong Kong

Year	YI[5]	FDI*
1990-1992	7.06	49.24
1993-1996	25.48	31.82
1997-2000	29.05	76.45
2001-2004	43.80	18.91
2005-2008	87.84	50.16

Source: Author's Computations.

[5] YI and FDI* are real per-capita GDP and Financial Deepening Index in scale of 100.

The long-run relationship between financial deepening and economic growth is examined using the Auto Regressive Distributed Lag (ARDL) bounds-testing approach. The first step of the model is to investigate the integration order of the series as none of the series should be integrated of order two or more. In order to check the stationary behavior of the series, Augmented Dicky Fuller (ADF) and Phillips Perron (PP) tests are utilized for intercept model for all variables. The test statistic reported in Table 6 highlights that most of the series are non-stationary in level form while the first difference of the series indicates stationary process. However some series are not stationary in difference form based on ADF criteria, but the other test statistic indicates the stationary behavior of the series.

Table 6: Unit Root Test Statistic for Hong Kong

	ADF Test		PP Test	
Variable	Level	1st Difference	Level	1st Difference
FDI	-2.2960	-1.7758	-1.7632	2.9392[c]
TR	-0.0023	2.3368	0.3342	-2.7789[c]
LY	0.2780	-2.5116	0.1847	-3.3025[b]
LKCAPITA	-2.4360	-3.1469[b]	-2.4107	-3.1728[b]

Source: Author's Computations. Note: a, b, c indicate statistically significant at 1, 5, 10 percent level respectively. FDI: financial deepening index, TR: total trade as percentage of nominal GDP, LY: log of real per-capita GDP, LKCAPITA: the log value of real gross fixed capital formation per capita.

The results of test statistic for diagnosing the long-run relationship among the economic indicators are presented in Table 7. The F-statistic (13.44) exceeds the upper threshold values and hence provides strong evidence of long-run relationship among the specified variables. The direction of relationship exhibits that there is no long-run relationship while considering financial development, trade openness and capital formation as dependent variable. These results suggest that financial development along with the controlling variables trade openness and real investment is the driving force to the per-capita GDP of the Hong Kong economy.

Table 7: Diagnosis of the Long-run Relationship

Functional Form[6]	F-statistic (4,7)
F(LY/FDI, LKCAPITA, TR, D1)	13.4433*
F(TR/LY, FDI, LKCAPITA, D1)	2.5053
F(FDI/LY, LKCAPITA, TR, D1)	2.1446
F(LKCAPITA/LY, FDI, TR, D1)	0.6731

Source: Author's Computations. Note: * indicates significant at 99 % confidence interval.[7]

[6] F(LY/FDI, LKCAPITA, TR, D1) denotes that LY is explained by FDI, LKCAPITA, TR and Dummy of Asian financial crisis period and so on.

[7] The critical values are I(0) = 4.385 and I(1) = 5.615 at the 1 % level of significance (see Pesaran et al.; 2001).

To make the long-run analysis operative, the Akaike Information Criterion is used for the selection of order of ARDL as (1,1,1,0,1). Table 8 exhibits the behaviour of long-run coefficient of select variables. It is found that financial deepening is having positive sign, however not statistically significant at individual level. Trade ratio is statistically significant at 1 percent level with the coefficient value of 0.23. It implies that one unit increase in trade openness leads to 0.23 percent increase in real per-capita GDP in the long-run. Capital formation and dummy variables are insignificant in the model. The estimated ARDL model satisfies the conditions of diagnostic tests of serial correlation, functional form specification, normality and heteroskedasticity (Table 9).

Table 8: Estimated Long-run Coefficients Using ARDL Approach
(Dependent variable LY)

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
TR	0.2325	0.0332	6.9955	0.0000
FDI	0.0006	0.0006	0.9645	0.3540
D1	-0.0604	0.0580	-1.0406	0.3190
INPT	7.0484	1.5128	4.6591	0.0010
LKCAPITA	0.2704	0.1784	1.5159	0.1550

Source: Author's Computations.

Table 9: Diagnostic Test Statistic

Diagnostic Checks	Test Statistic	P-Value
χ^2_{SC}	0.9499	0.3300
χ^2_{FF}	0.6603	0.4160
χ^2_{NOR}	0.8283	0.6610
χ^2_{HET}	1.6615	0.1970

Source: Author's Computations.

The short-run relationship between financial development and economic growth is further investigated using error correction model. The results presented in Table 10 points that the past error is negative and statistically significant at 5 percent level which is consistent with the model. This coefficient indicates the speed of adjustment in the short-run equilibrium with the long-run disequilibrium in past period. It implies that nearly 51 percent of the disequilibria in real GDP per-capita growth of the previous year's shock adjust back to the long-run equilibrium in the current year. The present model also holds conditions of the other diagnostic tests (Table 11).

Table 10: Error Correction Representation for the Selected ARDL Model
ARDL(1,1,1,0,1) selected based on Akaike Information Criterion

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
? TR	0.1175	0.0315	3.7263	0.0030
? FDI	0.0003	0.0003	0.8603	0.4060
? LKCAPITA	0.1367	0.1180	1.1577	0.2700
? D1	-0.0305	0.0310	-0.9840	0.3450
? INPT	3.5615	1.0605	3.3581	0.0060
ecm(-1)	-0.5053	0.1664	-3.0364	0.0100

Source: Author's Computations.

Table 11: Diagnostic Test Statistic of ARDL Estimates

Test Statistic	Value
R-Squared	0.9800
F(5,12)	117.63
DW Statistic	2.3247

Source: Author's Computations.

The above estimated results indicate the presence of long-run as well as short-run relationships between financial deepening and economic growth for Hong Kong. It is found that Hong Kong has enjoyed the developed financial system both in institutions and markets as discussed earlier. Also, the country has secured 2nd position in the financial stability index computed by World Economic Forum for 52 countries. It is inferenced that developed financial system might have facilitated in advancement of economic growth of the country.

Conclusion

The composition of financial deepening index for Hong Kong suggests that the credit delivered to private sector has highest weight and improvement in this direction may further strengthen the financial deepening of Hong Kong. Also, the balanced approach for financial markets and financial institutions seems a major policy lesson for Hong Kong to make the financial system stronger. The estimated results of specified model indicate the presence of long-run relationship between financial deepening and economic growth. However, the long run coefficient of deepening does not appear significant in the long-run growth regression. The error correction representation shows that the coefficient of the past error term is consistent with economic theory as it should be negatively significant. Based on the

presence of relationship between financial deepening and economic growth, it can be pronounced that financial system is elevating all the functions smoothly in the economy. The significant partial coefficient of trade openness suggests that competitive external environment is inducing the economic growth of Hong Kong which is consistent to the earlier statement of the export driven economy. It can be concluded that in addition to the other primitive inputs, financial system plays an important role in the economic growth of Hong Kong. In this process, enhancing the performance of financial system may be a best avenue for the policymakers in strengthening the economy.

References

Beck, T., Levine, R. & Kunt, D. A., (1999). A new database on financial development and structure. (Policy Research Working Paper 2146). World Bank.

Cheng Te-Liang, (1984). Hsiang-kang Ching-chih Wen-ti Chu-t'an (A preliminary investigation of the Economic Problem of Hong Kong). Canton: Chungshan Univ. Press.

Chung, S. Y. (1983). Hong Kong: a springboard into Asia. Hong Kong Manager 19: 17-21.

Demirguc-Kunt, A. & Levine, R. (1996a). Stock market development and financial intermediaries: stylized facts. World Bank Economic Review, 1(2), 291-322.

Demirguc-Kunt, A. & Levine, R. (1996b). Stock markets, corporate finance and economic growth: An overview. World Bank Economic Review, 19(2), 223-40.

Diamond, Douglas W. & Dybvig, Philip H. (1983). Bank runs, deposit insurance, and liquidity. Journal of Political Economy, 21(3), 401-419.

Engle, R. F. & Granger, C. W. J. (1987). Cointegration and error-correction: representation, estimation and testing. Econometrica, 55(2), 251-276.

Fritz, R.G. (1984). Time series evidence on the causal relationship between financial deepening and economic development. Journal of Economic Development, 9, 91-111.

Fuller, W.A. (1976). Introduction to statistical time series. New Work, Wiley.

Goldsmith, Raymond W. (1969). Financial structure and development. New Haven, CT: Yale University Press.

Greenwood, J. & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. Journal of Political Economy, 98(5), 1076-1107.

Gregorio Jose De & Guidotti Pablo E. (1995). Financial development and economic growth. World Development, 23(3), 433-448.

Gurley, John & Shaw, E.S. (1955). Financial aspects of economic development. American Economic Review, 45(4), 515-538.

International Monetary Fund, International Financial Statistics Yearbook (Various issues), World Economic Outlook October 2009. Washington, DC.

International Monetary Fund, International Financial Statistics, (2009). CD ROM.

Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on co-integration with application to demand for money. Oxford Bulletin of Economics and Statistics, 52(2), 169-210.

King, R. G. & Levine, R. (1993a). Finance and growth: Schumpeter might be right. Quarterly Journal of Economics, 108(3), 717-737.

King, R. G. & Levine, R. (1993b). Finance, entrepreneurship and growth. Journal of Monetary Economics, 32(3), 513-542.

Kunt, A.D. & Levine, R. (1999). Bank-based and market-based financial systems: cross country comparison. (Policy Research Working Paper 2143). World Bank.

Laurenceson, J. & Chai, C. H. J. (2003). Financial reform and economic development in China. Cheltenham, UK: Edward Elgar.

Levine, R. & Zervos, S. (1996). Stock market development and long-run growth. The World Bank Economic Review, 10(2), 323-339.

Levine, R. & Zervos, S. (1998). Stock markets, banks and economic growth. American Economic Review, 88(3), 537-558.

Levine, R. (1991). Stock markets, growth, and tax policy. Journal of Finance, 46(4), 1445-1465.

Levine, R. (1997). Financial development and economic growth: views and agenda. Journal of Economic Literature, 35(2), 688-726.

McKinnon, R. (1973) Money and capital in economic development. Washington, DC, Brookings Institution.

Pesaran, M. H. & Pesaran, B. (1997). Working with Microfit 4.0: interactive econometric analysis. Oxford: Oxford University Press.

Pesaran, M. H. & Shin, Y. (1999). An autoregressive distributed lag modelling approach to co-integration analysis. In S. Strom (Ed.), Econometrics and economic theory in 20th Century: The Ragnar Frisch centennial symposium (Chapter 11). New York: Cambridge University Press.

Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Phillips, C.P.B. & Perron, P. (1988). Testing for unit-root time series regression. Biometrica, 75, 335-346.

Schumpeter, J. (1912). The theory of economic development. Cambridge: Harvard University Press.

Shaw, E. S. (1973). Financial deepening in economic development. New York: Oxford University Press.

So, Y. Alvin (1986). The Economic success of Hong Kong: Insights from a World-System perspective. Sociological Perspectives, 29(2), 241-258

World Bank, World Development Indicators (Various issues).

World Economic Forum. Financial Development Report (2008, 2009 & 2010). World Economic Forum, USA Incorporation, New York: USA.

Endnotes:

1 It is grounded on seven pillars of financial development viz. institutional environment, business environment, financial stability, banks, non-banks, financial markets and size, depth & access of financial system.

2 Financial Development Report 2010. World Economic Forum, USA Incorporation, New York, USA.

3 Katsiaryna Svirydzenka (January 2016). Introducing a New Broad-based Index of Financial Development, IMF Working Paper, WP/16/5.

4 To make the results comparable and easy to understand, financial deepening index and economic growth are transformed into scale of 100. The transformation is carried out by following method.

$YI = (Yt - Ymin)/(Ymax - Ymin)*100$

Where YI is real per-capita GDP in scale of 100, Yt is the real per-capita GDP in period t, Ymin and Ymax represents the minimum and maximum value of GDP for the sample period.

Similarly the financial development index which is computed from Principal Component Analysis is presented in the scale of 100. The formal estimation of the relationship between financial development and economic growth is followed by its descriptive analysis.

5 YI and FDI* are real per-capita GDP and Financial Deepening Index in scale of 100.

6 F(LY/FDI, LKCAPITA, TR, D1) denotes that LY is explained by FDI, LKCAPITA, TR and Dummy of Asian financial crisis period and so on.

7 The critical values are I(0) = 4.385 and I(1) = 5.615 at the 1 % level of significance (see Pesaran et al.; 2001).