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**Causal relationship between Foreign Direct Investment and Economic Growth in Turkey**

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# ABSTRACT

Although there is a considerable evidence on the link between Foreign Direct Investment (FDI) and economic growth in developing countries, the causal relationship of these two variables still remains an important question. This study attempts to examine the possible causal relationship between FDI and economic growth in Turkey, during the period 1992 (Quarter 2) – 2006 (Quarter 3). We employed the Johansen Cointegration and Granger Causality tests for detecting the long run or short run causality. Our results showed that there is no long run relationship between the variables, which led us to search the causality in the short run. However we couldn't find any evidence for a causality running from FDI to economic growth or economic growth to FDI in Turkey.

**Key Words:** Foreign Direct Investment, Economic Growth, Causality

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**INTRODUCTION**

Economic growth in a country can be attributed to different factors such as technological progress, capital accumulation, employment growth and the quality of institutions in that country. Foreign direct investment (FDI), which is defined as direct investment in business operations in a foreign country has the potential to generate employment, raise productivity, transfer managerial skills and technology. Thus there is a general agreement about the positive impacts of FDI, on the development process and economic growth of host countries.

According to UNCTAD (2001), because of its increasing importance, FDI inflows in the world rose from $57 billion to $1271 billion during 1982 – 2000. Although a large portion of world FDI is hosted by the developed economies, FDI flowing into developing countries also increased rapidly over the years, rising from an annual average of $13.1 billion during 1981–1985 to 334 billion in 2005 (UNCTAD, 1994, 2006). It is not surprising that most of the developing countries are trying to attract FDI with new economic policies (Michalet, 1999).

Especially during the last decade, many studies have been performed on the role of FDI in stimulating economic growth. The macro empirical literature about the relationship between economic growth and FDI has shown that, the effects of FDI on the economic growth is country specific, and depends on different factors. Balasubramanyam et al. (1996), using cross country data for 46 developing countries over 1970-1985 period found that, the trade openness is essential for acquiring positive growth effects of FDI. De Mollo (1997) stated in his study that, positive contribution of FDI to economic growth depends on technological conditions in the host country.  Another study for the developing countries by Borenstein (1998), using cross country data for 69 developing countries over different time periods; 1970-1979 and 1980-1989, suggested that FDI effects economic growth positively only in the countries that have sufficient human capital and qualified labor force. Some of the recent studies also have found similar results. Chanda, Kalemli-Ozcan and Sayek (2004), Durham (2004), and Hermes and Lensink (2003) suggested that only countries with well-developed financial markets, may capture positive growth effects of FDI.

However, according to the micro empirical literature, firm-level studies of particular countries mostly found that FDI does not enhance economic growth in developing countries, while it does in the developed ones. For instance, Aitken and Harrison's (1999) study for a developing country, Venezuela, did not find any evidence for a positive technology spillover from multinational firms to domestically owned ones, whereas Haskel, Pereira and Slaughter (2002), found significant positive spillover effects for developed countries.

Even if we agree on the positive impact of FDI on economic growth, there is still a question about the causality issue, does FDI causes economic growth or does a growing economy attract the FDI inflows? Zhang (2001) analyzed the causality between FDI and economic growth for 11 developing countries in East Asia and Latin America for the period 1970 - 1995. By performing cointegration and Granger causality tests, his results showed that, there was a long run relationship (cointegration) between the FDI and GDP for 5 countries, in which the economic growth was enhanced by FDI. For the remaining six countries where there was no long run relationship between FDI and growth, only one of these countries exhibited short run Granger causality from FDI to growth. Choe (2003) used the traditional panel data causality testing in his analysis for 80 developed and developing countries, for the 1971 – 1995 period. His results indicated that there was a bi-directional causality between FDI and growth, though the effect from FDI to growth was weak.

In this paper, we aim to explore the causality between FDI and economic growth for Turkey. The reason that we have chosen Turkey is, to the best of our knowledge, not many studies have been performed to explore the causal relationship between FDI and economic growth in Turkey. Moreover, most of the surveys, as we will discuss in the first chapter of this thesis, have analyzed the relationship between FDI and economic growth with aggregated data for several countries together, not for just one specific country.

We will use the following econometric methodologies to assess the empirical link between FDI and economic growth. Firstly we will examine the stationarity properties of the univariate time series by the Augmented Dickey Fuller (ADF) (1979) unit root test. Secondly, time series will be examined by Johansen (1988) cointegration test, to identify the probable long-run relationships between two variables. The third and the final analyze will be the Granger causality test for detecting the direction of causality between FDI and economic growth.

With the purpose of investigating the relationship between economic growth and FDI empirically by causality tests, the first chapter of the paper will give a theoretical background regarding the FDI and economic growth, while the second chapter will briefly summarize Turkish economy as well as its FDI and economic growth performance over time. The third and fourth chapters will include empirical analyses and estimation results, and the final part concludes this study.

## 1. ECONOMIC THEORY

### "FDI led growth" hypothesis

A large number of empirical studies for identifying the role of FDI in host countries indicated that FDI can effect the host countries economic growth through several ways. Not only FDI is effecting growth directly by contributing to gross fixed capital formation, but also effecting with indirect ways such as transfer of technological and business know-how. These technology and knowledge transfers may have substantial spillover effects for the entire economy. Furthermore when foreign firms enter the market, the competition with domestic firms may crowd out some of the demand for local investment. Hence with direct and indirect channels, FDI may play an important role for economic growth.

However the effects of FDI to economic growth seem to be country specific; depends on different factors such as the level of per capita income, trade openness, technological conditions and qualified labor force in the host country. (Balasubramanyam et al.(1996), De Mollo(1997), Borenstein(1998))

There are many surveys that we can refer, to better understand the causation of FDI to economic growth. Zhang (2001) analyzed the causality between FDI and economic growth in 11 developing countries in East Asia and Latin America during the period 1970 - 1995. His results indicate that, by performing cointegration and Granger causality tests, there is a long run relationship between the FDI and GDP for 5 countries, and economic growth is enhanced by FDI in these countries. Another paper by Nair-Reichert and Weinhold (2001) tested causality for cross-country panels, using data from 1971 to 1995 for 24 countries. They find that FDI on average has a significant impact on growth, although the relationship is highly heterogeneous across the countries.

### Hypothesis of "growth- driven FDI"

The hypothesis of "FDI led growth"; we mentioned before suggests that, FDI may enhance the factors such as human capital, technology and investments which are playing an important role in promoting economic development. However the causality may be in the other direction; rapid economic growth may attract FDI. The "growth – driven FDI" hypothesis emphasizes that a country should have a growing market size and improving conditions in human capital and infrastructures to attract FDI (Zhang, 2000). The accumulation of qualified human capital, increased market size and occurred better infrastructure through economic growth of host countries, offer a better investment environment and high profits opportunities to the MNE's, which encourages investments.

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In his paper, Zhang (2001) also found that there is a positive causality running from GDP to FDI for Brazil, Korea, Malaysia and Thailand in the short run while that positive causality exists for Colombia, Mexico, and Indonesia in the long run. Another study by Moudatsou (2003), attempted to address the causal order between FDI and economic growth for 14 European Union countries, found that economic growth causes FDI inflows in Italy, Finland, Spain and Ireland for the period 1970 – 1999. Chakraborty and Basu (2002) examined the causality between FDI and output growth in India. Using annual data from 1974 to 1996, they found that the real GDP in India is not caused by FDI, the causality runs more from real GDP to FDI.

### Hypothesis of feedback

New studies have also considered the possibility of a two-way (bidirectional) causality between FDI and economic growth. In other words, not only FDI can cause economic growth, but growth can also affect the inflow of FDI. Countries with rapid economic growth, offer opportunities for making profits and that generates more demand for FDI. On the other hand, FDI inflows may enhance economic growth of host country through direct and indirect ways as we mentioned before. So, in this case we may expect a reciprocal causal relationship between FDI and growth.

According to the findings of Choe (2003) using a large sample of 80 countries, there is an evidence of a two-way causality between FDI and economic growth but the effect is more apparent from growth to FDI. Chowdhury (2003) in his paper tested the direction of causality between FDI and growth for three major FDI recipients, Chile, Malaysia and Thailand, for the period 1969–2000. He concluded that in the case of both Malaysia and Thailand, there is strong evidence of a bi-directional causality between GDP and FDI. Also, Zhang (1999) found the evidence of a two-way Granger causality relationship between FDI and China's economic growth.

## 2. TURKISH ECONOMY

### General outlook

Turkey, situated between Asia and Europe, is the largest economy in the region; in Eastern Europe, the Balkans, the Black Sea basin and the Middle East. She is the European Union's sixth biggest trading partner and the world's 7th largest emerging economy. She has a population of 73 million and the population growth rate is around 1,5 percent. The population is much younger compared to European countries, around 70 percent of the population is below age of 35 and countries civilian labor force is 24.3 million people as of end of 2004.

Turkey follows a liberal policy in economy just as in its political structure today. The liberalization process started in early 1980s with many structural reforms. These reforms lead country to establish a market economy and export-oriented industrialization which were including mainly, reducing the weight of public sector in the economy with privatization, liberalization of the financial system, removing restrictions in foreign currency and interest rates, devaluation of the Turkish lira, re-organizing the body of Istanbul Stock Exchange and activating it, and encouraging both foreign and local investments with tax incentives. The reforms continued with gradual move into trade liberalization in 1984 and concluded with financial liberalization, lifting of repressive controls on financial markets in 1989.

Until the time structural reforms started, the Turkish economy was mainly based on import, and focused into agriculture sector. After reforms, the country shifted from agrarian to industrial economy. While the agriculture sector constituted 24,2 percent of GDP in 1980, as of 2005 this sector accounted for about 11, 4% of the GDP. However Turkey is still the largest producer and exporter of agricultural products in the Middle East. The sector is employing the largest percentage of the population; approximately 35% of the people earn their living by agriculture and stockbreeding.

Industry sector is one of the important components of the Turkish economy now, as of 2005, constituted about 29 percent of the countries GDP. The textile sector is the countries largest manufacturing industry and the largest sector in export. It constituted 19 percent of total exports in 2005, and employed 10 percent of total work force. According to the World Trade Organization's (WTO) 2002 Report, Turkey is the fourth largest clothing exporter in the world. Other important sectors of Turkish industry are defense, electronics, iron and steel, automotive, glass and sugar industries. The automotive and electronics are rising in importance within Turkish export; in 2005 exports of automotive sector constituted 18 percent of total exports, while iron and steel had 13%, white goods 10%, chemicals and pharmaceuticals 9%, and machinery had 7% share in the export portfolio of the country.

The effect of 1980 reforms to both the volume and composition of the Turkish trade is extremely significant. While the volume of total trade was averaged at around 20 billion US dollars in 1980s, this volume reached to 190 billion USD in 2005, exceeded 50 percent of the GDP (As of 2005, according to IMF, GDP was 353 billion U.S. dollars). Also the total volume of exports has grown from 2.9 billion USD in 1980 to 85 billion USD in 2006. Furthermore, in 1980s Turkish exports had mainly been composed of agricultural products, however in recent years the manufactured goods constitute the largest part; around 90 percent of Turkish exports.

Turkey was ranked 23rd largest exporter in 2005, and the country was the 14th largest importer in the world that year. The countries significant performance in export, also seen in import figures, total import rose to about $130 billion in 2006 while it was only 8 billion in 1980. Intermediate goods constituted about 60 percent of overall imports, while capital goods constituted about 15 percent in 2006.

The EU is Turkey's primary trading partner (about 52 percent of exports and 42 percent of imports as of 2005), followed by the United States, Russia and Japan. Turkeys customers are, Germany; the main partner country with its share about 13% in total exports, followed by UK with the share of 8%, US 7%, Italy 7%, France 5%, Russia, and Spain 4.2% in total exports of Turkey. Turkeys import partners are Germany; with the share of 12%, Russia 11%, Italy 7%, US 6%, France 5%, UK 4.4% and China with 4.6%.

Service sector in Turkey has the highest share in the national income and comprised about 60% of GDP in 2005. The major branches in this sector are tourism and financial services. Turkey has made substantial investments and gained important benefits from tourism in the last twenty years. With the promotion policies and providing high level services to the visitors, the sector attracted the wealthy tourists and rapidly increased its share in the economy. In 2005 there were about 24 million foreign visitors in the country and the sector contributed 18.2 billion USD to Turkey's revenues.

The Central Bank of the Republic of Turkey was founded in 1930 which has 25 domestic branches and also branches in New York, London, Frankfurt, and Zurich. In 1998 there were 72 banks in the country, after the severe financial crisis in 2001, for which the banks were partly responsible, the number of bank decreased to 31 by the new banking system in the country.

After the country experienced that severe financial crisis in 2001, Turkish government started to work with IMF and the World Bank for a structural program, with the aim of stabilizing and strengthening the economy. With the help of this reforms Turkish economy rebounded very strongly, inflation and interest rates have fallen dramatically, moreover annual growth of gross national product (GNP) has averaged more than 7.5% in 2002-2006 period. Per capita GDP increased from 2123 dollars in 2001 to a historical record level of 5,062 USD, and Turkey ranked 64th in the world in 2005.

However the problems of unemployment rate, which is at about 10 percent and poor income distribution, still exists. If population is ordered in terms of wealth and saying that the "top" being the richest and the "lower end" being poor, 46.2 percent of the total disposable income was shared among the top 20%, while the lower 20% received only 6 percent of the total disposable income (2004). Furthermore, the high deficits and debts are the main problems in the economy now. The large government debt was at historical level, about 70 percent of GDP at end of 2006 and the trade and current account deficits were at historical high levels of 10% and 8% of GDP (OECD 2006). These deficits are trying to be financed by FDI which increased significantly during 2005 - 2006, with the large scale of privatization and acquisitions in the financial sector.

While the country still has those problems as we mentioned, "The healthy growth in the economy, falling inflation rates and governments tight fiscal policy has made the Turkish economy more robust and resilient to shocks" (European Commission). Today, the country is fully integrated with the global system both in trade and finance. State interference in the economy has been reduced in recent year's, furthermore important markets; such as electricity, telecommunication, sugar, tobacco and petroleum, have been liberalized.

### 2.2 Economic growth and FDI performance of Turkey over time

Turkish economy suffered much from World War 1 and Ottoman Empire's War of Independence (1919-1922), but started to recover after the foundation of Turkish Republic (1923). Increase in agricultural output by 8.5 %, growth of GNP by 10.9 %, and successful performances in industry and services sectors continued until World Depression (1929). After depression, during 1930-1940 periods, the economic growth started to decline, moreover in 1940s the country faced the 2nd World War, and not surprisingly the economy stagnated because of the increased military expenses and declined output level.

Until 1980s, the country followed an inward-oriented growth strategy. The government encouraged public investments in these years, especially the manufacturing sector, to achieve industrialization and economic development. In 1970s the public sector investment and exports increased rapidly but the increase of exports resulted with a balance of payments crisis in the country. Therefore the government started to implement a stabilization package with IMF guideline.

The crisis continued with the high oil prices in the world in 1973-74. The economic policies, by authorities in that period, aimed to finance the resulting deficits with short-term loans from foreign lenders but couldn't be successful. As end of 1970s the result of crisis was awful; triple-digit levels in inflation rate, an unemployment rate at 15 %, an industry using only half of its capacity and a country no longer to pay even the short term-debts. Not surprisingly the gross national product (GNP) decreased by 0.5 percent in 1979 and by 2.8 percent in 1980.

Before 1980s, the countries attitude to Foreign Direct Investment was conservative; it was a relatively closed country to foreign companies. Although Turkish government formed a law regarding foreign investments in 1954, called "Foreign Investment Law", the country couldn't attract the foreign investors because of instability in the economy and that unsuccessful law. In 1971-1980 periods, the total amount of foreign direct investments to Turkey was around $100 million, and until 1980's since its foundation, the cumulative FDI was far below the desired levels, only $228 million.

Structural reforms in the country in 1980, which is known as January 24, 1980 Decisions; we mentioned in previous section (General Outlook to Turkish Economy) led Turkey to form a free market economy, and adopted a more outward-oriented export-led development strategy.

These reforms were also supported by IMF, OECD, World Bank and it was a necessary step toward globalization; which resulted with significant progress in the liberalization of trade, investment policies and macro-economic stability. The decisions also overcame the balance of payments crisis which occurred in late 1970s, reestablished Turkey's ability to borrow from foreign lenders. The three digit inflation rate in 1980 was reduced to an average of 25 percent in 1982, and the country had substantial increase in FDI and economic growth in the following years. Annual FDI flows in Turkey grew rapidly from the mid-1980s reached about $1 billion in the early 1990s, with the help of reforms, and outside developments such as the changes in Eastern Europe and Soviet Union. Also real GDP and exports in dollar terms rose by 5.4 % and 19.7 % per annum respectively in 1983-1987 period.

However, achieved high growth rates with the help of exports during 1983 - 1987 caused to depreciate domestic currency (Turkish Lira), moreover the governments export subsidies reached its economic and political limits in 1988. Due to these main reasons and high inflation rates which steadily increased after 1984, the instability in the economy has risen again. Although the government's restrictive fiscal and monetary policies in 1988 aimed to fight against that high inflation rates, it continued to increase up to 70 percent during 1988 – 1989, furthermore these anti-inflationary policies caused considerable decline in public investments and consumption expenditures. Due to these improvements, after high economic growth rates in 1983-1987 period in the country, real GDP growth in 1988 and 1989 has slowed down and decreased to 3.7 % and 1.9 % respectively.

The dynamics of the growth performance of the economy after 1989 can be linked to unsuccessful policies for reducing the inflation and debt financing. In 1989 Turkey started the populist policies, tried to finance the deficits mainly with the help of short term capital inflows-so called "hot money". Government's deficit financing policy and its attempts to prevent the inflationary effects of rising exchange rates were unsustainable within the short period, thus this strategy resulted with the deteriorated fiscal balances, erratic movements in the current account, a rising trade deficit and decreased export growth in the 1990s. Although the economy had high growth rates in 1992 and 1993, all these problems led Turkey to experience the severe financial crisis in early 1994. The current account deficit reached a record level to 6.4 billion U.S. dollars in 1993 and Turkish Lira depreciated by more than 150% against U.S. dollars in 1994, also the inflation rates increased sharply.

Foreign Direct Investments in 1990s, which grew rapidly from the mid-1980s, stagnated because of the macroeconomic uncertainty in the country and any realized progress for attracting FDI by government. To better understand the position of Turkey in global FDI activity in 1990s, we may compare the country with its competitors. Loewendahl (2001), interviewed with 30 senior MNC executives in Turkey to identify the countries competing with Turkey for FDI. Over the 70% of respondents thought Eastern Europe was a key competitor for FDI in Turkey, followed by North Africa, Russia & CIS, and Greece. As we can see from the Table 1, after 1992, using balance of payments FDI data provided from UNCTAD, Turkey's performance was worse than its competitors such as Poland, Hungary and Czech Republic.

Table 1: FDI in Turkey and 9 Competitor Locations; US$million / per annum

|  | 1987-92 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | Total | %of total | Total FDI/GDP* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Poland | 183 | 1715 | 1875 | 3659 | 4498 | 4908 | 6365 | 7500 | 30520 | 25.99% | 19.25% |
| Russia | na | 1211 | 640 | 2016 | 2479 | 6638 | 2761 | 2861 | 18606 | 15.85% | 6.73% |
| Hungary | 675 | 2339 | 1146 | 4453 | 2275 | 2173 | 2036 | 1944 | 16366 | 13.94% | 34.23% |
| Czech | 533 | 653 | 869 | 2562 | 1428 | 1300 | 2720 | 5108 | 14640 | 12.47% | 25.97% |
| Israel | 187 | 429 | 432 | 1337 | 1382 | 1622 | 1850 | 2256 | 9308 | 7.93% | 9.26% |
| Greece | 938 | 977 | 981 | 1053 | 1058 | 984 | 700 | 900 | 6653 | 5.67% | 5.51% |
| **Turkey** | **578** | **636** | **608** | **885** | **722** | **805** | **940** | **783** | **5379** | **4.58%** | **2.71%** |
| Romania | 61 | 94 | 342 | 420 | 265 | 1215 | 2031 | 961 | 5328 | 4.54% | 13.96% |
| Egypt | 806 | 493 | 1256 | 596 | 637 | 888 | 1077 | 1500 | 6447 | 5.49% | 7.79% |
| Slovakia | 91 | 168 | 245 | 195 | 251 | 206 | 631 | 322 | 2018 | 1.72% | 9.91% |
| Bulgaria | 34 | 40 | 105 | 90 | 109 | 505 | 537 | 770 | 2156 | 1.84% | 17.59% |
| Total | 4086 | 8755 | 8499 | 17266 | 15104 | 21244 | 21648 | 24905 | 117421 | 1 | 10.55% |

Source: Derived from UNCTAD(1999;2000); World Bank (2000) * 1998 GDP data

While in 1994-1998 period, Global FDI rapidly increased by 238 percent in developed economies and by 98 % in developing economies, Turkey realized FDI inflows far below the desired levels. On average, during the 1970s, it has attracted a net FDI flow that is 0.1 percent of GDP and it was only 0.44 percent in the 1990s when global FDI flows reached top levels. In 1996, Turkey signed the "Customs Union Agreement" with EU which provided the manufactured goods to move freely between Turkey and the EU respectively but it didn't make the expected positive effects to FDI inflows. Also, as Table 2 indicates, Turkey has performed worse than every region in the world relative to the size of its economy.

Table 2: The role of FDI in the key regions of the world

|  | FDI inward stock/GDP(%) 1998 | FDI inward stock/capita($) 1996 |
|---|---|---|
| Developing Europe | 15,7 | 347 |
| Asia and the Pacific | 20,2 | 150 |
| West Asia | 7,6 | 259 |
| Central Asia | 25,6 | 71 |
| South, East and South East Asia | 23,3 | 143 |
| Pacific | 29,4 | 618 |
| Central and Eastern Europe | 12,1 | 151 |
| Hungary | 33,2 | 1490 |
| Czech Republic | 26,1 | 537 |
| Poland | 15,1 | 339 |
| **Turkey** | **3,8** | **92** |

Source: UNCTAD (1998)

After the economic crises in 1994 the inflation rates increased sharply to 106 percent due to the huge depreciation ratio of the Turkish lira. As we mentioned before, the policy attempts by governments for reducing the inflation, were not successful since 1980s. Thanks to IMF-based stand-by agreement which is done in 1994, the inflation rate fell to 89 percent after the crisis was overcome. However the crisis resulted with the decline in real GDP by 5 % in 1994 after the high growth rates in 1992 and 1993. This 5 percent decline was the worst performance in the Turkish economy over the 1963-1999 periods.

During 1995-1997 periods although the country did not continue to sign any agreements with IMF and there was no serious attempt by governments to stabilize the economy and to reduce the high inflation rates, economic growth averaged over 7 percent by expansion of private investment and output. After 1997, the government succeeded to reduce the inflation rate and fiscal imbalances, but economic conditions began to decline again because of the Russian crisis in August 1998, the general elections in April 1999 and devastating earthquakes in the same year. All these reasons led the economic contraction to be very high, the GDP growth was -6.1% in 1999.

After the general elections in April 1999, the government started to implement a stabilization program with IMF again which mainly aimed to solve public sector imbalances, reduce high inflation rates and prevent any expected crisis. However, the country had 2 severe crises unexpectedly after first half of 2000; the liquidity crisis in November 2000 and banking crisis in early 2001 which led the government to take an important decision, shifting to fluctuating exchange rate. In 2001 real GDP declined by about 7 percent which is the worst performance the country had ever seen.

In May 2001, Turkey signed another agreement with IMF to support the economic program. With the implementation of this stabilization program, the country had fundamental changes in both monetary and fiscal policies and these successful policies resulted with significant improvements in economic conditions. The inflation fell to a single digit for the first time in 30 years, 9 percent in 2004 and 7.7 % in 2005. In 2002, 2003 and 2004 GDP recovered by around 8, 6 and 9 percent respectively, this made Turkey the fastest growing economy in the OECD. Over the 2002-05 period, output increased by a third, this performance was also the strongest among OECD countries. (OECD 2006)

The crisis affected negatively FDI inflows until 2004. Total FDI into Turkey in 2001 was the record level for the country in its history; $3.3 billion, but the big part of total amount constituted by the Isbank-Tim consortium (Telecom Italia and Turkeys biggest private bank) for the infrastructure to establish the third GSM mobile company in Turkey.

However, with stability programs in the economy with IMF, started after 2001 crisis and new government's large scale privatization decisions; for instance privatization of Turk Telekom, the FDI inflows to the country reached record levels after 2004. While the total amount of FDI inflow was around 14 billion dollars between 1980-2003 periods, the realized inflow in 2004 was $1,3 billion, $8,5 billion in 2005 and finally rose to about $19 billion by the end of 2006 and Turkey became the 9th largest FDI recipient in this year. The EU Councils decision in 2004 was to start negotiations with Turkey for the countries membership to European Union, and structural changes in the banking, retail, and telecommunications sectors have all contributed to experience this record levels in foreign investments.

If we talk about the countries investing in Turkey; for the period of 1980–2002 we see that Germany, France and the Netherlands were the chief investors in Turkey, followed by the United States, the UK and Italy. In terms of the number of companies, EU companies have the largest number, in 2006 Germany was the leading country with 2600 companies, followed by the UK with 1400 companies and Netherlands with 1100.

As of 2000 end, 45 percent of FDI stocks in Turkey were flowed into service sectors, transport and telecommunications, banking and financial services attracted the most part of these inflows. Other sectors that attract highest FDI amounts are automotive, petrochemicals, and rubber& plastic goods sectors. The share of the service sector in the last years increases in line with increasing FDI inflows with the help of M&As, as can be seen in Table 3. While 74 percent of FDI inflows have gone to service sector in 2004, this figure was realized as 91 % in 2005.

Table 3: Sectoral distribution of FDI inflows (million$)

| Years | Manufacturing | Services | Other Sectors | Total |
|-------|---------------|------------|---------------|-------|
| 1995 | 388 (41%) | 534 (57%) | 12 (2%) | 934 |
| 1996 | 424 (46%) | 467 (51%) | 23 (3%) | 914 |
| 1997 | 349 (41%) | 456 (53%) | 47 (6%) | 852 |
| 1998 | 553 (58%) | 362 (38%) | 38 (4%) | 953 |
| 1999 | 353 (37%) | 362 (38%) | 38 (25%) | 953 |
| 2000 | 932 (54%) | 763 (45%) | 12 (1%) | 1707 |
| 2001 | 932 (27%) | 2439 (72%) | 3 (1%) | 3374 |
| 2002 | 178 (28%) | 442 (71%) | 2 (1%) | 622 |
| 2003 | 536 (72%) | 195 (26%) | 14 (2%) | 745 |
| 2004 | 237 (19%) | 928 (74%) | 80 (7%) | 1245 |
| 2005 | 711 (8%) | 7651 (91%) | 47 (1%) | 8409 |

Source: Central Bank of Turkey (2006)

Although the FDI inflows had significantly increased in recent years, as we mentioned before, those inflows was still far below the desired levels. Several international and private sector specialists think that Turkey should attract more levels of FDI. According to UNCTAD 2002 report minimum annual attraction potential of Turkey is about USD 35 billion.

## 3. DATA and METHODOLOGY

### 3.1 Data

The data, used to find the relationship between economic growth and foreign direct investment, is quarterly compounded for the period 1992 (Quarter 2) – 2006 (Quarter 3). This period was chosen because of the availability of data and significant effects of the economic reforms which has done after 1980s in Turkey.

The data was taken as monthly for FDI inflows from Turkish Statistical Institute and quarterly for GDP from Ecowin. We used 1987 prices as a base year for GDP and transformed both variables into logarithmic forms. The GDP growth rates calculated as simply taking the differences of;

**Equation (1):** GDP growth$_{t2}$ = LGDP$_{t2}$ – LGDP$_{t1}$;
where LGDP is the logarithm form of GDP

The variables used in the analyzes have been denoted as follows;

FDI    : logarithm of Foreign Direct investment inflows
GDP    : logarithm of Gross Domestic Product
GDP growth : Gross Domestic Product growth rate
dFDI    : first difference of FDI
dGDP    : first difference of GDP growth

All data used in this study analyzed and tested by using JMULTI; econometric software developed by Alexander Benkwitz and supported by Markus Krätzig (2000).

### 3.2. Methodology

With the purpose of finding the causal link between economic growth and FDI in this study we will run the following tests:

1. Unit root test
2. Cointegration test
3. Causality test

### 3.2.1. Unit root test

Since most of the economic variables are non-stationary, stationary should be reached for avoiding the spurious and misleading results. If a series contains a unit root, it is said non-stationary. A widespread and convenient way to remove that non-stationary is taking differences of the variable. A non-stationary series which has to be differenced *d* times to become a stationary one, is called integrated of order *d* and denoted as I(*d*) and contains *d* unit roots.

We will perform the Augmented Dickey-Fuller (ADF) test, to check the unit root properties of the time series and to find the right order. The test statistics was based on the non-standard Dickey Fuller distribution. The ADF test can be expressed in general terms;

**Equation 2:** $y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{i=1}^{k} \beta_i y_{t-1} + \varepsilon_t$ ;

Where; $y_t$ is the series in levels, k is the optimal number of lags; that is a number large enough not to allow for the existence of autocorrelations in the residuals. $\varepsilon_t$ is the error term and it is assumed to be a white noise process; zero mean, constant variance and no autocorrelation.

To determine the optimal lag length (k) of the model we used the Akaike Information Criterion (AIC). The ADF test's hypotheses are:

$H_0$: $y_t = 0$ which implies that series are integrated of order one I(1) and a non-stationary variable.

$H_1$: $y_t < 0$ which implies that series are integrated of order I(0) and a stationary variable.

If we accept the null hypothesis, we conclude that there is a unit root; higher order of integration should be tested for unit root until rejection of the null hypothesis.

### 3.2.2. Cointegration

The theory of cointegration, deals with the long run relationship between the time series which are non-stationary in levels. In other words, a long-term relationship means that the non-stationary variables are cointegrated if they move together and converges to equilibrium over time. Thus, even if relevant time series themselves are non-stationary, a linear combination of them may be stationary; this combination is called the cointegration equation and includes cointegration vector.

There are many tests for cointegration; we will use Johansen's (1988) procedure, which is based on Vector Autoregressive (VAR) model. The model can be stated as:

**Equation 3**: $x_t = A + \sum \Pi_i x_{t-i} + \varepsilon_t$ ;

Where $x_t$ is a (nx1) vector of non-stationary variables, A is (nx1) matrix of constants(intercept), $\prod$ is (nxn) matrix of coefficients or parameters, $\varepsilon_t$ is a (nx1) vector of error terms which assumed to have a white noise process and normal distribution, and finally "i" is the lag order. The Johansen's approach provides two different likelihood ratio tests; we will use the Trace test in our study in order to determine the number of cointegrating vectors.

### 3.2.3. Granger causality test

Regression analysis deals with the dependence of one variable on other variable only, does not prove causality or the direction of influence. The Granger causality test, developed by the Nobel Price winner Clive Granger, is performed in order to estimate the relationship between the variables and the relationships direction. The time series X is a Granger cause of the times series of Y if X is useful in forecasting Y. In the case where both time series or variables are causing each other we speak of it as a feedback system. The Granger causality is built on the VAR model and F test is used to find the probable causality.

After running the cointegration test (Johansen test), if we explored that there is no cointegration between the variables, Hassapis (1999) in his paper implied that, the direction of causality can be decided by applying standard F-tests in the VAR model. We will use the Akaike Information Criteria (AIC) for estimating the optimal lag order in our model. Choosing the optimal lag order is crucial for ensuring the white noise process of error terms.

The prerequisite for causality test is to use stationary variables and the hypothesizes of the test are;

$H_0$ : Y does not Granger cause X ; $\alpha_1 = \alpha_2 = \ldots \alpha_k = 0$
$H_1$ : Y Granger cause X ; At least one $\alpha_k$ is different than zero

## 4. ESTIMATION RESULTS

### 4.1. Data properties

Table 4.1 presents the descriptive statistics of the data. The quarterly GDP growth for the period of 1992 (2) – 2006 (3) is averaged at % 1,56; while its standard deviation is %18,27; implying high volatility for that period. Average FDI inflows was 590 million dollars, and it reached top level in 2006 (2). The huge standard deviation; 1225 million dollars for FDI inflows is occurred because of the great performance that country experienced in the last years. The correlation coefficient between the GDP growth and FDI is -0,045, indicating a very low relationship in the negative direction. However, since the correlation coefficient can not give any information about the causality, we shouldn't decide that foreign direct investment inflows decrease the economic growth, or high economic growth rates prevents FDI inflows.

Table 4.1 Descriptive Statistics

| Variables | mean | Standard deviation | min | max |
|---|---|---|---|---|
| FDI inflows | $590m | $1225m | $55m | $7308m |
| GDP growth | 1.56% | 18,27% | -22,66% | 33,79% |

m: million

### 4.2 Unit root test

Before we perform the unit root test, both series; FDI and economic growth, were graphed in levels. I should note here that, the seasonality in the GDP data has not removed to be able to analyze long run relationship with Johansen cointegration test which requires same order of integration for both FDI and GDP growth.

As we can see from the graphs, FDI (figure 4.2.a) seems non-stationary. However, for the figure of GDP growth (4.2.b); the series look like as stationary one. We will decide its stationary properties after running the ADF test. The figures 4.2.c and 4.2.d indicate the first difference figure of both variables. These figures pointing out that the series are stationary in the first difference.
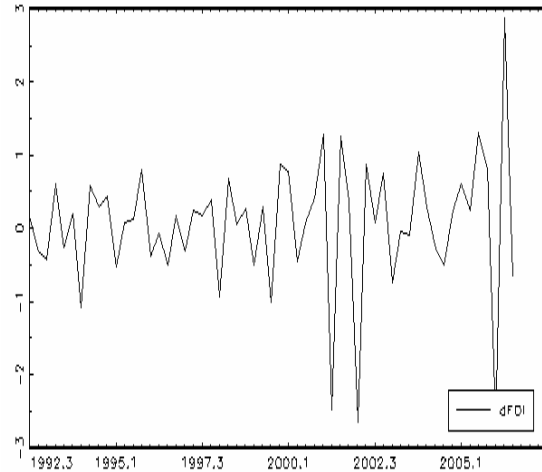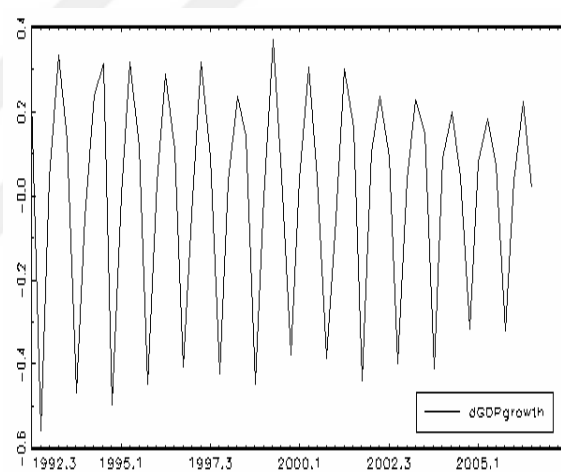
Graph 4.2.a : FDI inflows
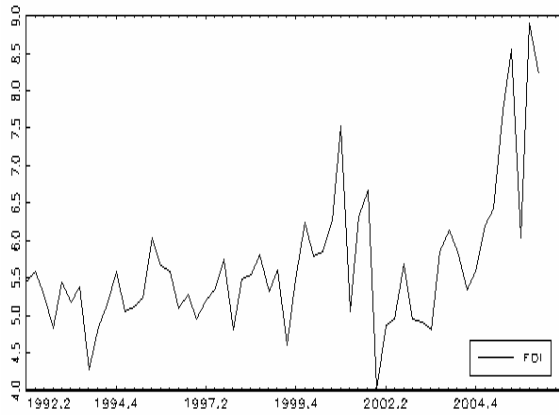


Graph 4.2.b : GDP growth
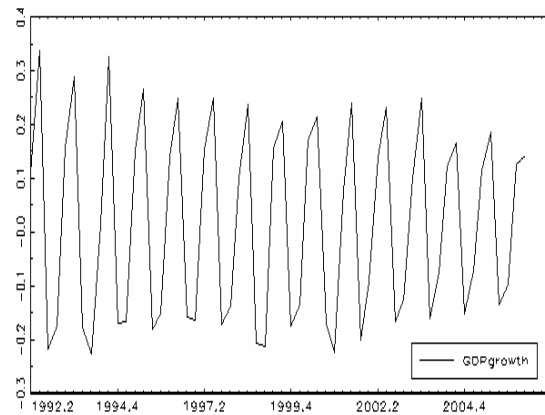


Graph 4.2.c : First difference of FDI



Graph 4.2.d : First difference of GDP growth



To conclude the order of integration of series, the ADF test applied to variables that are in the levels. The results presented in Table 4.2.a showed that the null hypothesis; existence of a unit root which means non-stationary series, can not be rejected for FDI and GDP growth. Although the graph for GDP growth in the level form (4.2.b) seems stationary as we mentioned before, due to ADF tests both variables; FDI and GDP growth are non-stationary in the levels.

Table 4.2.a : ADF unit root test results for levels

| Variables | ADF t-value | Critical value 5% |
|---|---|---|
| FDI | -1,54 | -3,41 |
| GDP growth | -2,34 | -2,86 |

Similarly the ADF test performed for the first differences of variables, the results in Table 4.2.b concludes that since we reject the null hypothesis of the presence of a unit root, both variables are stationary in the first difference i.e. I(1). This result allows us to test for cointegration, i.e. test for same random trend between the variables, so that we can make some comments about the long run relationship of FDI and economic growth of Turkey.

Table 4.2.b : ADF unit root test results for 1.st differences

| Variables | ADF t-value | Critical value 5% |
|---|---|---|
| dFDI | -8,63 | -2,86 |
| dGDP growth | -7,48 | -2,86 |

dFDI : first difference of FDI
dGDP: first difference of GDP growth

### 4.3 Cointegration test

To analyze the long run relationship between GDP growth and FDI, Johansen's cointegration test was performed in this section. Before performing the test, we can have a guess from the figure 4.2a and 4.2b in the previous page that, the series doesn't indicate a long run relationship because of their different shapes. To confirm this, we performed Johansen test and we used AIC information criteria to estimate the optimal lag; 8 lags offered by AIC which is the lowest information criteria as indicated in Table 4.3.a. To conclude the cointegration properties, Table 4.3.b points out that, since the test value does not fall in the rejection area, we can not reject the null hypothesis of "no cointegration between the variables", thus there is no long run relationship between FDI inflows and economic growth in Turkey.

Table 4.3.a: VAR Lag Order Selection Criteria

| Number of Lag | AIC |
|---|---|
| 3 | -6,1095 |
| 4 | -6,3992 |
| 5 | -6,2891 |
| 6 | -6,1708 |
| 7 | -6,1691 |
| **8** | **-6,7758** |
| 9 | -6,6613 |
| 10 | -6,5355 |

Table 4.3.b : Johansen trace test for cointegration

| Null Hypothesis | Trace Statistic | Critical value %5 | p-Value |
|---|---|---|---|
| $H_0$: r=0 | 11,18 | 25,73 | 0,86 |
| $H_1$: r=1 | 4,40 | 12,45 | 0,68 |

r is the number of cointegrating vectors under the null hypothesis

In fact we can not expect that, countries very low FDI inflows have a relationship in the long run with the instable economic growth. According to Ok (2004), if the capital level of a firm increases, so does the risk they are taking in a foreign country. Because of Turkey's high uncertainty atmosphere we discussed in chapter 2, the foreign investors which are already in the country did not continue their investments and also any other long term FDI couldn't attracted. Thus FDI could not make any long term contribution to countries economy by its positive effects such as increasing capital stock and productivity, transfers of technology and managerial skills, generating employment.

However, it is possible that FDI and GDP growth affect each other in the short run. We will try to investigate this by the conventional Granger causality test, performed in the following section.

## 4.4. Granger causality test

Although we couldn't find a long run relationship between the variables by performing cointegration test, there is still possibility that these variables are causally related in the short run. As we mentioned before the direction of causality can be decided by applying standard F-tests in the VAR model. If one estimates a model with non stationary variables, it can give rise to spurious correlation. Thus we used the stationary time series, which were the ones in the first difference form for both FDI and GDP growth.

When we construct our VAR model we used the AIC information criteria, which is offered 7 lags, for optimal lag order. We also excluded the intercept since it was insignificant. All other coefficients that are included in the model are significant. By looking at the residual analysis of the model, autocorrelation has not seen in the residuals.

After constructing our VAR model, we performed causality test. The results of the Granger causality test presented below in the Table 4.4, indicates that since p-Values are higher than 5 % significance level, we can not reject both null hypothesizes of "FDI do not cause GDP growth" and "GDP growth do not cause FDI". Thus we conclude that there is no causal relationship between GDP growth and FDI inflows in Turkey neither in the long run nor in the short run.

Table 4.4 : Granger causality test results

| Null Hypothesis | Test Statistic | p-Value |
|---|---|---|
| FDI doesn't cause GDP growth | 0,97 | 0,46 |
| GDP growth doesn't cause FDI | 1,86 | 0,09 |

We can explain the result of non-existing short run causal relationship by the hypothesis we discussed in chapter 1. Firstly, we may ask why "FDI led growth" hypothesis did not hold even for the short run, the answer can be given with the help of many surveys we mentioned in the introduction part; the effects of FDI to economic growth is country specific, depends on different factors such as technological conditions, human capital properties, well-developed financial markets. Thus, Turkey could not benefit from FDI in the short run because of one or some of those reasons. Secondly for the "growth – driven FDI" hypothesis we can assert that even the country had rapid growth rates in some years, because of the factors according to Ok (2004) and many surveyors, such as political instability and defaults by government's promises to foreign investors, led foreign investors to invest other countries.

## 4.5 Policy recommendations

As we mentioned in section 2.2, the countries weak economic performance until 2000's was mainly because of high inflation and interest rates, high deficits and the government's wrong economic policies to handle these problems. All these factors led Turkey to have economic instability especially during the last 20 years which negatively affected FDI inflows. Also political instability; frequently changing weak government coalitions, was a crucial obstacle to attract foreign investors. In fact, according to recent surveys such as OECD's Turkey 2004 report, Gorgun 2004, Loewenhadl 2001, and Ok 2004, economical and political instability was the main reason of low FDI inflows to Turkey, followed by ineffective taxation policies, administrative barriers, limits in the supply of trained workforce, insufficient R&D investments and technological development.

Thus, the first condition for Turkey to attract greater FDI is to ensure the political and economic stability. We can better understand the impact of ensured stability on FDI inflows when we look at Poland, which has similar economic structure with Turkey and also a major competitor country in attracting FDI. In Poland, FDI has been increasing steadily since the political and economic reforms started in 1989. More than USD 60 billion of foreign capital has been invested in Poland since then with the help of Polish government's successful privatization decision.

Loewendahl (2001), in the policy recommendation part of her survey called "Turkeys performance in attracting FDI"; gives much importance to progress in privatization, for attracting desired levels of inflows to Turkey. In fact, Poland's and other main competitor countries of Turkey for FDI; such as Czech Republic's and Hungary's high FDI inflows can be explained as an outcome of the privatizations realized in these countries during the 1990s. Also the EU membership process of Poland, Czech Republic and Poland, for sure had substantial positive effects to economic growth rates and FDI inflows. These 3 countries attracted the significant part of total FDI inflows in the region until recent years.

Turkey has become more attractive with macroeconomic programs started in 2001 to ensure the stability, a single-party government elected in 2002, the Law on Foreign Investments enforced in 2003 and lastly EU Council's decision at the end of 2004; to initiate membership talks with Turkey. The FDI inflows to the country, reached a record level, USD 9.65 billion, in 2005 and 17 billion in 2006. Unfortunately this investment inflow, mostly associated with privatizations and M&As which appears in the short term, does not signify that Turkey has become a point of attraction for FDI (A.T. Kearney and UNCTAD 2005). With the increased transparency and stability for foreign investors by EU membership talks, foreign investors' interest is expected to increase in the medium-term particularly in service sector. However as Yilmaz (2006) and Loewenhadl (2001) suggested in their papers, Turkey should attract long term FDI that creates directly and indirectly new production capacities, brings new finance, know how and technology and contributes to its human capital development. All these factors will lead country to have a better performance in economic growth and development. Therefore the government should also improve the investment environment with the ensured political and economical stability to maintain its FDI attractiveness and competitiveness in the long run.

In short, I suggest that Turkey's efforts to have sustainable economic development should also include attracting FDI as an essential factor. Significant preconditions for attracting FDI are to sustain economic stability and policy certainty and to meet the requirements to become a full membership to EU. The government should continue to realize privatization with new investment promotion activities and minimizing obstacles caused by excessive bureaucracy. Turkey also needs to support R&D, develop technological and human infrastructure for attracting and benefiting foreign investments in the medium and long term.

## 5. CONCLUSIONS

Many recent studies, analyzing the foreign direct investment and economic growth have found that there is a positive relationship between FDI and economic growth. But the direction of causality can not be identified without running the causality tests. In this paper we tried to investigate the causal relationship between economic growth and FDI in the country level, for Turkey, using the Johansen cointegration and Granger Causality tests for the period 1992 (Quarter 2) – 2006 (Quarter 3). Our test results suggest that, there is neither a long run not a short run effect from FDI to economic growth or economic growth to FDI. Thus, we could not find any pattern for each hypothesis of "FDI led growth" and "Growth driven FDI" in Turkey. The main reason of this result is that the country had unstable growth performances and very low FDI inflows for the period we analyzed. In fact according to many surveys, the countries failure to attract foreign investors is mainly because of the economic and political instability since 1970's.

However, the economic program started with IMF in 2001, the political stability ensured after 2002 elections and the EU Council's decision to start membership talks with Turkey at the end of 2004, had made positive effects to both economic growth and FDI inflows in the last 2 years. We believe that after a few years we will find a short run causality relationship between economic growth and FDI with these improvements in Turkey.

As many papers about Turkey's FDI and economic growth performance suggested, we also suggest that the country's efforts to have a sustainable economic development should also include attracting more FDI inflows, especially for the long term. In order to realize this, the government should improve the investment environment with the ensured political and economic stability in the country.

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