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Causal relationship between construction investment policy and economic growth in Turkey

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ABSTRACT

The construction industry in countries experiencing severe economic crisis has vital importance to get out of stagnation because of its direct relations with 200 different sectors. In this study, the relationship between the construction growth data (infrastructure, building and residential (public), building and residential (private) investment) and gross domestic product (GDP) is examined for Turkey. To this end, Engle–Granger cointegration, error correction model (ECM) and Granger causality tests were applied in order to determine the aforementioned relation. It has been found that the infrastructure and building–residential investments have direct relations with the GDP and have causality effects.

1. Introduction

The construction sector is regarded as a significant factor influencing economic policies in developing countries like Turkey. The sector has backward and forward linkages with other sectors.

Countries utilize their construction sectors as regulation lever. That is, they tend to reduce the number of construction projects and cut off funds fostering this sector when their economies enter a very rapid growth pace; and revitalize the construction sector when their economies suffer from demand shortage and when unemployment rate increases. These frequent fluctuations in demand level are the most significant bottleneck of the sector. Construction sector, made up of building and residential activities, has undertaken a key role in transition from economic stagnation to growth by means of the inputs it utilizes and employment it creates. According to Intes [1], construction sector acts as a key and driving sector which has established relation with more than 200 sub-industries or sub-sectors. In an analysis of the construction sector's production value (inputs supplied from other sectors and value added created), the share of inputs supplied from other sectors is calculated to be 59% and that of the value added is 41% in its production value. According to an input–output analysis conducted by the Turkish Statistical Institute, residential construction receives input from a total of 24 fundamental sectors, namely from 3 main production, 15 manufacturing and 6 service sectors.

The country classification in the World Economic Outlook divides the world into three major groups: high income (developed economies), middle income and lower income (developing). Turkey is classified as a developing country by [2,3]. The construction sector is regarded as a significant factor influencing economic policies in developing countries like Turkey. The present study analyzes the relations among construction growth items (infrastructure, building and residential (public), building and residential

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(private) investment) and gross domestic product (GDP) within the 1987–2008 period in Turkey. The study differs from other studies in literature by introducing categorization into three different selection groups, such as infrastructure, public and private investment. Most studies in the literature study only one of these groups. Moreover, Ofori [4] stated that private sector involvement in the provision of infrastructure and other major construction projects require the attention of researchers on construction in developing countries.

2. Literature review

Ofori [5] highlighted that international construction forms a significant proportion of the total global volume, and has implications for the construction industries in all countries. The construction industry plays an important role in economic growth in every country for four reasons. First, this sector significantly contributes to gross domestic product [10]. Second, it interacts with their industries while creating its products and services. Third, the sector mainly employs unskilled and/or semi-unskilled workers influencing the rate of employment [6]. Fourth, when the construction market is uprising, real estate assets prices increase resulting in more wealth/increased capacity to receive loans for their owners. When on the other hand the real estate market declines, the opposite process results in economic stagnation or even recession [7]. Thus, the effect of construction on the economy through the production process and through the effects of credit constraint can be as important as the effect of the economy on the construction sector [8].

Low [9] argued that the construction industry has a direct bearing on the national economy and, consequently, can be used as an indicator of economic well-being for a country. In addition, Low [9] suggested that the relationship could be found in terms of capital formation and employment creation as well. He found that in most developing countries the capital formation in construction accounts for 7–13% of the GDP while that of most industrialized countries ranges between 10 and 16%. Further, he proposed that construction provides 6–10% of total employment in most industrialized countries and 2–6% in less developed countries.

The relationship between economic growth and construction sector was studied by Turin and Hillebrant in 1970s [4]. After 1970s, there are many studies by various researchers [4,5,10–18]. Wigren and Wilhelmsson [19] point out that investments (not only construction investments) play an important role in short term economic growth whereas infrastructure investments are vital in long term growth. Esfahani and Ramirez [20] claim that the relationship between infrastructure investments and GDP is arguable although their study revealed the effects of infrastructure investments on growth. Studies by Aschauer [21,22], Easterly and Rebelo [23], Canning et al. [24] and Sanchez-Robles [25] indicate that construction investment exerts positive effects on growth.

Nijkamp and Poot [26] examined 123 studies addressing the impacts of fiscal policies on growth via meta-analysis. In their study, they sought the effects of governmental fiscal policies on long term GDP. Approximately 40 out of 123 studies revealed a relationship between public investment and GDP. While 72% of these studies revealed positive effects, 8% revealed negative ones. Crosthwaite [27] examined the relationship between construction investments and growth in 150 countries and classified countries as underdeveloped (48), developing (77) and developed (25) according to World Bank categorization criteria. Crosthwaite's study revealed that construction investments in underdeveloped countries have the strongest effect on GDP, followed by those in developing and developed countries. These findings emphasize that the effects of construction investments on growth remain at a minimum level in developed countries.

Wigren and Wilhelmsson [19] analyzed direct or indirect effects on GDP of building, residential and infrastructure investments in 14 EU member states. They concluded that governmental infrastructure investments have positive effects in the short term but in the long term, they are poor. Residential investments – on the other hand – have impacts on growth in the long run.

3. Economic model and methodology

3.1. Data collection

The present study makes use of construction growth items (Infrastructure investment, building and residential (public) (BRPU), building and residential (private) (BRPR) investments) and GDP monthly data. Data has been gathered from the databases of the Central Bank of Turkey. GDP refers to the prices between January 1987 and December 2008 by taking into consideration the expenditure data within this period. Infrastructure and BRPU refer to a comparison of the prices for the expenditure data of the 1987:01–2008:12 period as announced by the state. BRPR includes the expenditure data of the 1987:01–2008:12 period gathered by the private sector. Values are given in New Turkish Lira. In the analysis stage, logarithmic values pertaining to series were used and series have been cleared off seasonal effects as well as the trend effect.

3.2. Methodology

Series' stationary structures were analyzed via Augmented Dickey Fuller (ADF) unit root test. Engle–Granger cointegration test was employed in order to reveal a possible cointegration between series. Following the identification of cointegration between series, the error correction model concerning variables in causality relation was analyzed. Finally, Granger causality test was applied in order to define the direction of causality among series.