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Direction of the Causal Relationship between Construction and the National Economy of Sri Lanka

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Abstract: Causal relationships between construction and national economies have received considerable attention in the past. However, the results of research on this topic provide contrasting views about the nature of the relationship. This paper investigates the direction of the causal relationship between construction and the economy of a developing country, Sri Lanka, using empirical data for selected economic and construction indicators for the period 1990 to 2009. The pattern of the causal relationship was determined using the Granger causality test. The findings reveal that national economic activities precede construction activities for all indicators except construction investment. The study therefore concludes and strengthens the body of knowledge concerning the causal relationship between the construction sector in Sri Lanka and the national economy tending towards a uni-directional relationship, with the national economy inducing growth in the construction sector and not vice versa.

Keywords: Economy, Construction, Granger Causality, Sri Lanka

INTRODUCTION

The construction industry encompasses a variety of activities and is a vital sector in any economy (Bielsa and Duarte, 2011; Anaman and Osei-Amponsah, 2007). Construction is strongly linked to most of the other economic activities of a country (Ozkan, Ozkan and Gunduz, 2012; Rameezdeen and Ramachandra, 2008; Lewis, 2004; Bon, 2000; Pietroforte, Bon and Gregori, 2000). It is considered to be an important partner in economic growth and to mirror the stage of economic development (Ozkan, Ozkan and Gunduz, 2012; Wilhelmsson and Wigren, 2011; Ruddock and Lopes, 2006). There is, however, high variability in the relationships between construction and national economies. Hans and Ofori (2001) suggest that mature economies have larger construction industries that contribute 5%–8% to the gross domestic product (GDP), whereas the construction industries in developing countries contribute only 3%–5%. Lopes (1998) have found that less developed countries require only minimum levels of construction output for long-term and sustainable growth. In contrast, Low (1994) suggests that in most developing countries, the capital formation in construction accounts for 7%–13% of the GDP, whereas that in most industrialised countries accounts for 10%–16% of the GDP. Statistics from the Central Bank of Sri Lanka indicate that the Sri Lankan construction industry has contributed 6%–8% of the GDP on average during the last decade (Central Bank of Sri Lanka, 2008; 2012). A similar situation is observed for construction investment. On average, construction investment in Sri Lanka during the last decade accounted for 16% of the GDP.

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THE CAUSAL RELATIONSHIP BETWEEN CONSTRUCTION AND THE NATIONAL ECONOMY

There are opposing views with regard to the relationship between construction and the economy of a country. Some studies have suggested that construction influences the economy, whereas others have suggested that the economy influences construction. We believe that gaining a better understanding of this lead/lag relationship requires more evidence from other countries. This is particularly necessary for developing countries because most of the previous studies on this subject used data from developed countries.

One view is that construction causes the economy to grow because it creates physical facilities that are needed for the development of other productive activities (Hosein and Lewis, 2005). According to this view, construction activities cause GDP to grow as the construction sector buys other sectors' output (Ofori, 1990; Lean, 2001). In a follow-up study, Lean has concluded that construction influences/leads other sectors' output as well as GDP (Lean, 2002). This phenomenon was observed in Ghana, where growth in construction caused a growth in GDP (Anaman and Osei-Amponsah, 2007). Anaman and Osei-Amponsah used the Granger causality test for their analysis and show that economic growth lags three years behind construction growth in Ghana.

The opposing view holds that GDP causes growth in construction output (Tse and Ganesan, 1997; Yiu et al., 2004; Lopes, Nunes and Balsa, 2011). Lopes's results suggest a uni-directional but weak relationship. Rapid economic expansion in China resulted in a boost in construction activities in that country (Sjoholt, 1997). Not only the construction market but also the construction maintenance market was shown to depend on the country's economic performance (Tan, Shen and Langston, 2012).

Interestingly, some other studies suggest a bi-directional relationship between various sub-sectors of the construction industry and the national economy (Ozkan, Ozkan and Gunduz, 2012; Jackman, 2010; Hongyu, Park and Siqi, 2002). These studies characterise the sensitivity of the construction industry to the national economy and vice versa. An interesting study by Green (1997) showed the difference in causality between a national economy and construction sub-sectors. Green divided construction investment into two; residential and non-residential and showed that former caused GDP to grow while the GDP growth induced letter in the United States.

Based on the foregoing discussion, a test of the link between construction and the economy, using empirical data from Sri Lanka, is presented in this paper. This analysis is intended to extend knowledge on causal relationships and other general construction issues related to the case study country, Sri Lanka. Sri Lanka is a developing country with a per capita income of US dollar 2,041 (International Monetary Fund, 2010). Sri Lanka has a strong construction sector that contributes significantly to its GDP. The total value of new construction accounts for more than 60% of the total gross domestic fixed capital formation and the industry provides employment to approximately 7% of the total labour force (Central Bank of Sri Lanka, 2010). The construction industry in Sri Lanka is expected to grow steadily and systematically in the long term and to be a significant and integral part of the economy (Rameezdeen and Ramachandra, 2008). This study was conducted to determine whether the growth in the Sri Lankan construction industry can lead the country on path of economic growth or whether growth in the economy leads to growth in the construction industry. The findings of this study are expected to enhance the knowledge of policy makers and other industry members in regulating their investment opportunities, recognising that the construction sector plays a vital role in an economy.

DESCRIPTION OF METHODS

The study on which this paper is based involved use of the Granger causality test to determine the causal direction of the relationship between the construction industry and the economy in Sri Lanka. The Granger causality test is an econometric technique pioneered by Granger and Newbold (1986) that is used to detect relationships between economic variables. For example, Demirbas (1999) applied the Granger causality test to identify the relationship between public expenditure and gross national product (GNP). Other relationships that have been studied using the Granger causality test include those between construction activity and the aggregate economy (using construction flow and GDP) (Tse and Ganesan, 1997; Anaman and Osei-Amponsah, 2007), between GDP and residential and non-residential investment (Green, 1997) and between fluctuations in construction output and the economy (Lean, 2002).

The Granger causality test is used here to examine the relationship between the construction sector and the Sri Lankan macro economy. The Granger causality test uses regression to find the causal relationships between two variables, X_t and Y_t (Ozkan, Ozkan and Gunduz, 2012; Seth, 2007; Dakurah, Davies and Sampath, 2001). The regression provides statistical evidence of whether the current *Y* value can be explained by the past values of *Y* and *X*. The Granger causality test considers two autoregressive (AR) models, illustrated below:

$$X_t = \sum_{i=1}^{n} \alpha_{0i} Y_{t-i} + \sum_{i=1}^{n} \beta_{0i} X_{t-1} + u_t \qquad \text{Eq. 1}$$

$$Y_t = \sum_{i=1}^{n} \alpha_{1i} X_{t-i} + \sum_{i=1}^{n} \beta_{1i} Y_{t-1} + v_t \qquad \text{Eq. 2}$$

where n is the maximum number of lagged observations included in the model and U_t and V_t are the random error terms for each time series. Where causality exists, we say "*X* is Granger-causing *Y*" when a_{0i} is not zero in Equation 1. Similarly, we say "*Y* is Granger-causing *X*" if a_{1i} is not zero in Equation 2. If both of these events occur, then feedback effects exist.

Testing causality involves using *F*-tests to ascertain whether lagged information on a variable *Y* provides any statistically significant information about a variable *X* in the presence of lagged *X*. If not, then we say that "*Y* does not Granger-cause *X*". There are four possible outcomes of a Granger causality test (Mukherjee, White and Wuyts, 1998):

1. no causal relationship between two variables,
2. unidirectional causality from *X* to *Y*,
3. unidirectional causality from *Y* to *X* and
4. bi-directional causality (*X* causes *Y* and *Y* causes *X*).

Two sets of indicators are used in the current study. One set represents construction, while the second represents the national economy. Construction performance is measured using construction value added (CVA), the value of construction in the total gross domestic fixed capital formation (CGDFCF) and construction cost indices (CCI). These are the predominant indicators for which published time series data are available for the Sri Lankan construction industry. The CVA is defined as the gross construction output minus non-factor input. The CGDFCF is defined as the aggregate value of capital expenditure incurred for building and other construction by household firms and the government, together with the capital expenditure incurred by foreign household firms or governments, within the country over a given period of time (Fernando, 2002). The CCI is an indicator of the evolution of costs incurred by contractors on construction projects. The CCI is determined from the accumulation of actual wages, material costs and plant and other overhead charges.

For the national economy, the gross domestic product (GDP), gross domestic product deflator (GDPD), unemployment rate (UE) and balance of trade (BT) were considered. These indicators were selected based on macroeconomic objectives and cover the following aspects of the economy: GDP, the national product; GDPD, the price changes of goods; UE: the labour force and BT: the external sector. Previous studies commonly used GDP as an indicator of economic growth, except Lean (2002), who used the balance of payments and domestic prices. The indicators used for this study were based on constant prices for the period 1990–2009 and were obtained from data published by the Central Bank of Sri Lanka (Central Bank of Sri Lanka, 2002; 2007; 2010).

RESULTS

A preliminary examination of the data involved preparing graphical representations of the selected indicators. This examination yielded interesting results, shown in Figures 1–4. Figure 1 shows that the changes in GDP, CVA, CGDFCF and CCI follow cyclical patterns with equal numbers of upturns and downturns, although the upturns and downturns of the series do not occur at the same times. This figure suggests that there is a lead/lag relationship between GDP and CVA and another between CGDFCF and CCI.

Identical patterns can be observed over the study period between GDPD, CVA, CGDFCF and CCI, and between BT, CVA, CGDFCF and CCI, as shown in Figures 2 and 3, respectively. An indistinguishable pattern is noticeable in Figure 4. Compared to the other indicators, Figure 4 shows that changes in the unemployment rate reached a peak only once and had no significant troughs during the period considered. Moreover, changes in the unemployment rate did not exhibit a complete cycle, while the other indicators exhibited more than one cycle during the 1990–2009 periods. The unemployment rate was therefore excluded from the detailed statistical analysis because its pattern was different from those of the other indicators.

Time series, especially economic data in level form, is non-stationary and most statistical methods, including the Granger causality test, require that time series be transformed into stationary form (Huang, 1995; Feige and Pearce, 1979; Granger and Newbold, 1974). Stationarity can be detected using any of three tools: the autocorrelation function (ACF), the correlogram (Q-statistic) and unit root tests. Unit root tests are widely used to detect and transform time series into stationary forms (Lean, 2001). Among the commonly used unit root tests for the order of integration are the Dickey–Fuller (DF) test, the augmented Dickey–Fuller (ADF) test and the Phillips–Perron (PP) test (Dickey and Fuller, 1979; Perron, 1988). For the purposes of this study, the augmented Dickey–Fuller (ADF) test was used, based on the recommendations of past studies, because the test considers situations in which the white noise error terms are correlated, which is an improvement over the Dickey–Fuller (DF) test.

Table 1 presents the critical and calculated values for the selected indicators at the 5% significance level. Comparison of the critical values with the calculated values reveals that BT and CGDFCF are stationary at the first level of difference. The calculated values fall within the rejection region, implying that the null hypothesis can be rejected and that the time series has no unit root. Similarly, the values for GDP, GDPD and CVA indicate that they are stationary at the second level of difference. CCI, however, was found to be non-stationary at the second level of difference.

The regressions (1) and (2) described previously were conducted to determine the possible lag values of each variable. The number of lags in a causality test is arbitrary and depends on the relationship between the variables. The causality between variables is described in the following three sections. Each section describes the results of pairwise regressions of a single economic indicator with each of three indicators for construction.

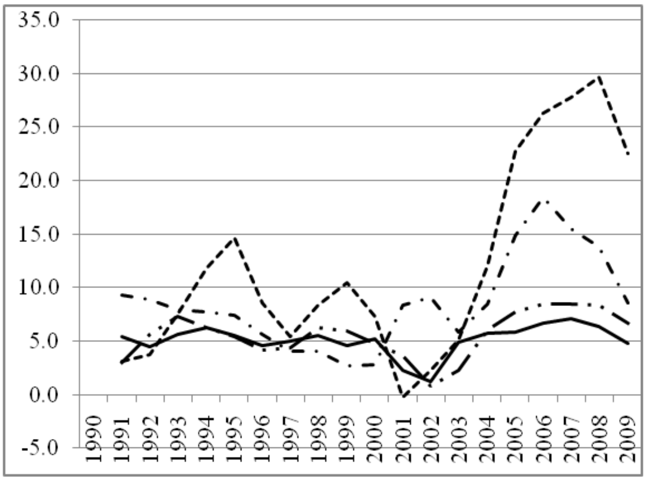

Figure 1. Changes in GDP, CVA, CGDFCF and CCI

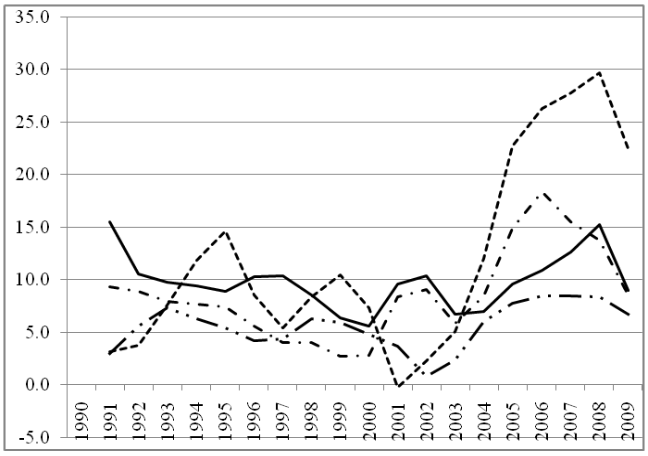

Figure 2. Changes in GDPD, CVA, CGDFCF and CCI

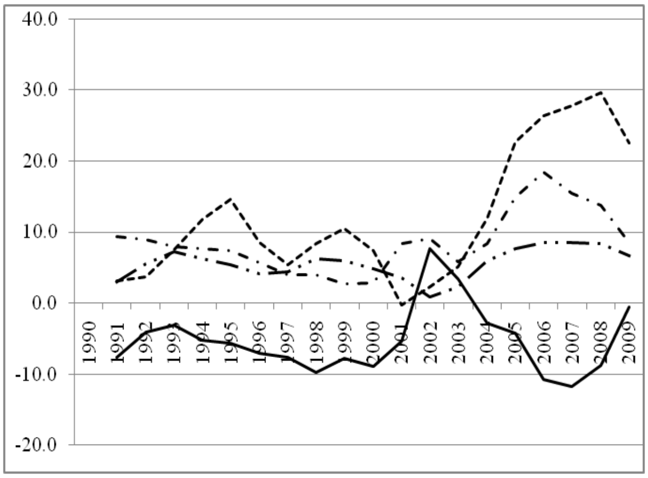

Figure 3. Changes in BT, CVA, CGDFCF and CCI

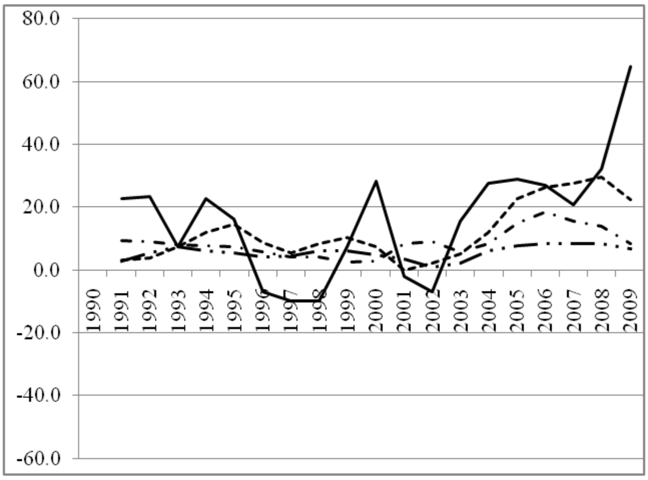

Figure 4. Changes in UE, CVA, CGDFCF and CCI

Notes:

———	Change in GDP, GDPD, BT and UE (two year moving average)
— · · ·	Change in CVA (two year moving average)
....	Change in CGDFCF (two year moving average)
— · —	Change in CCI (two year moving average)

Table 1. Unit Root Test Results for Variables

Variable	At Level		At First Difference		At Second Difference	
	No Trend and Intercept	With Trend and Intercept	No Trend and Intercept	With Trend and Intercept	No Trend and Intercept	With Trend and Intercept
Critical value at 5%	–1.9504	–3.5386	–1.9504	–3.5386	–1.9504	–3.5386
GDP	4.4199	1.6445	–0.4968	–3.9661	–9.0553	–9.1952
GDPD	3.2519	3.0933	2.0211	–0.6578	–5.2603	–6.0771
BT	6.0741	4.1637	–4.2139	–6.2124	–	–
CVA	2.9577	0.2734	–0.8241	–2.8046	–7.8325	–7.7790
CGDFCF	4.4524	0.1212	–3.1690	–6.1378	–	–
CCI	1.4116	–0.5006	0.5475	–1.5328	–2.7339	–2.7542

To test causality, the results were validated using the residual plots, the autocorrelation function (ACF) and the Durbin–Watson (DW) statistic. This paper describes the results for the DW statistic only.

Causality between CGFCF[1], CVA[2], CCI[3] and GDP[2]

The direction of the causality between GDP and CVA was investigated by testing the hypotheses that GDP does not cause CVA and that CVA does not cause GDP. Table 2 presents the results. The probability value (0.02702) for the null hypothesis that GDP does not cause CVA for lag 1 indicates that it can be rejected at the 5% significance level. Therefore, it is concluded that GDP causes CVA for lag 1. The value of the DW statistic is 1.94, which indicates that there is no serial correlation between the error terms. Alternatively, none of the probabilities for the null hypothesis "CVA does not cause GDP" indicate that the hypothesis can be rejected for any lag up to 6. Thus, it is concluded that CVA does not cause GDP.

Similarly, the causality between GDP and CGDFCF was tested and the results are presented in Table 3. The probabilities in the second column for lags 2 to 4 indicate that the null hypothesis can be rejected and that GDP can be concluded to cause CGDFCF for lags 2 to 4. However, on the other hand, the probability values for all possible lags indicate that it is not possible to reject the null hypothesis of "CGDFCF does not causes GDP" at the 5% significance level. In both cases, the model can be accepted, as the respective DW values of 1.85 and 1.64 provide evidence that the residuals are not auto-correlated.

Table 4 presents the results of the causality test for GDP and CCI. The significant probability value (0.00994) for lag 1 only provides strong support for rejection of the null hypothesis that "GDP does not cause CCI" at the 5% significance level. Furthermore, the DW value of 1.88 indicates that there is no autocorrelation between the residuals. Therefore, it can be concluded that GDP causes CCI for lag 1. In the case of the alternative null hypothesis that "CCI does not cause GDP", the insignificant probabilities for possible lags provide no support for rejecting the null hypothesis. This conclusion is supported by the DW value being close to 2.0. Thus, CCI is not concluded to cause GDP for any lag.

Table 2. Causality between GDP[2] and CVA[2]

Lag Length	**GDP[2] Does Not Cause CVA[2]**		**CVA[2] Does Not Cause GDP[2]**	
	***F* Statistics**	**Prob.**	***F* Statistics**	**Prob.**
1	5.37134	0.02702	0.22668	0.63723
2	2.76753	0.07943	0.16561	0.84817
3	2.38952	0.09171	0.11444	0.95086
4	2.08922	0.11510	0.20169	0.93485
5	1.67726	0.18608	0.14546	0.97913
6	1.52228	0.23021	0.27120	0.94287

Table 3. Causality between GDP[2] and CGDFCF[1]

Lag Length	GDP[2] Does Not Cause CGDFCF[1]		CGDFCF[1] Does Not Cause GDP[2]	
	F Statistics	Prob.	*F* Statistics	Prob.
1	0.00033	0.98567	0.46519	0.50011
2	4.50393	0.01980	0.82644	0.44765
3	4.86264	0.00814	0.71893	0.54970
4	3.80471	0.01623	0.50978	0.72908
5	2.15563	0.10033	1.09763	0.39241
6	1.52796	0.22847	1.59569	0.20871

Table 4. Causality between GDP[2] and CCI[3]

Lag Length	GDP[2] Does Not Cause CCI[3]		CCI[3] Does Not Cause GDP[2]	
	F Statistics	Prob.	*F* Statistics	Prob.
1	10.5863	0.00994	1.88745	0.20274
2	3.50508	0.09809	0.92860	0.44530
3	1.91193	0.30394	0.48098	0.71845
4	NA	NA	NA	NA

Causality between GDPD[2] and CVA[2], CGFCF[1] and CCI[3]

The results of the hypothesis test for causality between GDPD and CVA are given in Table 5. Table 5 shows that there is no support for rejection of the hypotheses that "GDPD does not cause CVA" or "CVA does not cause GDPD" at the 5% significance level. However, the significant probability (0.01951) for lag 7 shows that it is possible to reject the null hypothesis at the 5% significance level. Therefore, it is concluded that GDPD does cause CVA for lag 7 but not vice versa. This conclusion is supported by the DW statistic value for the error terms being equal to 1.92.

The values in column 3 in Table 6 indicates that the null hypothesis that GDPD does not cause CGDFCF cannot be rejected at the 5% level for lags up to 6. However, the values in column 4 indicate that the null hypothesis that "CGDFCF does not cause GDPD" can be rejected for lags up to 5. The respective DW statistic values of 1.86 and 1.93 for the models support these conclusions. Therefore, it is concluded that CGDFCF does cause GDPD but not vice versa. The probabilities shown in Table 7 indicate that the null hypothesis "GDPD does not cause CCI" up to lag 2 cannot be rejected at the 5% level, whereas the null hypothesis "CCI does not cause GDPD" cannot be rejected for any lags. Thus, it is concluded that GDPD does cause CCI but not vice versa. The DW statistic value of 1.87 indicates that the residuals are not auto-correlated and thus the model is accepted.

Table 5. Causality between GDPD² and CVA²

Lag Length	GDPD² Does Not Cause CVA²		CVA² Does Not Cause GDPD²	
	F Statistics	Prob.	*F* Statistics	Prob.
1	1.42167	0.24190	2.16629	0.15083
2	0.91315	0.41249	0.82027	0.45027
3	1.17538	0.33821	0.75831	0.52766
4	1.12230	0.37034	1.47566	0.24208
5	1.51200	0.23067	1.05663	0.41304
6	1.34620	0.29109	0.45969	0.82836
7	3.61273	0.01951	0.43628	0.86342

Table 6. Causality between GDPD² and CGDFCF¹

Lag Length	GDPD² Does Not Cause CGDFCF¹		CGDFCF¹ Does Not Cause GDPD²	
	F Statistics	Prob.	*F* Statistics	Prob.
1	0.30710	0.58332	6.60690	0.0150
2	0.71116	0.49944	6.22659	0.0056
3	0.98857	0.41354	6.11313	0.0027
4	1.24627	0.31938	5.14313	0.0041
5	0.70637	0.62544	4.54295	0.0063
6	0.78163	0.59579	2.13252	0.1026

Table 7. Causality between GDPD² and CCI³

Lag Length	GDPD² Does Not Cause CCI³		CCI³ Does Not Cause GDPD²	
	F Statistics	Prob.	F Statistics	Prob.
1	17.7051	0.00228	2.20771	0.17149
2	5.33804	0.04658	0.46986	0.64629
3	3.81882	0.15009	0.80662	0.56801
4	NA	NA	NA	NA

Causality between BT¹ and CVA², CGFCF¹ and CCI³

The probabilities shown in Table 8 indicate that the null hypotheses "BT does not cause CVA" and "CVA does not cause BT" cannot be rejected for any possible lags except lag 7. The significant probability (0.01156) associated with the null hypothesis "BT does not cause CVA" for lag 7 indicates that the null hypothesis can be rejected. The corresponding DW values of 2.18 and 1.78 for the hypotheses confirm that the residuals are not auto-correlated. Therefore, it is concluded that BT causes CVA only for lag 7.

The probabilities shown in Table 9 indicate that the null hypothesis "BT does not cause CGDFCF" cannot be rejected at the 5% significance level for lags up to lag 4, whereas the null hypothesis "CGDFCF does not cause BT" cannot be rejected for any possible lags. It is therefore concluded that BT does cause CGDFCF for lags 5 and 6 but not vice versa. The corresponding DW values of 1.76 and 2.08 confirm that the residuals are not auto-correlated.

The probabilities shown in Table 10 indicate that the null hypotheses "BT does not cause CCI" and "CCI does not cause BT" cannot be rejected at the 5% level for any possible lags except lag 2 for the first of the two null hypotheses, i.e., that BT does not cause CCI. These results indicate that the null hypothesis can be rejected only for lag 2. Thus, it is concluded that BT does cause CCI for lag 2 and not vice versa. The corresponding DW value of 1.77 indicates that the residuals are not auto-correlated.

Table 8. Causality between BT and CVA[2]

Lag Length	BT Does Not Cause CVA[2]		CVA[2] Does Not Cause BT	
	F Statistics	**Prob.**	**F Statistics**	**Prob.**
1	1.33693	0.25614	1.43061	0.24045
2	1.38886	0.26546	0.50999	0.60579
3	1.20648	0.32702	0.30651	0.82043
4	1.78810	0.16563	0.94168	0.45766
5	1.71127	0.17804	0.66962	0.65100
6	1.34025	0.29340	0.39395	0.87275
7	4.12858	0.01156	0.51084	0.81180

Table 9. Causality between BT and CGDFCF[1]

Lag Length	BT Does Not Cause CGDFCF[1]		CGDFCF[1] Does Not Cause BT	
	F Statistics	**Prob.**	**F Statistics**	**Prob.**
1	0.20437	0.65418	2.83183	0.10185
2	0.91902	0.40985	1.77411	0.18697
3	0.66661	0.57987	1.82647	0.16615
4	2.14497	0.10623	2.13341	0.10773
5	3.05490	0.03164	2.67362	0.05071
6	4.84435	0.00415	1.72193	0.17315

Table 10. Causality between BT and CCI[3]

Lag Length	BT Does Not Cause CCI[3]		CCI[3] Does Not Cause BT	
	F Statistics	**Prob.**	**F Statistics**	**Prob.**
1	0.45888	0.51518	0.15628	0.70181
2	29.2586	0.00080	0.45222	0.65625
3	7.23194	0.06920	0.43803	0.74230
4	NA	NA	NA	NA

CONCLUSIONS

From a general perspective, the construction industry is considered an important sector in most economies. It contributes to general economic growth and is, in turn, affected by the conditions within any national economy. In this study, the causal link between construction and economic growth in Sri Lanka was examined using the Granger causality test. It is well documented in the construction economics literature that when an economy is booming, the construction sector also booms. Conversely, a slowdown in the economy slows down construction activities. Hence, a causal relationship between them could be postulated, although the direction of the causality is unknown. This type of information is useful in policy planning to prioritise investment opportunities.

In contrast to previous studies, this study considered the most appropriate of the available indicators to represent both the construction sector and the national economy. A summary of the results obtained from the Granger causality tests is given in Table 11. For all indicators except CGDFCF and GDPD, the cause–effect analysis reveals that the economy drives the construction sector and not vice versa. This supports the opinions of Tse and Ganesan (1997) and Yiu et al. (2004) that GDP tends to lead construction flow. The results contradict the opinions of Briscoe (1988) and Ofori (1990) that construction leads the national economy and that growth in construction precedes growth in GDP (Anaman and Osei-Amponsah, 2007).

Table 11. Causality between Construction and the National Economy

	GDP	GDPD	BT
CVA	GDP leads by one year	GDPD leads by seven years	BT leads by seven years
CGDFCF	GDP leads by two to four years	CGDFCF leads by one to five years	BT leads by five to six years
CCI	GDP leads by one year	GDPD leads by one to two years	BT leads by two years

This finding could be justified for a developing country such as Sri Lanka, in which construction activity is subject to fluctuations. During periods of rapid economic expansion, construction output usually grows faster than of the output of other sectors, but during periods of stagnation, the construction industry is the first to suffer. With the execution of major construction projects after the 1970s, the construction sector in Sri Lanka gained the status of a leading sector in the country's development. The opening of the economy in 1977 considerably increased investment in construction, but could only be sustained until 1982 (Karunatilake, 1987). Since 1983, protracted ethnic conflict has affected the growth of the economy and consequently, investment in construction has declined. However, there have been improvements since 2007 with the construction sector recording growth of up to 9% during 2007, an increase of 9.2% over the previous year (Central Bank of Sri Lanka, 2007). The Central Bank of Sri Lanka has suggested that this growth in the construction sector resulted from the positive contributions of the government and the private sector. The findings of the current study therefore suggest that the government, being the major client of the construction industry (contributing nearly two thirds of the total annual output in construction) could use the construction sector as an economic regulator, reducing construction demand by cutting back on construction projects or investment funds when the economy is overheating and stimulating construction investment during periods of unemployment and slack demand. Thus, the Sri Lankan government could prioritise investment to increase economic growth and optimise the use of the construction sector. Although this study has focused on a variety of indicators to assess the presence and nature of the causal relationship between the construction sector as a whole and the economy in Sri Lanka, it is believed that the different sub-sectors within the construction industry could react differently. Thus, a further study could investigate the impact of investments in different construction sub-sectors on the national economy.

NOTES

1. First difference
2. Second difference
3. Third difference

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