



## Co-Integration Analysis of Relationship between Institutional Finance and Entrepreneurial Development in Karnataka

### KEYWORDS

Institutional Finance, Capital formation, Co-integration, causation, Consumer Goods, Entrepreneurial Development

**Premakumara GS**

Faculty of Economics, UGC Research Awardee,  
University of Mysore

**Mahadevappa M.M.**

Faculty of Economics and Management, Shree  
Venkateshwara First Grade Collage, Bangalore

**ABSTRACT** *There have been wide opportunities in Karnataka for business and entrepreneurial activities. The government of Karnataka has set-up an exclusive institution namely, Karnataka State Finance Corporation to promote entrepreneurial and developmental activities by providing necessary finance. The present paper exhibit the relationship between institutional finance and industrial development in Karnataka. With the help of co-integration analysis we have attempted to find the long-run stable relationship between institutional finance and industrial development. It has been found from the co-integration analysis that the institutional finance has long-run stable relationship with gross capital formation, employment, index of consumer goods, index of consumer durables and index of capital goods. Hence, there has been strong relationship between institutional finance and entrepreneurship development, but, insufficient to promote entrepreneurial development. Therefore, there is dire need to strengthen KSFC and institutional finance for effective entrepreneurial development.*

### Introduction

Karnataka is one of the major industrial states of India. Bangalore, the capital city of Karnataka has been called as Silicon Valley and known for IT and BT business. There have been wide opportunities in Karnataka for business and entrepreneurial activities. Institutional Finance is being considered as one of the major determinant of entrepreneurial development. Granting institutional finance to new industries and existing enterprises, could lead to overall development of the country (Muhammadsuhaimee, Roslan, & Nor Azam, 2013). The government of Karnataka has set-up an exclusive institution namely, Karnataka State Finance Corporation to promote entrepreneurial and developmental activities by providing necessary finance. Given the back-ground, in this paper an attempt has been made to exhibit the relationship between institutional finance and industrial development in Karnataka. With the help of co-integration analysis we have attempted to find the long-run stable relationship between institutional finance and industrial development.

### Review of Literature:

There has been a positive relationship between entrepreneurial development and economic development (Peter & Peter, 2009). Institutions play predominant role in entrepreneurial development (Georgios, Chortareas D; Claudia, Girardone; Alexia, Ventouri, 2013), (Siong, Azman-Saini, & Mansor, 2013), (Emanuele, Massimiliano, Marco, & David, 2013), (Dara, Szyliowicz; Tiffany, Galvin, 2010). Government and public policies significantly intervene in promotion of entrepreneurship and entrepreneurial development (Douglas & Dan, 2013), (Michael, 2011). Returns to entrepreneurial activities depend on the ability of entrepreneurs (Banjo & Doren, 2013). Equally, availability of financial support is important for sustainable entrepreneurial and entrepreneurship development and also for economic development and poverty eradication (Georgios, E. Chortareas; Claudia, Girardone; Alexia, Ventouri, 2013), (Muhammadsuhaimee, Roslan, & Nor Azam, 2013). Multiple factors contributes for entrepreneurship development and institutional finance is most important one among them (Gamal & Galt, 2011),

(Alex, 2010), (Carmen, 2013), (Mark, Mark, & Jane, 2013), (Ping & E. Burton, 2007). Therefore, institutional finance play immense role in entrepreneurship development.

### Methodology:

In this paper an attempt has been made to exhibit the relationship between institutional finance and entrepreneurship development in Karnataka. Karnataka State Finance Corporation (KSFC) loan has been treated as proxy for institutional finance. Since the comparable data not available for micro, small, medium and large scale industries for all the years, credit of KSFC treated as proxy for Institutional Finance. Industrial Production related variables have been treated as proxy for entrepreneurs development. The major variables considered for Karnataka level are Karnataka state finance corporation loan (KSFC), Gross capital formation (GCF), Employment (EMP), Consumer goods (CG) Consumer durable (CD) Capital goods (CPG) data were collected for the period form 2000-01 to 2011-2012.

The period has been fixed based on the availability of comparable data. Since the time series has been used in the analysis the necessary checks were taken to the test the stationarity of data. The Augmented Dickey-Fuller (ADF) tests were conducted to find the stationarity of data. The Johansen co-integrated models were use to find the long-run stable relationship between institutional finance and industrial development.

### ADF test for Stationarity:

For Karnataka level data, the ADF tests were conducted to find the stationarity of data. The tests were conducted for level and difference data with the difference models; without drift and trend, with drift and without trend, and with drift and trend. The test results for level data are presented below.

**Table 1: ADF Test for Stationarity at Level Data**

Descriptions		Level					
Sl. No.	Variables	None		Intercept		Intercept with Trend	
		test-statistic	Prob	test-statistic	Prob	test-statistic	Prob
1	KSFCL	1.526	0.958	-0.839	0.766	-2.132	0.475
2	GCF	0.116	0.694	-0.187	0.908	-3.292	0.124
3	EMP	3.715	0.999	3.203	0.999	1.762	0.999
4	CG	9.481	1.000	3.010	0.999	0.233	0.993
5	CD	4.410	0.999	1.096	0.993	-1.950	0.562
6	CPG	3.412	0.998	0.392	0.970	-2.908	0.210

Source: Economic Survey of Karnataka 2011-12.

The ADF (Augmented Dickey-Fuller) test was conducted to find the stationarity of data for the level data. The test was conducted with three types of models;

1. without intercept and trend ( $y_t = \delta y_{t-1} + e_t$ )
2. with intercept ( $y_t = \alpha + \delta y_{t-1} + e_t$ )
3. with intercept and trend ( $y_t = \alpha + \delta y_{t-1} + T + e_t$ )

It has been found from the ADF test with level data that none of the variables found stationary. Hence, in the following section ADF tests were conducted for first and second difference data.

**Table 2: ADF Test for Stationarity at Difference Data**

Descriptions		First Difference					
Sl. No.	Variables	None		Intercept		Intercept with Trend	
		test-statistic	Prob	test-statistic	Prob	test-statistic	Prob
1	KSFCL	-3.463	0.002	-	-	-	-
2	GCF	0.531	0.809	-4.389	0.012	-	-
3	EMP	1.758	0.967	0.978	0.989	-3.898	0.057
4	CG	2.206	0.984	0.602	0.977	-3.484	0.097
5	CD	-0.370	0.521	-3.117	0.057	-8.042	0.001
6	CPG	-0.717	0.377	-4.689	0.005	-	-

Source: Economic Survey of Karnataka 2011-12.

KSFCL: Karnataka State Finance Corporation Loan Rs in Lakhs

GCF: Gross Capital Formation in Crores.

EMP: Employment in Thousands.

CG: Industrial Index for Consumer Goods.

CD: Industrial Index for Consumer Durables.

CPG: Industrial Index for Capital Goods.

It has been found from the ADF test that the following variables were found stationary at their first difference;

Data for KSFCL is  $I \sim (1)$ , Integrated of the order one.

Data for GCF is  $I \sim (1)$ , Integrated of the order one.

Data for Employment is  $I \sim (1)$ , Integrated of the order one.

Data for CG is  $I \sim (1)$ , Integrated of the order one.

Data for CD is  $I \sim (1)$ , Integrated of the order one.

Data for CPG is  $I \sim (1)$ , Integrated of the order one

**Analysis of Long-run Relationship:**

In this part of analysis an attempt has been made to identify the long-run relationship of institutional finance with selected variables related to industries. In the previous analysis it has been found that, the time series data for the variables KSFC Loan, Gross capital formation, employment, Consumer goods, and Capital goods, were found stationary at their first difference. The Johansen co-integration test has been used for the same order of integration to find the long run relationship of non-stationary variables. Therefore, an attempt has been made to identify the long-run relationship of KSFC Loan with Gross capital formation, employment, Consumer goods, and Capital goods.

**Relationship of KSFC Loan and Gross Capital Formation:**

The time series non stationary data integrated of order one for both KSFC loan and Gross capital formation has been used for the analysis. The Johansen co-integration test was used to find the long-run relationship.

**Table 3: Co-integration between KSFC Loan and Gross Capital Formation**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.
None	0.956560	47.05085	18.39771	0.0000***
At most 1	0.791687	15.68715	3.841466	0.0001***
1 Co-integrating Equation(s):		Log likelihood	-159.4578	
Normalized co-integrating coefficients (standard error in parentheses)				
KSFCL	GCF			
1.000000	0.967565	(1.02005)		

Source: Economic Survey of Karnataka 2011-12.

Note: \*\*\* Significant at one percent level.

It has been found from the co-integration test that finance and employment have long-run relationship at one percent level. Therefore, there has been significant long-run stable relationship between KSFC loan and gross capital formation in Karnataka.

**Relationship of KSFC Loan and Employment:**

The time series non stationary data integrated of order one for both KSFC loan and employment has been used for the analysis. The Johansen co-integration test was used to find long-run relationship.

**Table 4: Co-integration between KSFC Loan and Employment**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.
None	0.823009	19.92837	18.39771	0.0304
At most 1	0.229859	2.811816	3.841466	0.0961*
1 Co-integrating Equation(s):		Log likelihood	-210.2097	
Normalized co-integrating coefficients (standard error in parentheses)				
KSFC	EMP			
1.000000	0.040160	(0.03417)		

Source: Economic Survey of Karnataka 2011-12.  
 Note: \* Significant at ten percent level.

It has been found from the co-integration test that finance and employment have long-run relationship at ten percent level. Therefore, there has been significant long-run stable relationship between KSFC loan and employment in Karnataka.

**Relationship of KSFC Loan and Index of Consumer Goods:**

The time series non stationary data integrated of order one for both KSFC loan and index of consumer goods has been used for the analysis. The Johansen co-integration test was used to find the long-run relationship.

**Table 5: Co-integration between KSFC Loan and Index of Consumer Goods:**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.
None	0.654726	17.15472	15.49471	0.0279**
At most 1	0.479026	6.520559	3.841466	0.0107**
1 Co-integrating Equation(s):		Log likelihood	-125.5402	
Normalized co-integrating coefficients (standard error in parentheses)				
KSFC	CG			
1.000000	774.4999	(144.209)		

Source: Economic Survey of Karnataka 2011-12.  
 Note: \*\* Significant at five percent level.

It has been found from the co-integration test that KSFC loan and index of consumer goods have long-run relationship at five percent level. Therefore, there has been significant long-run stable relationship between KSFC loan and index of consumer goods in Karnataka.

**Relationship of KSFC Loan and Index of Consumer Durables:**

The time series non stationary data integrated of order one for both KSFC loan and index of consumer durables has been used for the analysis. The Johansen co-integration test was used to find the long-run relationship.

**Table 6: Co-integration between KSFC Loan and Index of Consumer Durables:**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.
None	0.750245	22.32654	20.26184	0.0256**
At most 1	0.570605	8.453790	9.164546	0.0681*
1 Co-integrating Equation(s):		Log likelihood	-131.7149	
Normalized co-integrating coefficients (standard error in parentheses)				
KSFC	CD	C		
1.000000	669.8687	39674.60		
	(61.1361)	(7751.75)		

Source: Economic Survey of Karnataka 2011-12.  
 Note: \*\* Significant at five percent level. \* Significant at ten percent level.

It has been found from the co-integration test that KSFC loan and index of consumer durables have long-run relationship at ten percent level. Therefore, there has been significant long-run stable relationship between KSFC loan and index of consumer durables in Karnataka.

**Relationship of KSFC Loan and Index of Capital Goods:**

The time series non stationary data integrated of order one for both KSFC loan and index of capital goods has been used for the analysis. The Johansen co-integration test was used to find the long-run relationship.

**Table 7: Co-integration between KSFC Loan and Index of Capital Goods:**

Hypothesized		Trace	0.05	
No. of CE(s)	Eigen-value	Statistic	Critical Value	Prob.
None	0.491586	9.673131	15.49471	0.3067
At most 1	0.252375	2.908532	3.841466	0.0881*
1 Co-integrating Equation(s):		Log likelihood	-132.7833	
Normalized co-integrating coefficients (standard error in parentheses)				
KSFC	CPG			
1.000000	1323.830	(333.089)		

Source: Economic Survey of Karnataka 2011-12.  
 Note: \* Significant at ten percent level.

It has been found from the co-integration test that KSFC loan and index of capital goods have long-run relationship at ten percent level. Therefore, there has been significant long-run stable relationship between KSFC loan and index of capital goods in Karnataka.

**Conclusion:**

In Karnataka, the major variable identified for the study was KSFC's credit and it was found stationary, integrated of the order one. Therefore, the other variables namely, gross capital formation, employment, index of consumer goods, index of consumer durables and index of capital goods, which were integrated of the order one, have been considered for co-integration analysis. It has been

found from the co-integration analysis that the institutional finance has long-run stable relationship with gross capital formation, employment, index of consumer goods, index of consumer durables and index of capital goods. Even-though, they have long-run relationship, the causality test identified that KSFC credit was insufficient to influence gross capital formation, employment, index of consumer goods, index of consumer durables, index of capital goods. Therefore, there has been strong relationship between institutional finance and entrepreneurship development, but, insufficient to promote entrepreneurial development. Therefore, there is dire need to strengthen KSFC and institutional finance for effective entrepreneurial development.

## REFERENCE

- Alex, N. (2010). Institutionalizing Social Entrepreneurship in Regulatory Space: Reporting and Disclosure by Community Interest Companies. *Accounting, Organizations and Society* 35 , 394-415. | Carmen, S. (2013). Extending Dunning's Investment Development Path: The role of home Country Institutional determinants in explaining outwards Foreign Direct Investment. *International Business Review* 22 , 615-637. | Dara, Szylowicz; Tiffany, Galvin. (2010). Applying Broader Stroker: Extending Institutional Perspectives and Agendas for International Entrepreneurship Research. *International Business Review*, 19 , 317-332. | Douglas, C., & Dan, L. (2013). Public Policy, Entrepreneurship, and Venture Capital in the United States. *Journal of Corporate Finance* 23 , 345-367. | Emanuele, B., Massimiliano, B., Marco, B., & David, H. (2013). The Role of Institutional Investors in Public-to-Private Transactions. *Journal of Banking & Finance* 37 , 4327-4336. | Gamal, I., & Galt, V. (2011). Explaining Ethnic Entrepreneurship: An Evolutionary Economics Approach. *International Business Review* 20 , 607-613. | Georgios, Chortareas D; Claudia, Girardone; Alexia, Ventouri. (2013). Financial Freedom and Bank Efficiency: Evidence from the European Union. *Journal of Banking & Finance* 37 , 1223-1231. | Georgios, E. Chortareas; Claudia, Girardone; Alexia, Ventouri. (2013). Financial Freedom and Bank Efficiency: Evidence from the European Union. *Journal of Banking & Finance* 37 , 1223-1231. | Mark, A. C., Mark, W. D., & Jane, M. w. (2013). The Social Construction, Challenge and Transformation of a Budgetary Regime: The Endogenization of Welfare Regulation by Institutional Entrepreneurs. *Accounting, Organizations and Society*, 38 , 333-364. | Michael, T. (2011). Legal Institutions and High-growth Aspiration Entrepreneurship. *Economic Systems* 35 , 158-175. | Muhammadsuhaimee, Y., Roslan, A.-H., & Nor Azam, A.-R. (2013). Does Entrepreneurship Bring An Equal Society and Alleviate Poverty? Evidence from Thailand. *Procedia Social and Behavioral Sciences*, 91 , 331-340. | Peter, T. L., & Peter, J. B. (2009). Two-tiered Entrepreneurship and Economic Development. *International Review of Law and Economics*, 29 , 252-259. | Ping, W., & E. Burton, S. (2007). Launching Professional service Automation: Institutional Entrepreneurship for Information Technology Innovations. *Information and organization* 17 , 59-88. | Siong, H. L., Azman-Saini, W., & Mansor, H. I. (2013). Institutional Quality Thresholds and the Finance-Growth nexus. *Journal of Banking & Finance* 37 , 5373-5381. |