Macroeconomic Performance and Volatility of Turkish Republic of Northern Cyprus

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ABSTRACT

This thesis aims to comparatively analyze the macroeconomic performance and volatility of the Turkish Republic of Northern Cyprus (TRNC) over the period 1980–2010, which is further categorized into three sub-periods: 1980–1990, 1990–2000, and 2000–2010. I compute and compare the respective period averages and volatility measures of selected macroeconomic parameters, such as GDP growth; inflation, saving, investment, and unemployment rates; general government balance (% of GDP); export-to-import ratio; shares of exports and imports in GDP; trade openness (as measured by the ratio of the sum of exports and imports as a proportion of GDP); and current account balance (% of GDP). The averages are compared primarily to determine the factors that cause fluctuations and dramatic increases/decreases in the aforementioned parameters, as well as to identify the highest and lowest recorded values of the parameters. I also comparatively analyze the sectorial composition of TRNC's GDP. Computations of volatility focus on which period exhibits the highest and lowest volatility across the entire period studied

Keywords: Macroeconomic Performance, Volatility, Comparative Analysis

ÖZ

Bu tez Kuzey Kıbrıs Türk Cumhuriyetinin 1980 2010 yılları arasını kategorize edilmiş üç periyot halinde macroekonomik performansını ve volatilitesini analiz etmeyi amaçlamaktadır. Reel buyume hızı, enflasyon, tasarruflar, yatırımlar, işsizlik oranı, genel devlet dengesi, ithalat ve ihracat orani, ihracat ve ithalatin gayri safi yurtiçi hasılatı içerisindeki payı, dışa açıklık oranı (Bir ülkenin ihracat ve ithalat değerleri toplamının millî gelire oranı) gibi makroekonomik parametreleri periyodlar içindeki avarajlarını ve volatilitelerini hesaplayıp kıyasladım. Yukarıda bahsi geçen parametrelerin avarajları kaydedilen değerlerdeki ani iniş çıkışları tespit etmek, en yüksek ve en düşük değerleri ve dalgalanmaları gostermek icin hesaplanmıştı. Volatilite hesaplamalari ise periodlar içinde en düşük ve en yüksek değerleri göstermek icin yapılmıştır.

Anahtar Kelimeler: Makroekonomik performans, Volatilite, karşılaştırmalı analiz

Dedicated to my family with love…

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Chapter 1

INTRODUCTION

Understanding the economy of small islands with emerging economies has become a popular pursuit among economists. Such important islands include Malta, Singapore, and the Turkish Republic of Northern Cyprus (TRNC). TRNC is located in the northern region of the island of Cyprus in the Mediterranean Sea. Its economy, in particular, is characterized by a unique macroeconomic status and qualities because of the political division between the southern (Greek) and northern regions of Cyprus and because of the relationship of the latter with Turkey.

This research comparatively analyzes the macroeconomic performance and volatility of TRNC and the effects of selected parameters on the country's GDP growth rate. Macroeconomic performance indicates how effective a country is in realizing the key objectives of government policy. The objective of this thesis is to compute and compare the macroeconomic performance and volatility of selected macroeconomic indicators of TRNC over the period 1980–2010. There is no investigating about this subject. Therefore this thesis is expected to fill this gap. Result of this thesis useful for government authority and it gives insides for policy makers.

The rest of the thesis is organized as follows. Chapter 2 presents the literature review and a theoretical background on the macroeconomic performance of island economies, the determinants of economic growth and macroeconomic performance,

and the determinants of macroeconomic volatility, with emphasis on developing nations. The economic history of TRNC is also discussed.

Chapter 3 provides the data and methods used in this research, which is grounded on time series data collected from the database of Northern Cyprus's State Planning Organization. The selected variables are used to analyze TRNC's economy. Specifically, macroeconomic performance and volatility analysis and regression analysis are conducted on the basis of an error correction model.

Chapter 4 is devoted to the comparative analysis of the macroeconomic performance of TRNC in three sub-periods: 1980–1990, 1990–2000, and 2000–2010. Data on these sub-periods are illustrated with line graphs and tables on simple averages. The tables also contain a summary of the average results for the entire study period and the sub-periods.

In Chapter 5, the macroeconomic stability of TRNC over the three sub-periods is compared. Macroeconomic stability is analyzed in terms of the volatility of the selected parameters, which are listed in tables that summarize the standard deviation results for the entire study period and the sub-periods.

Chapter 6 discusses the regression analysis based on the error correction model and presents a detailed examination of the model's results. Chapter 7 concludes the thesis with a summary of major findings.

Chapter 2

LITERATURE REVIEW

This chapter discusses earlier research related to the field of study to provide information on previously published findings and deductions on the macroeconomics of small islands.

As previously stated, I analyze the macroeconomic volatility of TRNC. Macroeconomic volatility is both a source and a reflection of underdevelopment—a fundamental concern, especially for developing countries. The relationship between macroeconomic volatility and growth is a long-standing and essential issue in economic research. Limbs (2002) stated that such relationship can flow in positive and negative ways. It is sensitive to large external shocks, microeconomic rigidities, volatile macroeconomic policies, and institutional weaknesses. Volatility pertains to the direct welfare costs borne by risk-averse individuals and to the adverse effects of such costs on income growth and development (Loazyza, Ranciere, Serven, & Ventura, 2007).

Cyprus does not exhibit the characteristics that are generally attributed to other small islands. The macroeconomic performance of TRNC indicates that it is characterized by the economy of a developing country and an island economy that is influenced by the political circumstances that have arisen from its relationship with Turkey. In addition to political difficulties, other economic problems specific to small islands

are experienced by TRNC. For example, it has limited natural resources and a very small domestic market. Because of its almost complete integration into the Turkish economy, TRNC is equally exposed to all the real and monetary shocks and instabilities prevailing in the former's economy (Guncavdi & Kucukcifci, 2008).

Bass and Dalal-Clayton (1995) pointed out that small islands have development limitations that are specific to such regions generally because of the special characteristics of their economies, natural resources, and social and cultural environments. Wright (2000) noted that economic growth increases economic prosperity where living standards improve; under such a situation, people live their lives with happiness and satisfaction. Without economic growth, nations will fail to guarantee the wellbeing of their citizens. Moreover, Levine and Renelt (1992) demonstrated that economic growth is the result of a sound perspective on macroeconomic policy and high investments in terms of physical and human capital.

Kharroubi (2007) used the shortcomings of the financial systems of developing countries as bases in explaining the negative relationship between growth and volatility in such nations. Moral hazards generate bias toward short-term debt contracts, thereby increasing the risk of liquidity crises and macroeconomic volatility.

The relationship between growth and inflation remains controversial. Some findings indicate that macroeconomic stability is associated with low inflation, which positively affects growth. Low inflation is therefore the preferred factor of many industrialized and developing countries in sustaining high economic growth. High

and variable inflation can create certain costs when it delays the efficiency of an economy. Because of inflation and increased price variability, the future profitability of investment projects can be indeterminate, which in turn, can reduce investment and economic growth to a low level (Gokal & Hanif, 2004).

Paul, Kearney, and Chowdhury (1997) carried out research to determine whether causality occurs between inflation and real GDP growth in the long term. They used 70 countries as a sample, including industrialized and developing countries that exhibited high and low inflation economies over a 30-year period. According to the researchers, the growth and inflation in around one-third of the sampled countries do not exhibit a relationship. The authors concluded that a single pattern cannot be used to examine the relationship between growth and inflation in these nations.

Friedman (1977) indicated that a rise in the average inflation rate leads to more uncertainty about upcoming inflation rates. It misrepresents the effectiveness of the price mechanism in efficiently allocating resources, thus creating economic inefficiency and decreasing the growth rate of output. Inflation uncertainty also affects resource allocation. For these reasons, a comprehensive empirical study that verifies the actual effects of inflation should control for the influence of inflation uncertainty on output. The positive correlation between inflation uncertainty and inflation reported in empirical studies can also stem from a positive causal effect of inflation uncertainty on inflation.

Using 1997–2006 data, Erbaykal and Okuyan (2008) studied the relationship among inflation and economic growth in Turkey's economy. The authors validated the

long-term relationship between periods by the ARDL boundary test developed by Pesaran et al. (2001), although the method of determining a causality relationship by the causality approach was developed by Yamamoto (1995). The analyses results show a relationship between causality and cointegration in Turkey. The authors concluded that causality from inflation extends to economic growth.

Sachs and Larraine (1993) stated that increasing saving rate is one of the most popular recommendations for improving economic growth. However, the answer to the question "does a higher saving rate lead to faster economic growth" can be both yes and no. According to Solow's (1956) neoclassical model, saving rate exerts no effect on the steady-state rate of growth. Economy grows at a constant proportional rate in the long run, regardless of the value of saving rate. Nevertheless, this rate can affect per capita income level in the long term and growth rate in the short term. As indicated in Solow's model, therefore, an increase in national saving results in a temporary rise in growth rate but does not affect steady-state growth rate. For this rate to be influenced, steady-state growth must be equal to the rate at which labor force grows. Prinslou (2000) pointed out that high savings is important for the rapid growth of capital stock, with such growth leading to economic growth through economic investments.

Ekinci and Gul (2007) studied the relationship of domestic saving and economic growth in Turkey by using 1960–2004 data. The results indicate a long-term relationship between saving rate and economic growth. By contrast, the results of causality analysis show that one-directional causality runs from economic growth to domestic saving rates.

According to Lucas (1988), human capital exhibits high validity in Solow's (1956) model and adds an extra variable into the model. He argues that the general skill of labor cannot be generalized to all countries; that is, human capital is not necessarily identical across all countries. Technology, for example, is a type of human knowledge that is specific to particular groups of people. The author suggests that differences between countries remain because the production of different goods requires different skills.

A number of growth theories have been proposed because of the importance of economic growth in society. Despite this series of theoretical contributions, however, economists have reached no consensus regarding the effectiveness of such theories. In his book, *Wealth of Nations*, Smith (1779) identified three major sources of economic growth: growth in capital stock and labor force, improvement in the efficiency with which capital is used in labor through greater division of labor, and technological progress and promotion of foreign trade that expands a market and reinforces the other two sources of growth. Smith contends that growth is a result of an increase in one of these three variables.

Through a comparison with Turkey, Ciftcioglu (2005) determined that high growth is related to a high level of financial savings and investments. The author revealed that a higher saving rate increases the available amount of financial capital for investment, which may be used to increase the rate of capital accumulation; increased financial capital also positively affects growth.

International tourism is a main source of foreign revenue for both small and large countries, yet no study has provided conclusive results as to the empirical relationship between international tourism and economic growth (Gunduz & Hatemi-J, 2005). The international tourism and higher education sectors are two major sources of foreign exchange for TRNC because its foreign trade is restricted by embargoes. However, the country's tourism sector is confronted with serious challenges in attracting international tourists because of the embargoes. In TRNC, international tourism, higher education, and economic growth are characterized by a long-term relationship (Katircioglu, Fethi, & Kilinc, 2005)

According to Nadiri (1998), "Tourism is one of the most challenging and fastest growing sectors in the world. The tourism industry provides various benefits and satisfaction for people related with economic, social and environmental concerns." Tourism is therefore critical to economic growth, particularly in developing countries.

Giovanni and Levhenko (2006) indicated that countries more open to trade tend to be more volatile. The authors claim that this phenomenon is caused by counteracting forces. Two mechanisms lead to a positive relationship: traded sectors are more volatile than nontraded sectors, and trade causes specialization in fewer sectors. Nonetheless, traded sectors are less connected to the rest of the economy and can thus serve as an avenue for hedging activities.

Considerable research has been devoted to the relationship between trade openness and economic growth, but scholars have not reached a consensus regarding this

issue. Yanikkaya (2003) determined that trade liberalization is indirectly related to growth. In developing countries, trade barriers are positively and significantly associated with growth. By contrast, Alexander and Ellin (2009) found that trade openness exerts positive effects on economic growth. Liargovas and Konstantinos (2012) analyzed the importance of trade openness in economic growth and found that in the long run, trade openness positively contributes to the inflow of foreign direct investment.

The view of exports as one of the main determinants of economic growth can be traced to the classical economic theories of Adam Smith (1776) and David Ricardo (1817) (as cited in Abou-Stait, 2005). Ricardo (1817) noted that trade facilitates product output, thereby affording a country comparative advantage and resulting in greater national wealth. Increased exports therefore improve economic growth. Studies have demonstrated the long- and short-term relationships between export and economic growth; these investigations also indicated a unidirectional causal relationship between foreign direct investment and economic growth (Dritsakis, Varelas, & Adamopoulos, 2006).

Al-Habees and Rumman (2012) examined the relationship between growth and unemployment and found a significant correlation between growth and changes in unemployment rate. High rates of growth specify the market need for additional labor to be recruited from the surplus of a labor force. Conversely, economic recession increases the unemployment rate because of job losses.

Chapter 3

DATA AND METHODOLOGY

This study is based on a time series analysis of the economy of TRNC. The data used in this thesis were derived from the databases of Turkish Republic of Northern Cyprus's State Planning Organization and the World Bank. Specifically, I used monthly data from January 1980 to December 2010.

3.1 Data

To analyze macroeconomic indicators, I looked into the macroeconomic performance and stability of TRNC in the three sub-periods. I calculated the respective averages of each parameter and used the standard deviations of the selected indicators to measure their respective volatilities.

The selected variables used in the analysis of macroeconomic performance are GDP growth rate; investment rate measured as gross capital investment (as a percentage of GDP); saving rate measured as domestic savings (as a percentage of GDP); inflation rate; export-to-GDP and import-to-GDP ratios; and trade openness ratio measured as the sum of respective ratios of exports and imports to GDP. In addition to these variables, tourist arrival and total number of students were also incorporated into the analysis. Total number of students is analyzed in three different categories: Turkish Cypriot students, students from Turkey, and students from other countries. For short term analysis, I categorized the entire study period into three sub-periods, namely, 1980–1990, 1990–2000, and 2000–2010. I subsequently carried out a comparative

analysis of the macroeconomic performance and stability of TRNC's economy over the three sub-periods.

Table 1 lists all the economic indicators that were obtained from the State Planning Organization. The left column shows the indicators and the terms used in the research, and the right column indicates the data terms used in the State Planning Organization database.

Table 1. Data and Its Abbreviation

Paper Term	Data Term
1. Growth Rate	Average growth rate of GDP % annually
2. Saving Rate	Gross saving rate % annually
3. Inflation Rate	Inflation (annual %)
4. Investment Rate	Investment (% of GDP)
5. Exports	Export of goods and services (Current $)
6. Imports	Import of goods and services (Current $)
7. Current account balance	Current account balance (% of GDP)
8. Export/Imports	5 over 6
9. Manufacturing	Manufacturing, value added (% of GDP)
10. Agriculture	Agriculture, value added (% of GDP)
11. Traded Goods	9 plus 10
12. GDP	GDP (Current $)

Chapter 4

GRAPHICAL ANALYSIS OF THE HISTORICAL BEHAVIOR OF THE SELECTED MACROECONOMIC PARAMETERS

This chapter presents the analysis of TRNC's macroeconomic performance, with consideration for the key macroeconomic parameters for the three sub-periods. These parameters, which are illustrated in tables and graphs, are as follows: GDP growth rate; inflation, saving, investment, and unemployment rates; general government balance (% of GDP); export-to-import ratio; shares of exports and imports in GDP; trade openness (as measured by the ratio of the sum of exports and imports as a proportion of GDP); and current account balance (% of GDP). I discuss all these parameters in the succeeding sections by using historical averages.

Table 2. Macroeconomic Performance of Turkish Republic of Northern Cyprus and South Cyprus

	Turkish Republic of Northern Cyprus				**South Cyprus**
Parameter	**1980-1989**	**1990-1999**	**2000-2010**	**1980-2010**	**1980-2010**
Growth Rate	4.7%	3.3%	4.6%	4.2%	4.5%
Inflation	52.2%	81.9%	21.2%	51.8%	4.8%
Saving Rate	9.5%	12.9%	14.9%	12.4%	18.8%
Investment rate	18.4%	17.0%	19.3%	18.2%	24.2%
Unemployment	2.23%	1.04%	7.00%	3.42%	4.7%
General Government Balance (% of gdp)	-7.81%	-8.03%	-11.58%	-9.14%	-5.46%
Exports / Imports	30.81%	16.47%	8.12%	18.47%	90.6%
Exports (% of gdp)	17.67%	8.55%	3.21%	9.81%	48.9%
Trade Openness	76.73%	60.67%	44.75%	60.72%	103.3%
Current Account Balance (% of gdp)	-7.81%	-8.03%	-11.84%	-9.23%	-9.5%

The historical averages of most of the key parameters in Table 1 show that improvements in TRNC's macroeconomic performance were unstable over the studied period. By contrast, the performance of certain parameters could be clearly determined.

The growth rate of a country determines the country's wealth, standard of living or quality of life. Adam Smith (1776) stated that the major sources of growth are growth in labor force and capital stock, improvements in labor and technological development, and promotion of foreign trade. Therefore, growth rate is one of the most important parameters in analyzing the macroeconomic performance of a country. Accordingly, countries expect a steady increase in average growth rate, but as shown in Table 2, the growth rate of TRNC in the first sub-period (1980–1990) is almost the same as that in the third sub-period (2000–2010). Inflation rate can be an important measure and determinant of macroeconomic and financial stability. In the last sub-period, TRNC's inflation rate decreased to 21.2% from 81.9%, the highest average inflation rate from 1990 to 2000. These results indicate an improvement in the average inflation rate of TRNC. The unemployment rate in the country increased to 7.00% from 2000 to 2010 compared to 1.04% in 1990 to 2000.

Researchers agree that trade liberalization plays an important role in growth. According to Harvard economics Professor Gregory Mankiw (2006), "[f]ew propositions command as much consensus among professional economists as that open world trade increases economic growth and raises living standards." Trade openness—the share of export and imports in GDP—reflects trade liberalization. TRNC's average trade openness steadily diminished. Table 1 presents the individual

shares of exports and imports in the country. As shown in the table, exports in TRNC accounted for a very limited proportion of the GDP.

The diminishing rate of output in TRNC may be attributed to the lack of discipline in implementing fiscal policy and the increased rate of monetary instability in the country. Consequently, the general government balance (% of GDP) increased to –11.58% and –7.81% from 2000 to 2010 and from 1980 and 1990, respectively. The average inflation increased from 52.2% to 81.9%.

The investment rate in the studied region improved in the last sub-period. The positive response of the investment rate may be due to macroeconomic stability or the increased availability of cheap credit in the TRNC market. As indicated in Table 2, the saving rate dramatically increased from 9.5% to 14.9%; accordingly, the consumption level decreased.

4.1 Comparing South Cyprus and Turkish Republic of Northern Cyprus

The growth rates of the two countries in 1980– 2010 were close to each other: the growth rate of TRNC was 4.2%, whereas that of Southern Cyprus was 4.5%. The inflation rate of the former was 51.8%, whereas that of the latter was 4.8%. Research shows that inflation rate affects the growth rates of countries. In the case of TRNC and Southern Cyprus, however, although a huge gap exists between their inflation rates, their growth rates are almost the same. From 1980 to 2010, the saving rates of TRNC and Southern Cyprus were 12.4% and 18.8%, respectively.

Meanwhile, TRNC's investment rate was 18.2%, and Southern Cyprus' inflation rate was 4.51%—an unexpected result given that investment is a high-risk activity and expectations about the future of a country influence investment. From 1980 to 2010, Southern Cyprus acquired membership in the European Union, however it did not enabling the country to achieve an investment rate higher than that of TRNC.

The unemployment rates of the two countries across the studied period were also close. The unemployment rate of TRNC was 3.42%, whereas that of Southern Cyprus was 4.7%. The difference in general government balance is also noticeable, with TRNC having a balance of –9.14%, a value higher than Southern Cyprus' –5.46%.

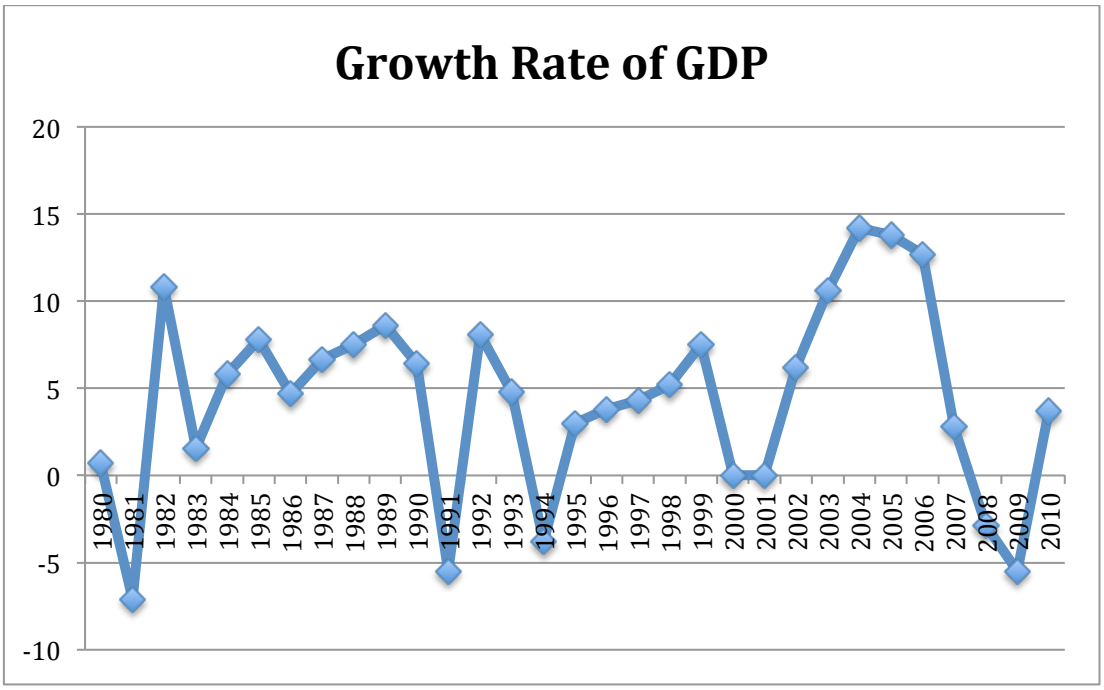
In terms of three trade-related parameters, Southern Cyprus far exceeded TRNC. These parameters are export-to-import ratio, export as a share of GDP, and trade openness. The export-to-import ratio of TRNC was 18.47%, whereas that of Southern Cyprus was 90.6%. The export rate (as a share of GDP) of TRNC was 9.81%, whereas that of Southern Cyprus was 48.9%. The trade openness of TRNC was 60.7%, whereas that of Southern Cyprus was 103.4%. These huge differences in trade parameters are expected given the embargos imposed on TRNC. Finally, the current account balances (as a share of GDP) in TRNC and Southern Cyprus were –9.23% and –9.5%, respectively.

Trade openness positively influences growth rate. On the basis of the huge difference in trade openness between the two countries, their growth rates should also be highly dissimilar. As previously stated, however, the growth rates of the

countries are almost identical. Given that investment rate is another key parameter that affects growth rate, the indistinguishable growth rates may be attributed to the lower investment rate of TRNC.

The succeeding sections provide a detailed analysis of each parameter via the examination of graphs and tables for the entire study period and the three sub-periods.

4.2 Analysis of the behavior of growth rate of GDP



Graph 1. Growth rate of GDP fover 1980-2010

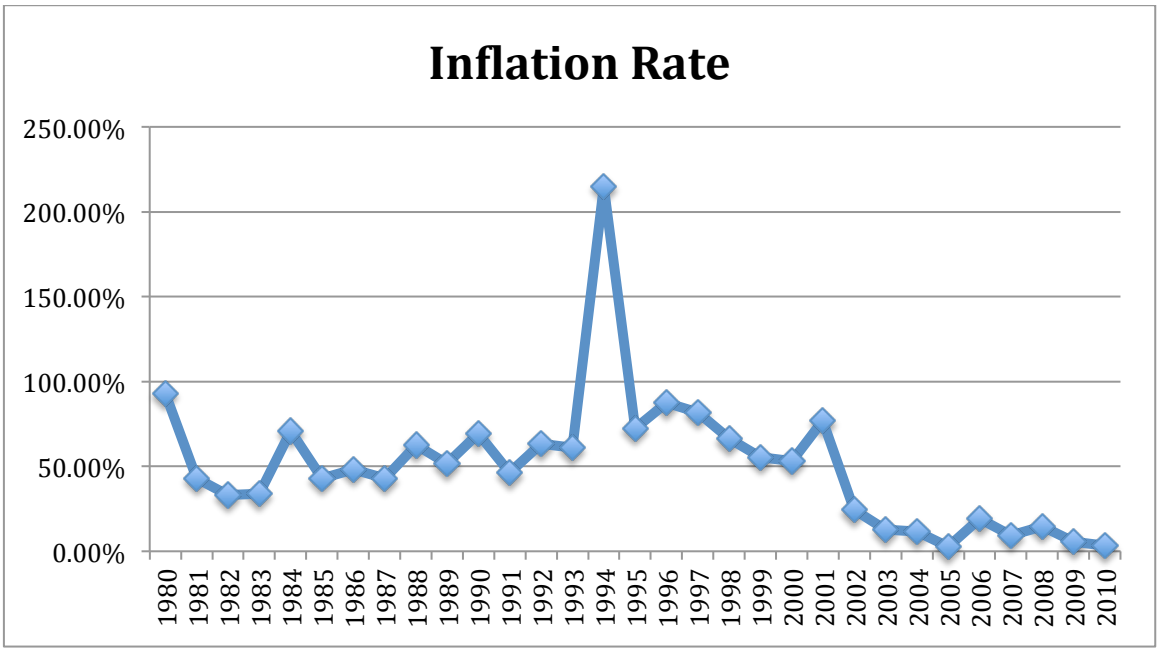
Table 3. Averages of growth rate of GDP

INDICATOR NAME	YEAR	TRNC
GDP GROWTH (ANNUAL %)	1980-1989	4.72
GDP GROWTH (ANNUAL %)	1990-1999	3.34
GDP GROWTH (ANNUAL %)	2000-2010	4.58
AVERAGE	1980-2010	4.21

The graph above illustrates the GDP growth rate of TRNC from 1980 to 2010 and indicates that the general growth rate fluctuated. The lowest recorded growth rate is –7.1%, which occurred in 1981, whereas the highest is 14%, which was achieved in 2004. These findings can be attributed to the construction investments that were initiated by the Annan Plan. Foreign investors began purchasing real estate from TRNC because of positive expectations from the aforementioned initiative. After a referendum, however, no permanent settlement was agreed upon. As expected, therefore, investments sharply decreased, followed by a reduction in the growth rate from 2005 to 2009.

Table 3 shows the average GDP growth rates in the sub-periods. In 1980–1990, TRNC experienced the highest average GDP growth rate at 4.72%. In 1990–2000, the rate reached its lowest at 3.34%. In 2000–2010, the average GDP growth rate increased again, reaching 4.58%. As can be seen, no difference in the average level of GDP occurred between the first and last sub-periods. Growth rate is the most important parameter for macroeconomic performance, indicating that steady improvements to standard of living should be a goal of any country.

4.3 Analysis of the behavior of Inflation Rate



Graph 2. Inflation rate in Turkish Republic of Northern Cyprus from 1980-2010

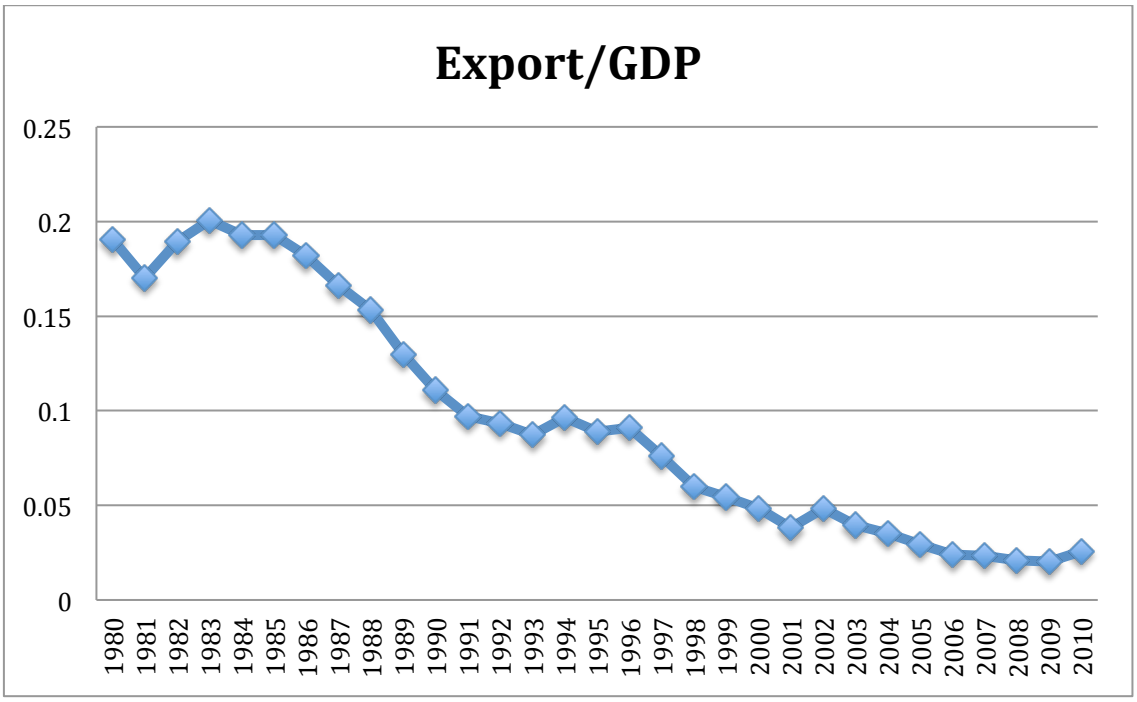
Table 4. Averages of inflation rate

INDICATOR NAME	YEAR	TRNC
INFLATION, GDP DEFLATOR (ANNUAL %)	1980-1989	52.20
INFLATION, GDP DEFLATOR (ANNUAL %)	1990-1999	81.85
INFLATION, GDP DEFLATOR (ANNUAL %)	2000-2010	21.22
AVERAGE	1980-2010	51.76

The figure above shows the inflation rates of TRNC over the studied periods. In the beginning of 1980, the inflation rate was 93%, but over 1980–1993, this rate remained relatively stable. The following year (1994), however, the inflation rate increased by 154%. Therefore, the highest inflation rate registered by TRNC in 1994 was 215%. After 1995, the rate gradually declined, reaching its lowest level in 2005 (2.7%).

Table 4 lists the average inflation rates of TRNC in the three sub-periods and in 1980–2010. The average inflation rates during the periods were unstable. The highest average inflation rate (81.85%) was achieved in 1990–2000, and the lowest (21.22%) was reached in 2000–2010.

4.4 Analysis of the behavior of the ratio of Export to GDP



Graph 3. Ratio of export to GDP in Turkish Republic of Northern Cyprus over 1980-2010

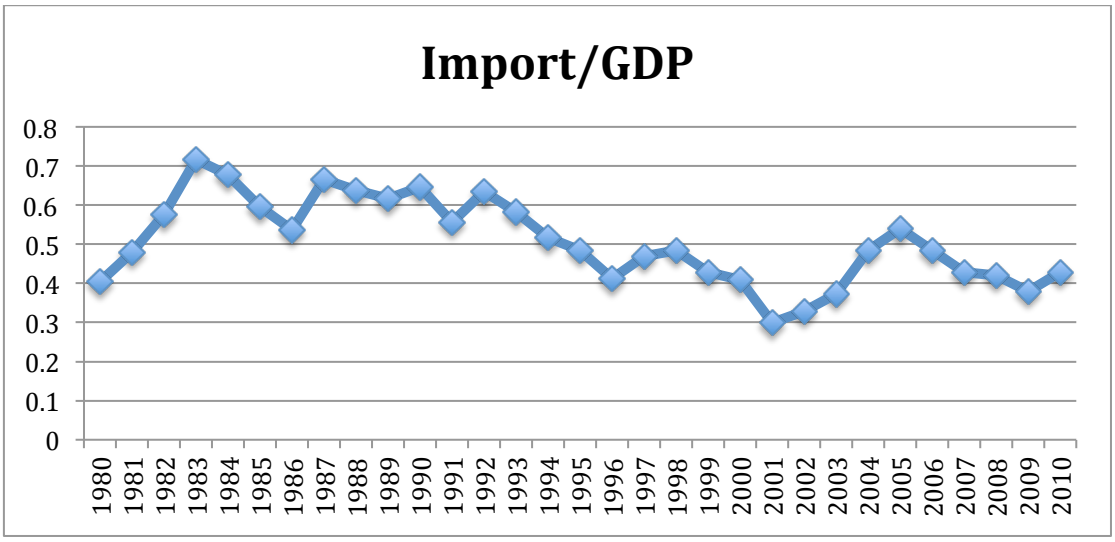
Table 5. Average of ratio of export to GDP

INDICATOR NAME	YEAR	TRNC
EXPORT/GDP	1980-1989	17.67%
EXPORT/GDP	1990-1999	8.55%
EXPORT/GDP	2000-2010	3.21%
AVERAGE	1980-2010	9.81%

As shown in Graph 3 and Table 5, the export-to-GDP ratio of TRNC fell steadily over 30 years. The highest ratio (20%) was achieved in 1983, and the lowest (2%) was experienced in 2009. The country reached the highest average export-to-GDP ratio of 17.67% in 1980–1990. During succeeding periods, this ratio steadily decreased. The average export-to-GDP ratio in the second sub-period (1990–2000) was 8.55%, whereas that in the third sub-period (2000–2010) was 3.21%.

Export always plays an important role in a country's economy. The outcomes of export rates are reflected in employment levels, economic growth rates, and current account deficits. An essential requirement, therefore, is for countries to maintain high export-to-GDP ratios.

4.5 Analysis of the behavior the ratio of imports to GDP



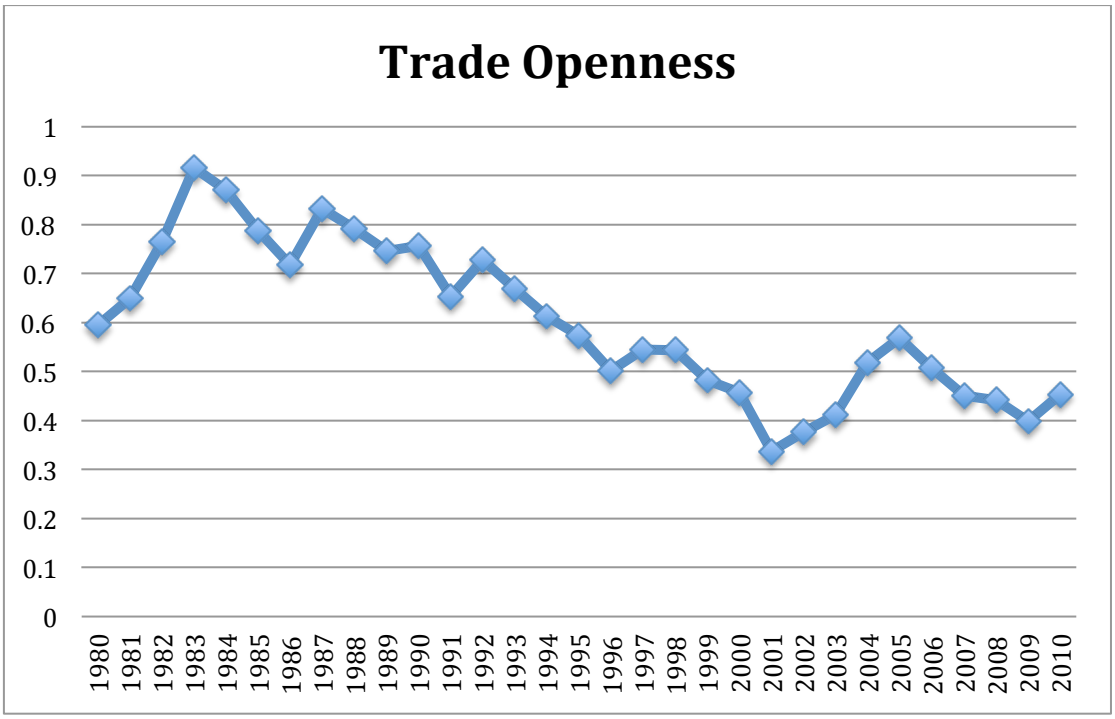
Graph 4 Ratio of import to GDP in Turkish Republic of Northern Cyprus over 1980-2010.

Table 6. Average of ratio of import to GDP

INDICATOR NAME	YEAR	TRNC
IMPORT/GDP	1980-1989	8.05%
IMPORT/GDP	1990-1999	17.99%
IMPORT/GDP	2000-2010	50.38%
AVERAGE	1980-2010	26.28%

Graph 4 shows that in general, the import-to-GDP ratio of TRNC changed with numerous fluctuations over 1980–2010. In the beginning of 1980, this ratio increased over the course of three years. In 1983, it reached its highest level at 71.6%. From 1987 to 2001, the ratio considerably declined with fluctuations. The lowest import-to-GDP ratio was 29.9%, occurring in 2001.

4.6 Analysis of Trade openness of Turkish Republic of Northern Cyprus



Graph 5: Trade openness ratio of Turkish Republic of Northern Cyprus over 1980-2010.

*Trade openness is measured as the sum of the respective ratios of exports and imports in GDP

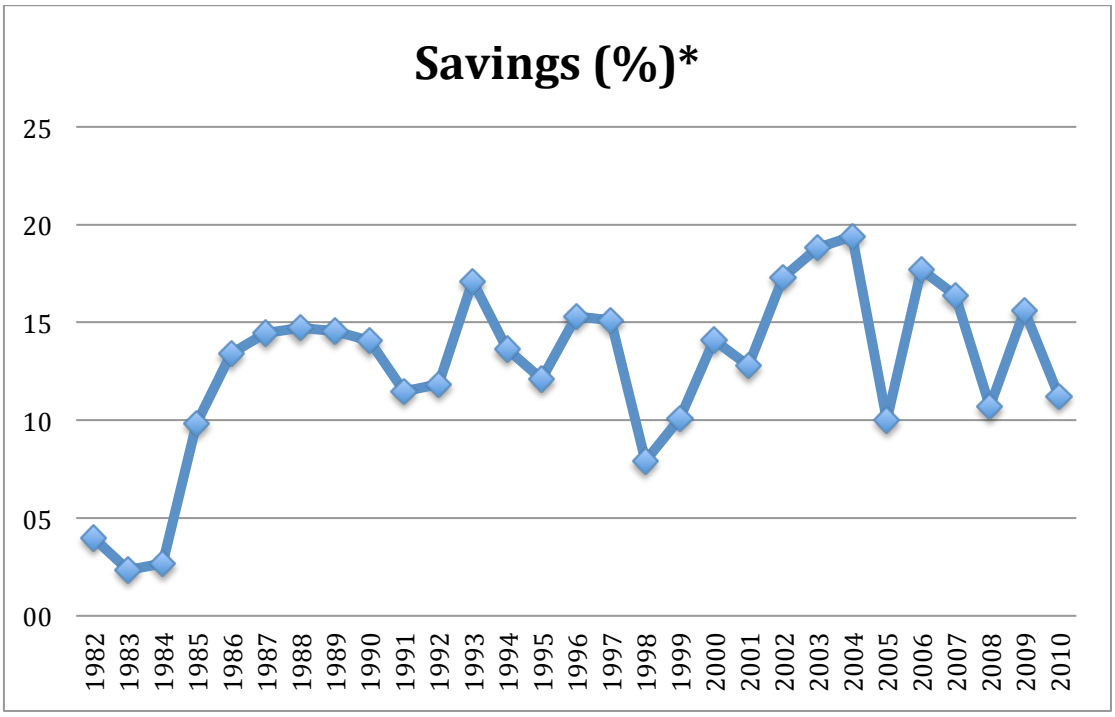
Table 7. Average of trade openness

INDICATOR NAME	YEAR	TRNC
TRADE OPENNESS	1980-1989	76.73
TRADE OPENNESS	1990-1999	60.67
TRADE OPENNESS	2000-2010	44.75
AVERAGE	1980-2010	60.72

The figure in the previous page indicates that trade openness, which is reflected by export and import goods and services related to GDP, fluctuated from 1980 to 2010. The degree of trade openness increased from 1980 to 1983. In 1983, it reached its highest recorded level at 91.6%. From 1983 to 2001, trade openness in TRNC declined. The lowest rate recorded is 33.7%, occurring in 2001.

The average degree of trade openness steadily diminished (Table 7). In 1980–1990, TRNC experienced its highest average trade openness at 76.73%, whereas in 2000–2010, the country had the lowest average trade openness at 44.75%. The average for the entire study period (1980–2010) was 60.72%.

4.7 Analysis of the behavior of savings rate



Graph 6 Saving rate of TRNC over 1982-2010

*Saving rate is measured on the gross saving as % of GDP

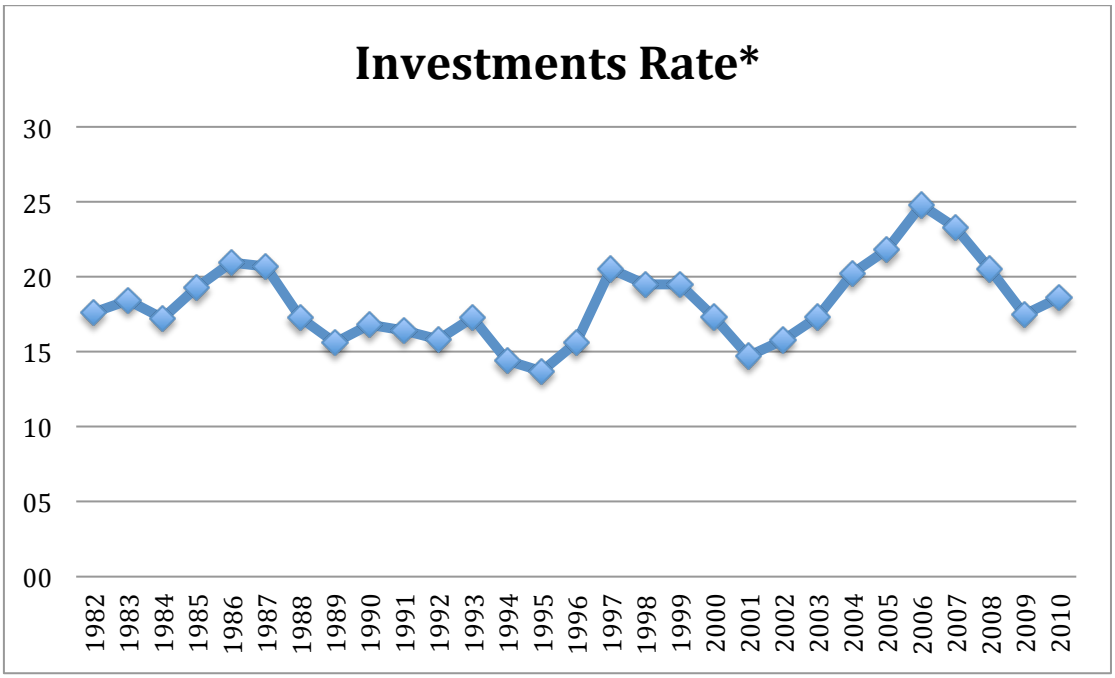
Table 8. Averages of saving rate of GDP

INDICATOR NAME	YEAR	TRNC
GROSS SAVINGS (% OF GDP)	1980-1989	9.50%
GROSS SAVINGS (% OF GDP)	1990-1999	12.86%
GROSS SAVINGS (% OF GDP)	2000-2010	14.91%
AVERAGE	1980-2010	12.42%

The saving rate of TRNC was unstable and inconsistent across the studied periods (Graph 6). The lowest saving rate (2%) occurred in 1983, and the highest (19%) was reached in 2004. The period at which TRNC exhibited a reliable incline or decline in this rate was only after 1986–1990; specifically, the country experienced an increase in saving rate in 1986–1988 and a decrease in 1988–1990.

The averages of the saving rates are shown in Table 8, which indicates a steady increase. TRNC experienced the lowest average saving rate (9.50%) in the first sub-period and the highest saving rate (14.91%) in the third sub-period.

4.8 Analysis of the behavior of investment rate over 1982-2010



Graph 7. Historical behavior of investment rate

*Investment rate is given by the percentage of gross investment in GDP

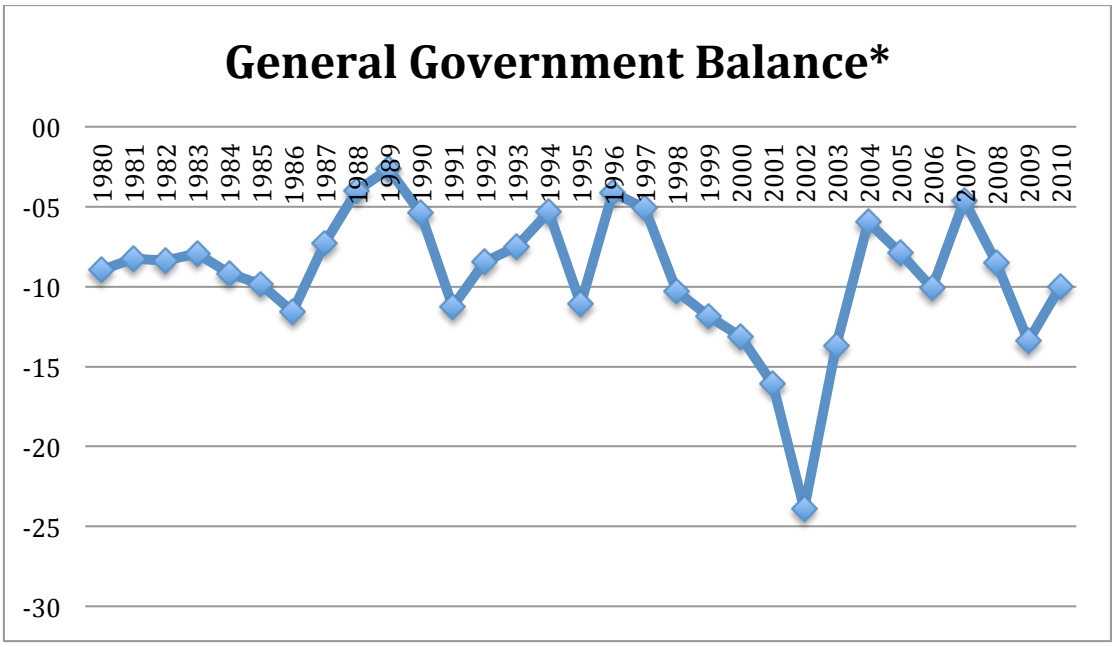
Table 9. Averages of investment rate as a percentage of GDP

INDICATOR NAME	YEAR	TRNC
INVESTMENT RATE	1980-1989	18.38%
INVESTMENT RATE	1990-1999	16.95%
INVESTMENT RATE	2000-2010	19.25%
AVERAGE	1980-2010	18.20%

The graph above shows that TRNC's investment rate was unstable. The lowest, 14%, occurred in 1995. The investment rate started to rapidly rise beginning from 2001 extending through 2006, during which the country experienced the highest investment rate (25%) in its history.

Table 9 lists the average investment rates in the three sub-periods. In the first sub-period, the investment rate was 18.38%. The second sub-period saw the lowest investment rate (16.95%) in the country, whereas the third sub-period exhibited the highest investment rate (19.25%). The average investment rate across the three sub-periods (i.e., from 1980 to 2010) was 18.20%.

4.9 Analysis of budget balance of Turkish Republic of Northern Cyprus



Graph 8. General Government Balance in Turkish Republic of Northern Cyprus from 1980-2010

*General Government Balance is measured as a percentage of GDP

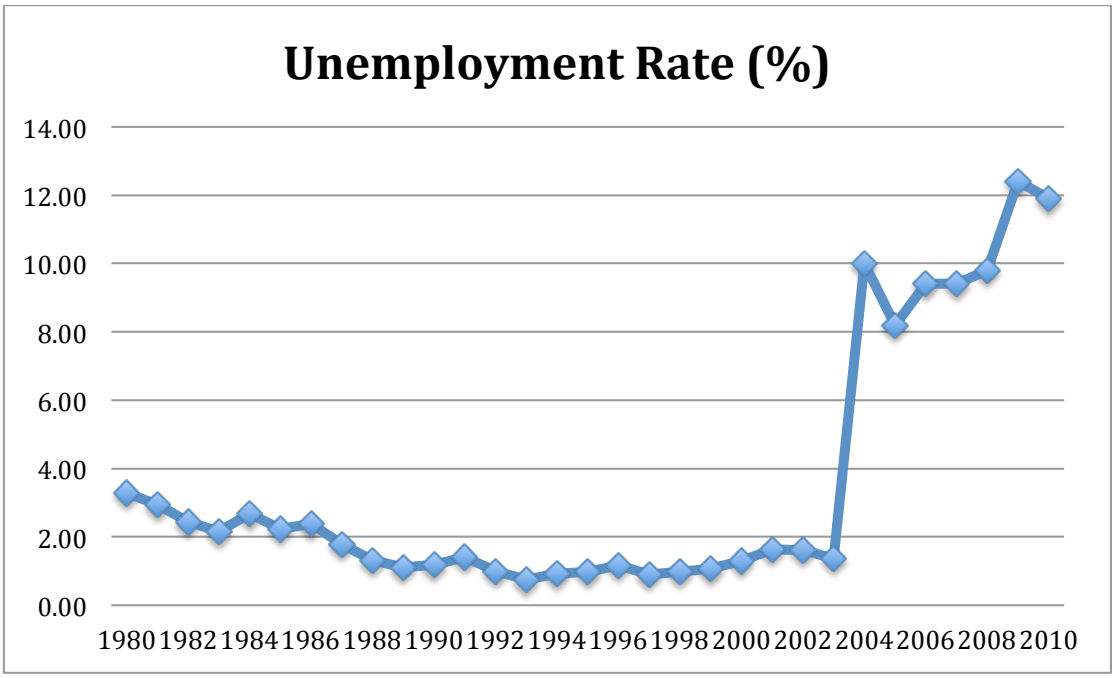
Table 10. Average of General government balance

INDICATOR NAME	YEAR	TRNC
GENERAL GOVERNMENT BALANCE	1980-1989	-7.81%
GENERAL GOVERNMENT BALANCE	1990-1999	-8.03%
GENERAL GOVERNMENT BALANCE	2000-2010	-11.84%
AVERAGE	1980-2010	-9.23%

The figure above indicates that every dataset shows values below zero. The lowest budget balance ever experienced by TRNC was –24%, occurring in 2001. After this year, the balance dramatically increased over the course of two years. The highest budget balance ever recorded is –2.7%, achieved in 1989.

Table 10 presents the averages of TRNC's budget balance in the sub-periods. In the first sub-period, TRNC experienced its lowest budget deficit at –7.81%. In the succeeding sub-period, the budget balance was –8.03%, and in the third, the country realized its highest budget deficit at –11.84%. The average over the three sub-periods was –9.23%.

4.10 Analysis of the behavior of unemployment rate over 1980-2010



Graph 9. Unemployment rate in Turkish Republic of Northern Cyprus from 1980-2010

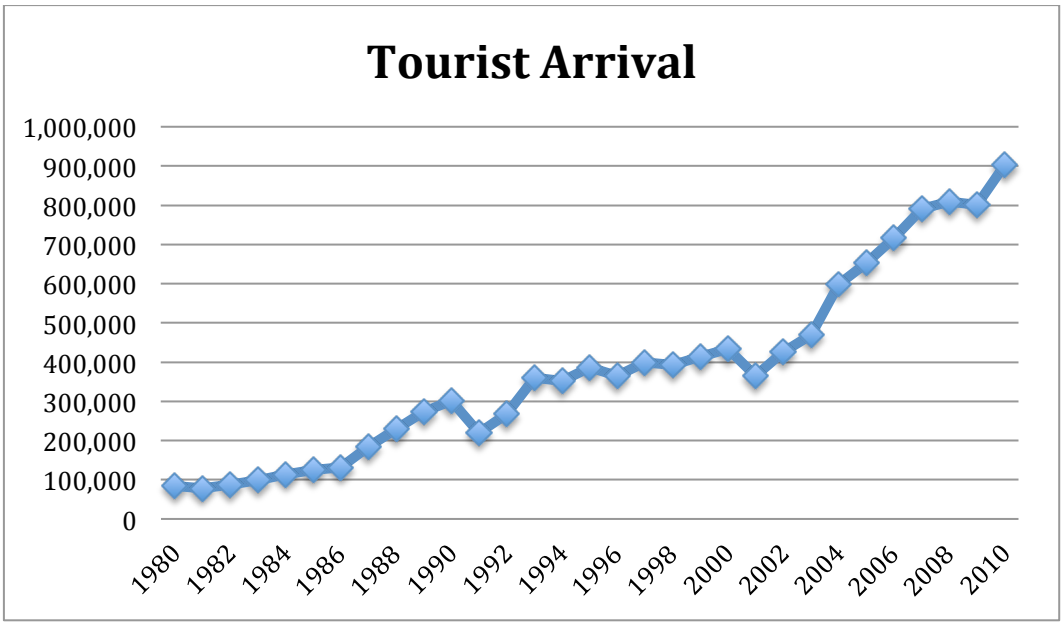
Table 11. Average of unemployment

INDICATOR NAME	YEAR	TRNC
UNEMPLOYMENT RATE	1980-1989	2.23%
UNEMPLOYMENT RATE	1990-1999	1.04%
UNEMPLOYMENT RATE	2000-2010	7.00%
AVERAGE	1980-2010	3.42%

The chart above shows the annual unemployment rates of TRNC from 1980 to 2010. From 1980 to 2003, the unemployment rate steadily decreased, but in 2003, this rate substantially increased. The lowest unemployment rate (0.75%) was reached in 1993, and the highest (12.40%) was realized in 2009.

Table 11 lists the averages of the unemployment rates in the sub-periods. From 1980 to 1990, the average unemployment rate in the country was 2.23. The second sub-period exhibited the lowest average unemployment rate, whereas the last sub-period exhibited the highest average unemployment rate.

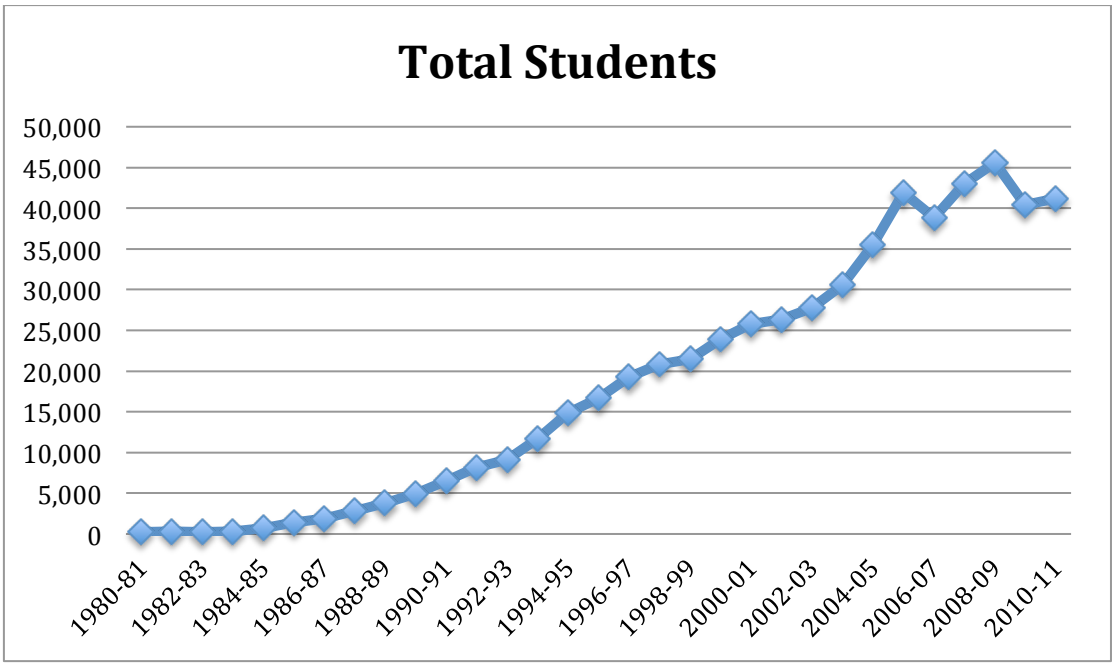
4.11 Analysis of the behavior of the total number of Tourist Arrival over 1980-2010



Graph 10. Tourist arrival in Turkish Republic of Northern Cyprus from 1980-2010

The graph above illustrates the annual tourist arrival data from 1980 to 2010. The number of tourists steadily increased during the period, except in 1990 and 2000. The lowest tourist volume (84,511) occurred in 2010, but thereafter, this volume increased and reached its highest level at 902,390. In 30 years, therefore, TRNC experienced an excellent increase of more than 1000% in tourist arrival. Nevertheless, such increase is insufficient.

4.12 Analysis of total number of students in Universities over 1980-2011

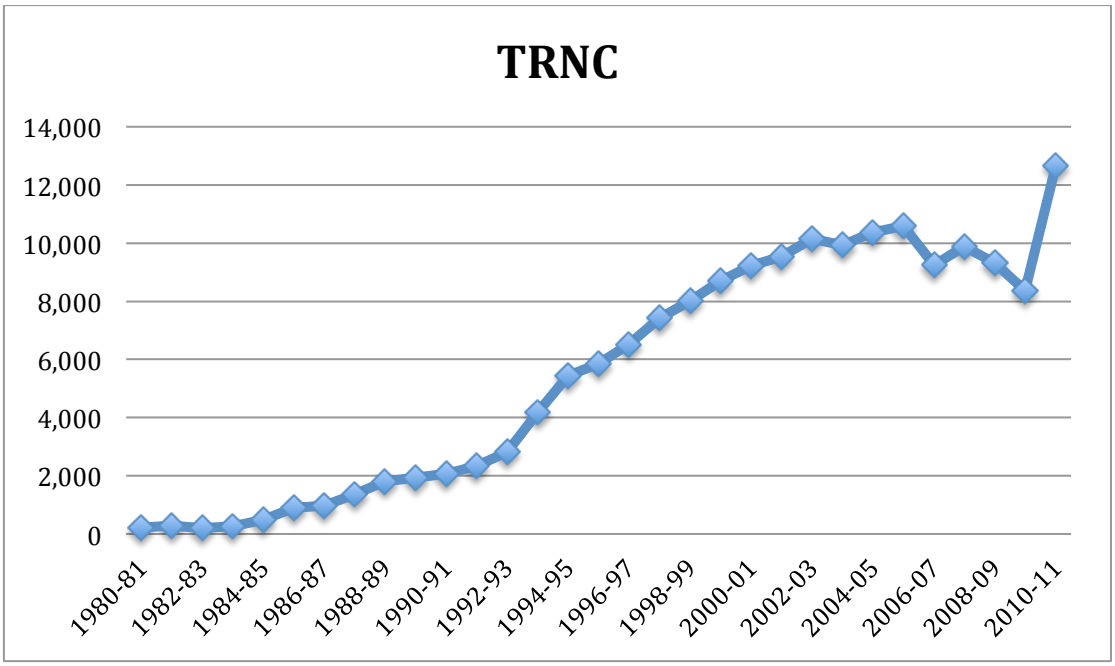


Graph 11. Total number of students in Universities in Turkish Republic of Northern Cyprus from 1980-2010

Graph 11 presents one of the most important macroeconomic determinants of macroeconomic performance, that is, the number of students enrolled in Turkish schools and universities. As Gusten (2014) stated in her article in the *New York Times*, young people from more than 100 countries study in TRNC, thereby making the education sector a leading driver of the country's economy.

As can be seen in the graph above, the total number of students increased on a daily basis during the period studied. The lowest volume was 215 students in 1980, but this figure increased to 41,230 in 2010. The highest number of students recorded in 30 years is 45,634, which was realized in 2008–2009.

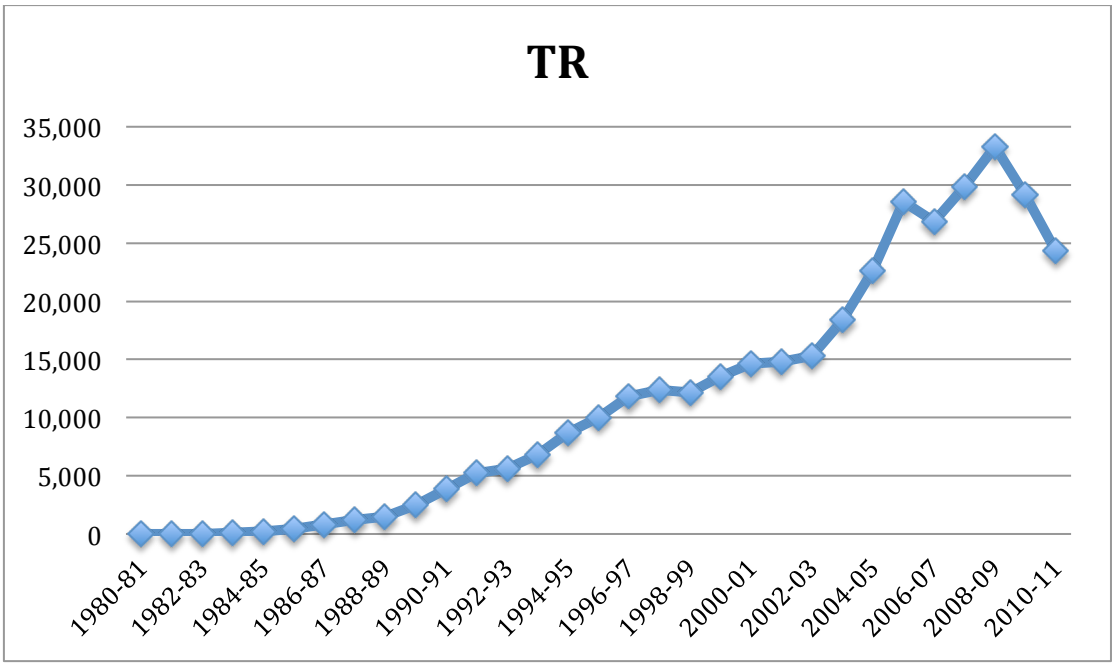
4.13 Analysis of the behavior of the total number of Turkish Cypriot students in the Universities of Turkish Republic of Northern Cyprus



Graph 12. Turkish Cypriot students in Universities in Turkish Republic of Northern Cyprus from 1980-2010

Graph 12 indicates the number of Turkish Cypriot students, who account for only 20% of the total in TRNC. The number of Turkish Cypriot students was 215 in 1980–1981. In 30 years, this number increased to 12,666. The reason for this increase is the rise in population and opportunities in the country. Another issue worth noting is that the literacy rate of the Turkish Cypriot population is 97%, which is a tremendous percentage for a developing country.

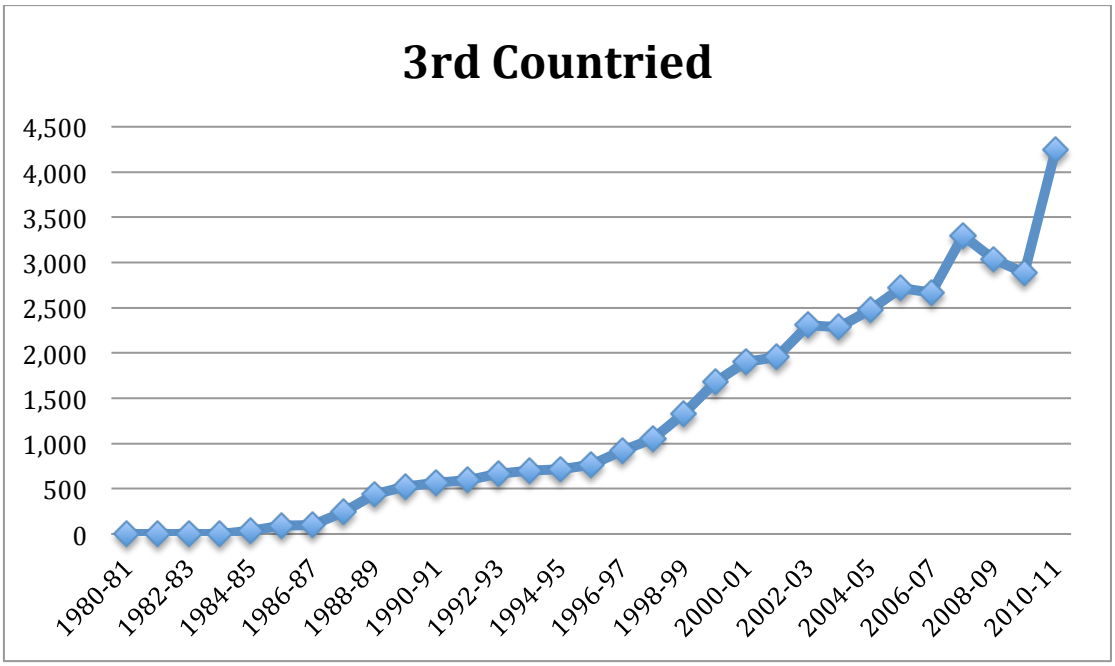
4.14 Analysis of students from Turkey in Universities of Turkish Republic of Northern Cyprus



Graph 13. Students from Turkey in Universities in Turkish Republic of Northern Cyprus from 1980-2010

The graph above shows the number of Turkish students enrolled in TRNC schools and universities from 1980–1981 to 2010–2011. Most of these students obtain education from the country's universities. In 1980, no students enrolled in the universities in the country. From that period, the number of university students increased every year until 2005–2006. The highest number of enrollees recorded in 30 years is 33,288. Between 2008 and 2009, a sudden decrease in the number of Turkish students occurred.

4.15 Analysis of students from other countries in Universities of Turkish Republic of Northern Cyprus



Graph 14. Students from other countries in Universities of Turkish Republic of Northern Cyprus from 1980-2010

Graph 14 indicates the number of students from other countries, excluding Turkey. In 1980, no such students enrolled in TRNC universities, but a steady increase in the influx of students occurred thereafter. In 2010–2011, the number of students from other countries increased to 4248.

Chapter 5

COMPARATIVE ANALYSIS OF MACROECONOMIC VOLATILITY OF THE ECONOMY OF NORTH CYPRUS

This chapter discusses the comparative analysis of macroeconomic performance, which I examined by calculating the standard deviations of the selected macroeconomic parameters over the studied period. The variables chosen for this analysis are real GDP; GDP growth rates; real consumption; real consumption as a share of GNP; real investment; investment as a share of GDP; unemployment and inflation rates; total reserves of the central bank; general government budget balance (% of GNP); and share of exports in GDP. The standard deviations of all these parameters from 1980 to 2010 are listed in Table 12.

5.1 Volatility of Selected Macroeconomic Parameters

Table 12. Summary of volatility of selected macroeconomic parameters

Parameter	1980-1989	1990-1999	2000-2010	1980-2012
GDP (Level)	1.3	2	0.7	4.5
Growth rates of GDP	0.053	0.045	0.082	0.059
Consumption (level)	1.3	2.0	0.6	4.42
Consumption (% of GNP)	0.0562	0.0273	0.0335	0.044
Investment (Level)^2	1.3	2.0	0.8	4.8
Investment (% of GDP)	0.018	0.023	0.032	0.027
Unemployment rate	0.68	0.18	4.53	3.75
Inflation rate	0.185	0.483	0.232	0.40
Foreign Currency Deposits	1.5	2.4	2	1.95
Government Balance (% of GNP)	0.0266	0.0294	0.0540	0.0420
Export (% of GDP)	0.0220	0.0174	0.0104	0.0631

The above-mentioned table illustrates the key insights obtained from the comparative analysis of volatility measures. The macroeconomic parameters whose volatilities decreased over 2000–2010 include real GDP, share and level of real consumption as a proportion of GNP, and share of exports in GDP. The volatility of GDP improved in the last decade relative to the first and second sub-periods. As shown in the table, such volatility decreased over 2000–2010 relative to the previous two sub-periods. By contrast, the GDP growth rate did not show improvement. The other critical parameters that improved are GNP and share of consumption in GNP.

The volatility of investment rate decreased to 0.8 from 2000 to 2010 compared with that observed in 1980 to 1990. Furthermore, the volatility of investment share in GDP decreased from 3.2 in the last sub-period to 2.3 in the second sub-period. Parallel to the increase in inflation rate to an average of 0.0232 in relation to 0.0185

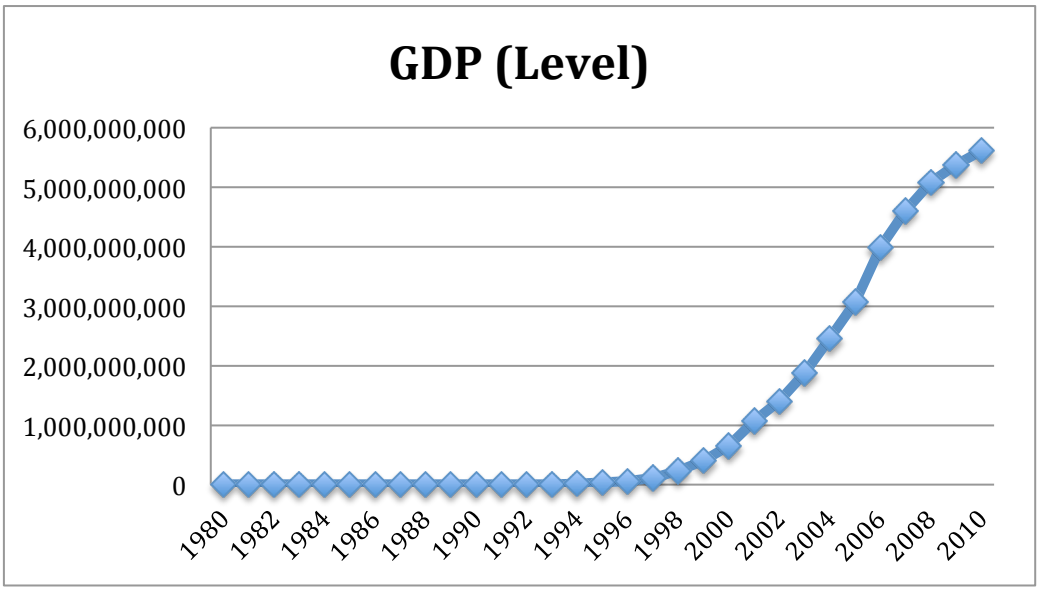
in the first sub-period (1980–1990), the volatility of total reserves increased from 1.5 (1980–1990) to 2 (2000–2010). The comparison of inflation rate volatility between the second and third sub-periods shows a dramatic decrease from 0.483 to 0.232. According to Al-Mahrubi (1997), changes in inflation volatility are correlated with GDP growth in the long term.

Unemployment volatility sharply increased from 0.68 to 4.53. The volatility of the growth and inflation rates in TRNC is correlated with the unemployment rate. Accordingly, the rise in the volatility of the growth and inflation rates may have affected the unemployment rate over the same period.

The graphs and tables below illustrate the detailed analysis of the standard deviation of each macroeconomic indicator from 1980 to 2010. Standard deviation is a statistical measurement that reflects the volatility of a given indicator. This measurement therefore enables researchers to determine the extent of difference between total data and average data.

5.1 Comparative analysis of volatility of level of real GDP and real growth rate of GDP in Turkish Republic of Northern Cyprus

5.1.1 Comparative analysis of volatility of level of real GDP in Turkish Republic of Northern Cyprus

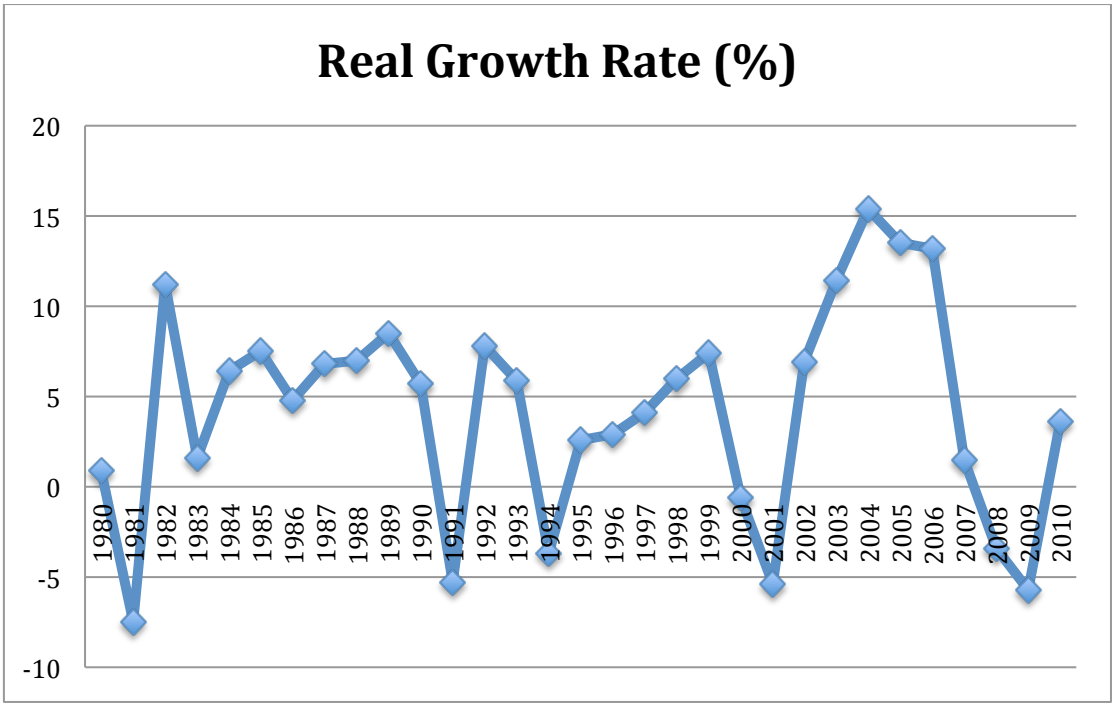


Graph 15. Level of real GDP for Turkish Republic of Northern Cyprus for period 1980-2010

Table 13. Level of real GDP volatility from 1980-2010

INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
GDP (LEVEL)	1980-1989	1.3
GDP (LEVEL)	1990-1999	2
GDP (LEVEL)	2000-2010	0.7
GDP (LEVEL)	1980-2010	4.5

5.1.2 Comparative analysis of volatility of growth rate of GDP in Turkish Republic of Northern Cyprus



Graph 16. Growth rate GDP for Turkish Republic of Northern Cyprus for period 1980-2010

Table 14. Growth rate of GDP volatility from 1980-2010

INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
GROWTH RATE OF GDP	1980-1989	0.053
GROWTH RATE OF GDP	1990-1999	0.045
GROWTH RATE OF GDP	2000-2010	0.082
GROWTH RATE OF GDP	1980-2010	0.059

GDP and GDP growth rate are two critical macroeconomic parameters for the comparative analysis of macroeconomic performance. The stable volatility of these parameters is preferred for stable economic growth.

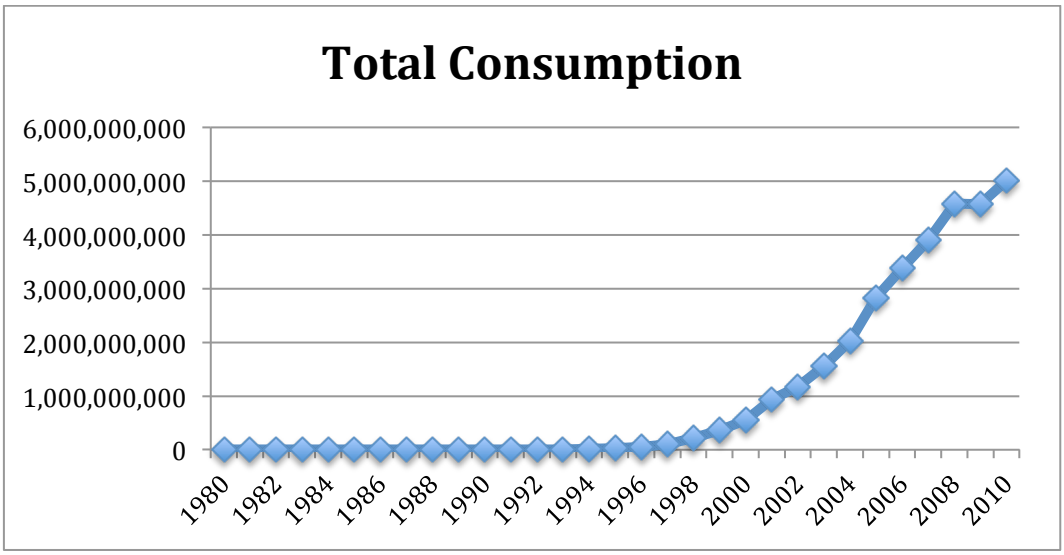
Table 13 shows the standard deviation values of the GDP in TRNC in the three sub-periods. In 1980–1990, TRNC had a standard deviation of 1.3. In 1990–2000, the GDP volatility increased to 2. The lowest GDP standard deviation, 0.7, was reached in 2000–2010. From 1980 to 2010, the volatility of GDP was 4.5. Accordingly, TRNC experienced a decrease in its GDP.

Table 14 shows the volatility of GDP growth rate from 1980 to 2010. In the first sub-period (1980–1990), TRNC exhibited a standard deviation of GDP growth rate of 0.053. From 1990 to 2000, the standard deviation decreased to 0.045. In the third sub-period, TRNC achieved its highest standard deviation at 0.082. The comparison of the first and third sub-periods indicates a noticeable increase in the overall volatility of the GDP growth rate.

A stable increase in the growth of real GDP is possible with changes in economic environments and structural modifications, such as technological innovations. Stabilizing monetary policy and reducing the possibility of economic shocks to the variability of economic growth can also facilitate stable growth.

5.2 Comparative analysis of volatility of level of real consumption and real consumption as a share of GNP in Turkish Republic of Northern Cyprus

5.2.1 Comparative analysis of volatility of level of real consumption in Turkish Republic of Northern Cyprus

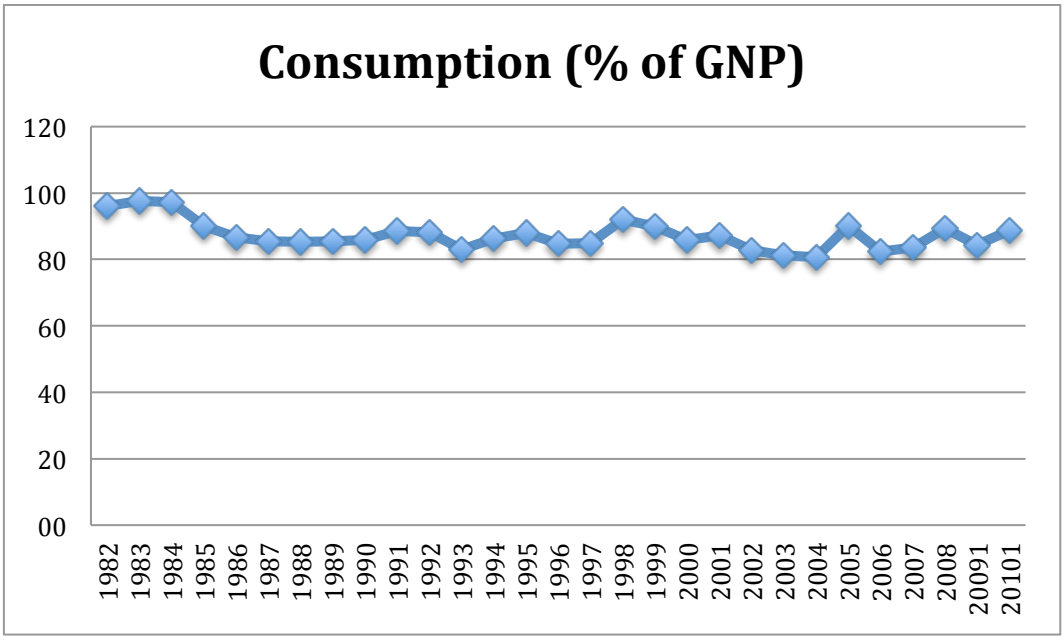


Graph 17. Level of real consumption for Turkish Republic of Northern Cyprus for period 1980-2010

Table 15. Level of real consumption volatility from 1980-2010

INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
CONSUMPTION (LEVEL)	1980-1989	1.3
CONSUMPTION (LEVEL)	1990-1999	2.0
CONSUMPTION (LEVEL)	2000-2010	0.6
CONSUMPTION (LEVEL)	1980-2010	4.42

5.2.2 Comparative analysis of volatility of real consumption as a share of GNP in Turkish Republic of Northern Cyprus



Graph 18. Real consumption as a share of GNP for Turkish Republic of Northern Cyprus for period 1980-2010

Table 16. Real consumption as a share of GNP volatility from 1980-2010

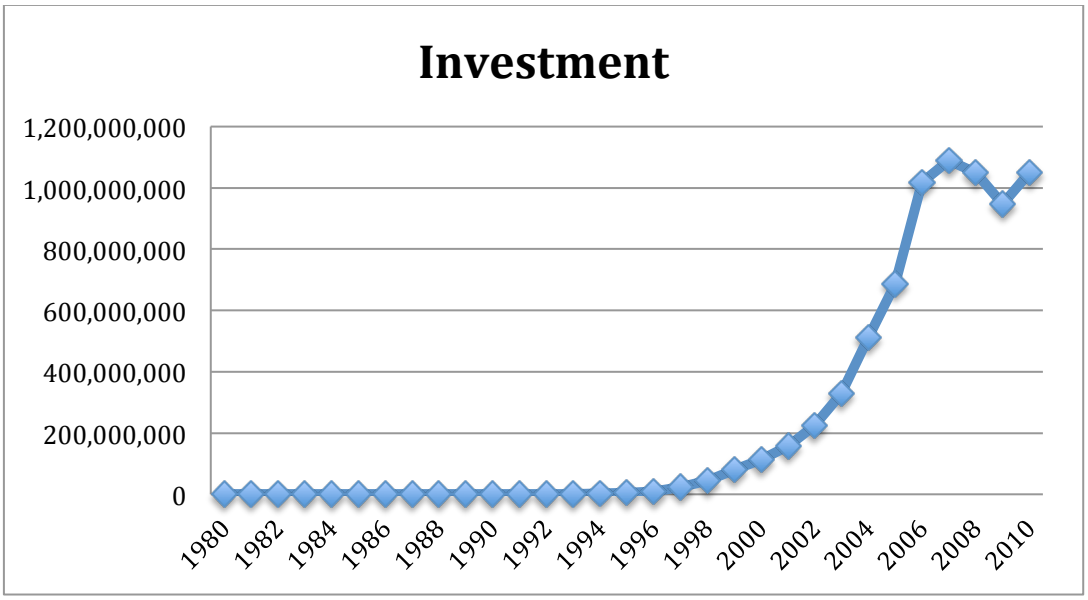
INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
CONSUMPTION (% of GNP)	1980-1989	0.056
CONSUMPTION (% of GNP)	1990-1999	0.027
CONSUMPTION (% of GNP)	2000-2010	0.034
STANDARD DEVIATION	1980-2010	0.044

Section 5.2 shows the comparative analysis of the volatility of consumption and real consumption as a share of GNP from 1980 to 2010. Consumption volatility is another critical parameter for calculating macroeconomic risk. Table 15 indicates the volatility of consumption. From 1980 to 1990, the standard deviation of consumption was 1.3. In the succeeding period, the volatility increased to 2.0. In 2000–2010, this volatility improved, and the standard deviation dropped to 0.6. This decrease in consumption may be attributed to the volatility of international risk sharing, which may also increase individual welfare.

Table 16 indicates the volatility of consumption as a share of GDP from 1980 to 2010. The highest standard deviation occurred in 1980–1990, but this value decreased to 0.0273 in the succeeding sub-period. From 2000 to 2010, the volatility of consumption as a share of GNP increased to 0.035. Risk-averse individuals prefer stable and smooth consumption. Therefore, consumption growth may accompany low consumption volatility.

5.3 Comparative analysis of volatility of level of real investment and real investment as a share of GDP in Turkish Republic of Northern Cyprus

5.3.1 Comparative analysis of volatility of level of real investment in Turkish Republic of Northern Cyprus

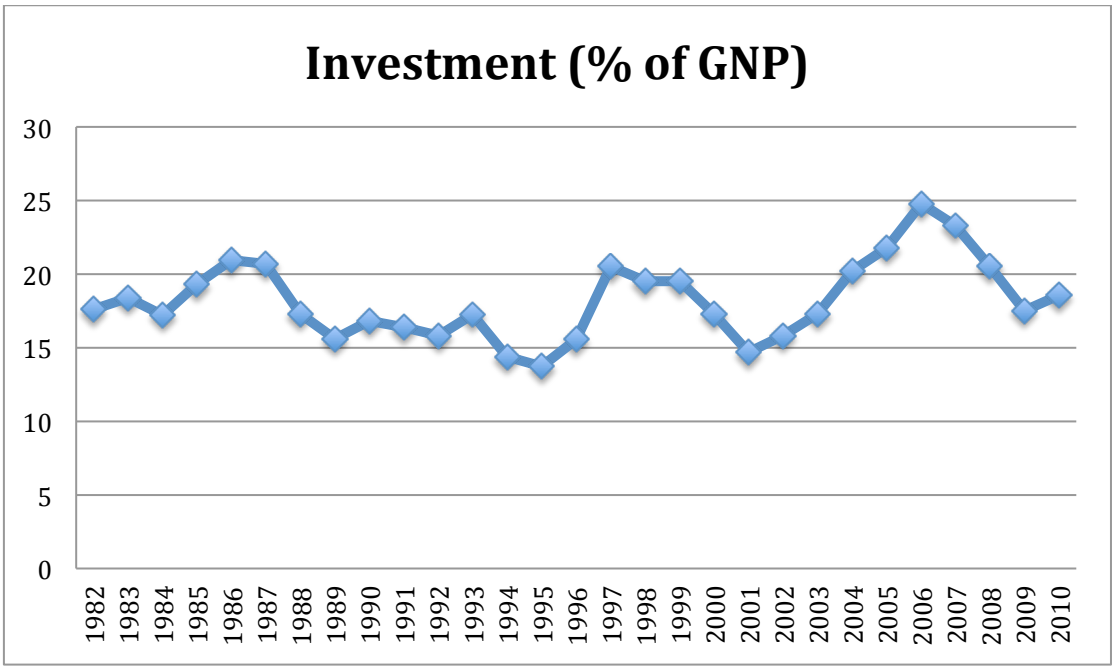


Graph 19. Level of real investment for Turkish Republic of Northern Cyprus for period 1980-2010

Table 17. Level of real investment volatility from 1980-2010

INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
INVESTMENT (LEVEL)	1980-1989	1.3
INVESTMENT (LEVEL)	1990-1999	2.0
INVESTMENT (LEVEL)	2000-2010	0.8
INVESTMENT (LEVEL)	1980-2010	4.8

5.3.2 Comparative analysis of volatility of investment as a share of GNP in Turkish Republic of Northern Cyprus



Graph 20. Real investment as a share of GNP for Turkish Republic of Northern Cyprus for period 1980-2010

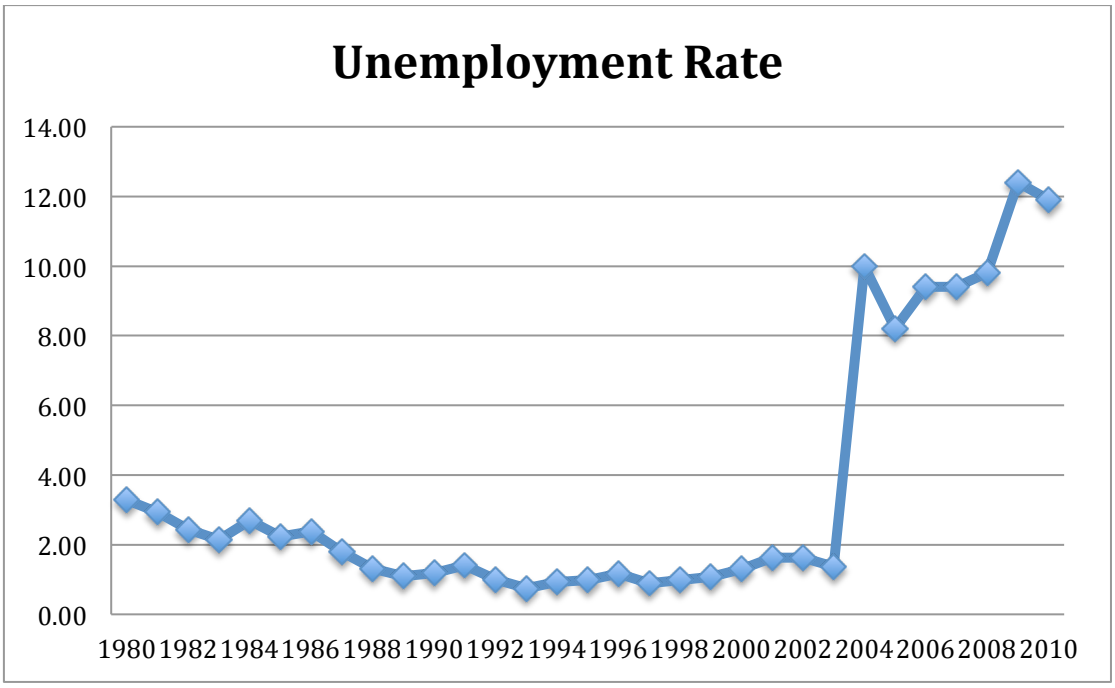
Table 18. Real investment as a share of GNP volatility from 1980-2010.

INDICATOR NAME	YEAR	VOLATILITY (STANDARD DEVIATION)
INVESTMENT (% of GNP)	1980-1989	0.018
INVESTMENT (% of GNP)	1990-1999	0.023
INVESTMENT (% of GNP)	2000-2010	0.032
INVESTMENT (% of GNP)	1980-2010	0.027

Section 5.3 presents the comparative analysis of the volatility of investment and real investment as a share of GDP from 1980 to 2010. The volatility of a country's macroeconomic performance determines investment level. Investment volatility in TRNC improved from 1.3 (1980–1990) to 0.8 (2000–2010) (Table 9). In 1990–2000, the standard deviation of investment reached 2.0.

Table 18 presents real investment as a share of GDP. The volatility of investment as a share of GDP declined in each sub-period. The lowest standard deviation, 0.018, occurred in 1980–1990. This value increased to 0.023 in the second sub-period and to 0.032 in the third sub-period.

5.4 Comparative analysis of volatility of unemployment rate in Turkish Republic of Northern Cyprus



Graph 21. Unemployment rate for Turkish Republic of Northern Cyprus for period 1980-2010

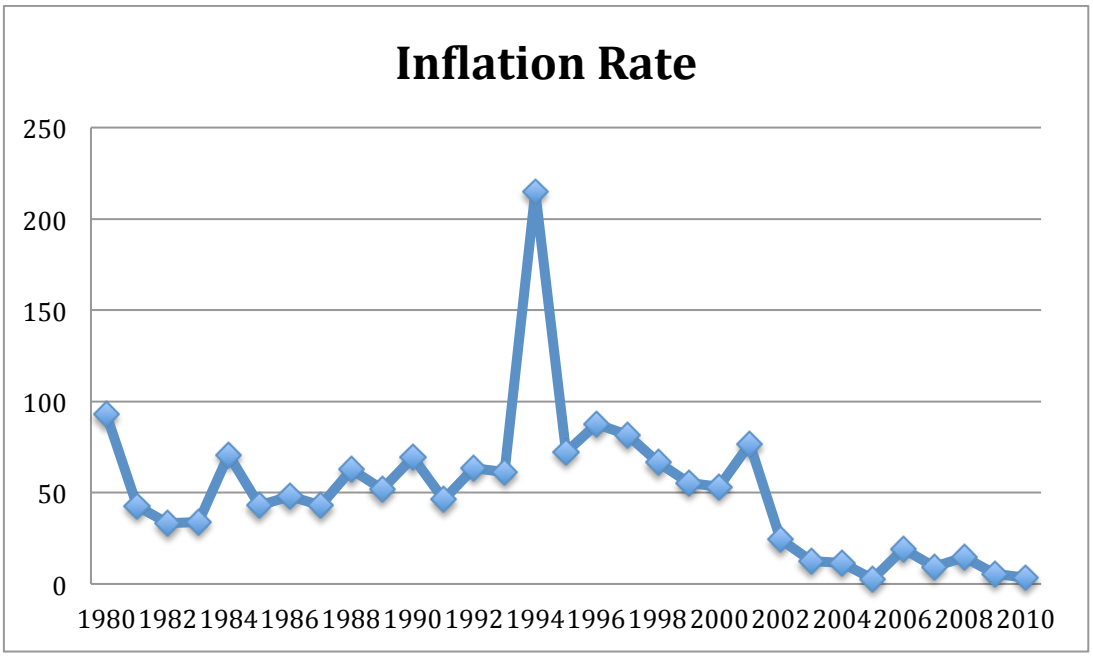
Table 19. Volatility of unemployment rate from 1980-2010

INDICATOR NAME	YEAR	VOLATILIY (STANDARD DEVIATION)
UNEMPLOYMENT RATE	1980-1989	0.68
UNEMPLOYMENT RATE	1990-1999	0.18
UNEMPLOYMENT RATE	2000-2010	4.53
UNEMPLOYMENT RATE	1980-2010	3.74

Table 19 presents the results of the comparative analysis of unemployment rate volatility in TRNC from 1980 to 2010. The standard deviation of unemployment rate decreased from 0.68 in 1980–1990 to 0.18 in 1990–2000. In the succeeding sub-period, the standard deviation dramatically increased, and volatility increased to 4.53.

The graph above indicates the dramatic change in TRNC's annual unemployment rate in 2003. From 2003 to 2010, the unemployment rate increased, which may be attributed primarily to the lack of real growth in TRNC. Additionally, advancements in technology can decrease the need for labor. In the country, the proportion of highly educated and skilled labor is very high compared with that in other countries. Therefore, cheap and unskilled labor was imported from other nations, such as Turkey, the Philippines, and Turkmenistan. Layoffs in the government sector and corruption in government may also account for the dramatic change in TRNC's unemployment rate. In any case, this huge change requires another detailed analysis to determine the strategic factors that caused the change.

5.5 Comparative Analysis of volatility of inflation in Turkish Republic of Northern Cyprus.



Graph 22. Inflation Rate for Turkish Republic of Northern Cyprus for period 1980-2010

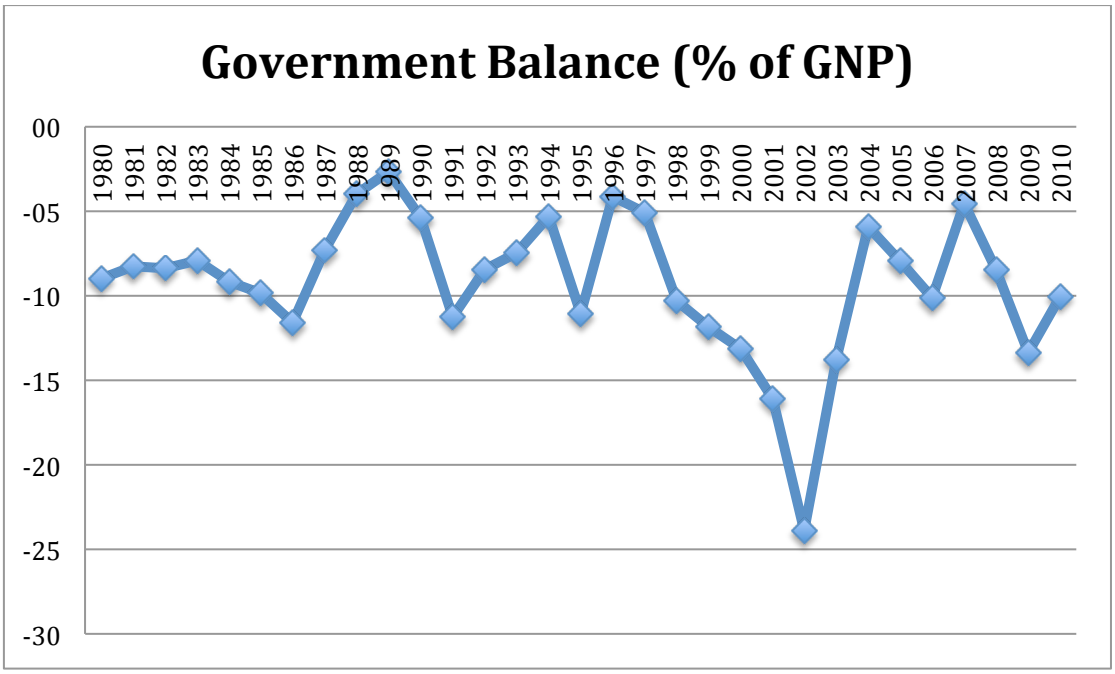
Table 20. Volatility of Inflation rate from 1980-2010

INDICATOR NAME	YEAR	VOLATILIY (STANDARD DEVIATION)
INFLATION RATE	1980-1989	0.185
INFLATION RATE	1990-1999	0.483
INFLATION RATE	2000-2010	0.232
INFLATION RATE	1980-2010	0.40

Table 20 shows the findings of the comparative analysis of inflation rate volatility in TRNC from 1980 to 2010. In the first sub-period (1980–1990), the standard deviation of inflation rate was 0.0185. In the succeeding decade, this value dramatically increased to 0.0483. In 2000–2010, the standard deviation decreased to 0.0232.

Researchers have indicated that GDP growth exerts important effects on the volatility of inflation in the long term. Consequently, high inflation volatility is harmful to long-term GDP growth. Inflation rate volatility is also correlated with unemployment rate; that is, the volatility of inflation rate may affect the rate of unemployment. Furthermore, fiscal and monetary policies may have been the factors that caused the changes in the inflation rate volatility of TRNC.

5.6 Comparative analysis of volatility of general government balance as a share of GNP in Turkish Republic of Northern Cyprus



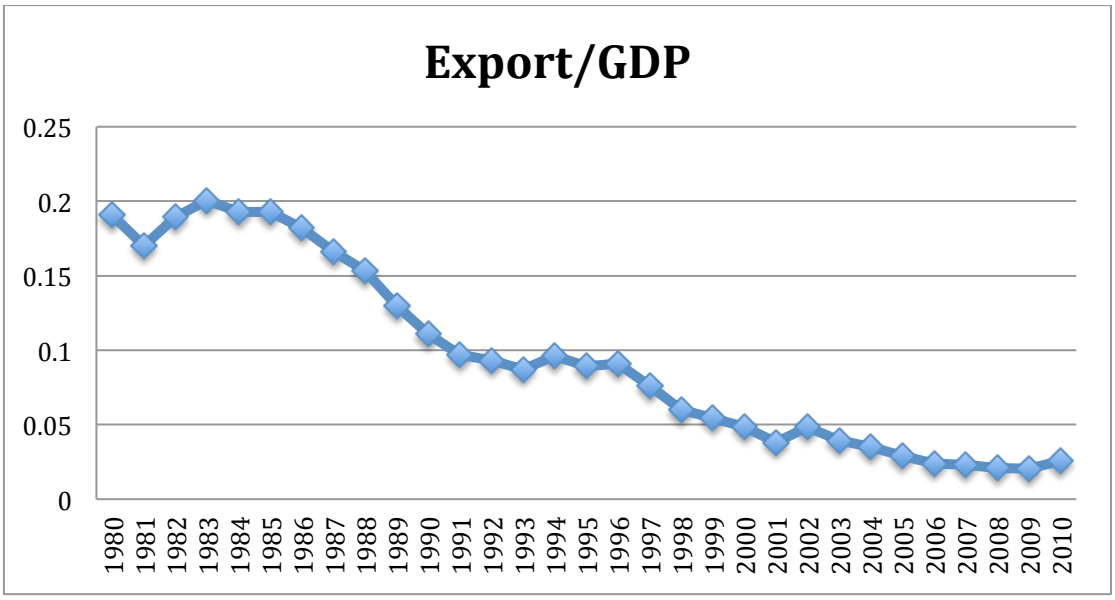
Graph 23. General government balance as a share of GNP for Turkish Republic of Northern Cyprus for period 1980-2010

Table 21. Volatility of general government balance as a share of GNP from 1980-2010.

INDICATOR NAME	YEAR	VOLATILIY (STANDARD DEVIATION)
GOVERNMENT BALANCE (% OF GNP)	1980-1989	0.0266
GOVERNMENT BALANCE (% OF GNP)	1990-1999	0.0294
GOVERNMENT BALANCE (% OF GNP)	2000-2010	0.054
GOVERNMENT BALANCE (% OF GNP)	1980-2010	0.0420

Table 21 shows the volatility of government balance as a percentage of GNP. This volatility was determined by calculating the standard deviations in 1980–2010. In the first (1980–1990), second (1990–2000), and third (2000–2010) sub-periods, the volatilities of government balance were 0.0266, 0.0294, and 0.054, respectively.

5.7 Comparative analysis of volatility of export as a share of GDP in Turkish Republic of Northern Cyprus



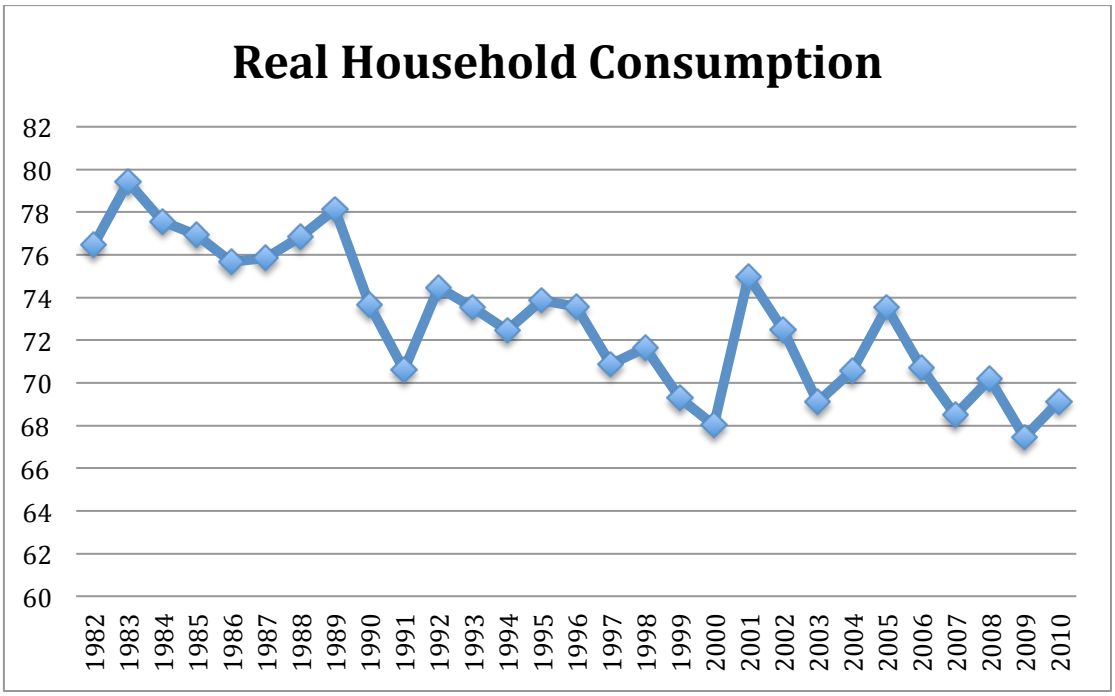
Graph 24. Export as a share of GDP for Turkish Republic of Northern Cyprus for period 1980-2010

Table 22. Volatility export as a share of GNP from 1980-2010

INDICATOR NAME	YEAR	VOLATILIY (STANDARD DEVIATION)
EXPORT (% OF GDP)	1980-1989	0.0220
EXPORT (% OF GDP)	1990-1999	0.0174
EXPORT (% OF GDP)	2000-2010	0.0104
EXPORT (% OF GDP)	1980-2010	0.0631

Table 22 above shows the results of the comparative analysis of volatility of export as a share of GDP from 1980 to 2000. The standard deviation of export as a share of GDP steadily decreased. The highest volatility of export as a share of GDP was 0.0220, achieved in 1980–1990. In 1990–2000 and 2000–2010, this value decreased to 0.0174 and then to 0.0104, which is the lowest rate recorded in TRNC from 2000 to 2010.

5.8 Comparative analysis of volatility of real household consumption in Turkish Republic of Northern Cyprus



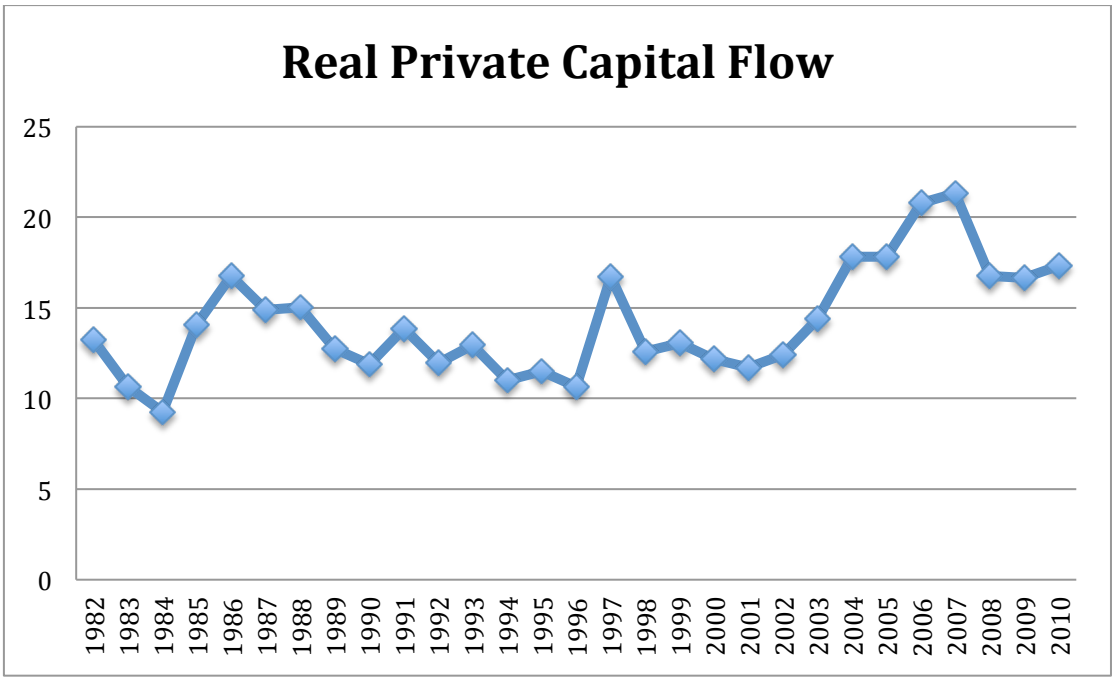
Graph 25. Real Household consumption for Turkish Republic of Northern Cyprus for period 1982-2010

Table 23. Summary of Household final consumption's standard deviation from 1982-2010

INDICATOR NAME	YEAR	VOLATILIY (STANDARD DEVIATION)
HOUSEHOLD FINAL CONSUMPTION	1982-1989	1.3
HOUSEHOLD FINAL CONSUMPTION	1990-1999	2.0
HOUSEHOLD FINAL CONSUMPTION	2000-2010	0.6
HOUSEHOLD FINAL CONSUMPTION	1980-2010	4.4

Graph 24 and Table 23 illustrate that the standard deviation of household final consumption in TRNC steadily increased. From 1982 to 1989, the country exhibited the lowest standard deviation at 1.3. In the second sub-period (1990–2000), the standard deviation of household final consumption reached 2. In the third sub-period, TRNC had the lowest volatility with a standard deviation of 0.6.

5.9 Comparative analysis of volatility of real household consumption in Turkish Republic of Northern Cyprus



Graph 26. Real private capital flow for Turkish Republic of Northern Cyprus for period 1982-2010

Table 24. Summary of Private capital flows' standard deviation from 1982-2010

INDICATOR NAME	YEAR	TRNC
PRIVATE CAPITAL FLOWS	1982-1989	2.44
PRIVATE CAPITAL FLOWS	1990-1999	1.75
PRIVATE CAPITAL FLOWS	2000-2010	3.29
STANDARD DEVIATION	1980-2010	3.03

The table above shows the standard deviation of private capital flows in TRNC. In the first sub-period (1982–1989), the standard deviation was 2.44. In the succeeding sub-period, TRNC exhibited the lowest standard deviation at 1.75. From 1980 to 2010, the standard deviation was 3.03, which is the highest value across the entire period studied.

Chapter 6

AN ECONOMETRIC ANALYSIS OF POSSIBLE DETERMINANTS OF ECONOMIC GROWTH IN NORTH CYPRUS

In this chapter, I use regression analysis to investigate the relationship between various macroeconomic parameters and economic growth of Turkish Republic of Northern Cyprus. Such parameters include trade openness, inflation, investment over GDP, shares of traded goods in GDP (Agriculture over GDP plus Manufacture over GDP) , share of service in GDP.

I use the table below to explain the coefficients, standard errors, t-statistics, and probabilities of the variables. The results were fitted to an equation to investigate the relationship and significance between the variables. T-statistics are denoted with one asterisk (*) to indicate 10% significance, two asterisks (**) to reflect 5% significance, and three asterisks (***) for 1% significance. T-values that are not denoted with these marks are nonsignificant.

All the data in this study are expressed in percentage; the coefficients of regressions provide the value of elasticity between dependent and independent variables. Saving and investment rates were separately treated in the regressions to prevent multicollinearity because these variables are highly correlated with each other. For

the same reason, shares of traded goods and service in GDP were also treated separately.

Names of the variables used in this section are as follows:

Dependent Variable:

Y_t= Annual Growth Rate of GDP at time

Explanatory Variables:

X_1= Share of Service in GDP (%)

X_2= Trade openness (%)

X_3= Investment Rate (%)

X_4= Share of traded goods in GDP (%)

X_5= Share of manufacturing in GDP (%)

X_6= Share of agriculture in GDP (%)

Appreciations of the variables used are as follows:

Y_t= GDP growth

X_1= SERVICE

X_2= TO

X_3= INVEST

X_4= SECT

X_5= MAN

X_6= AGR

6.1 Effect of Share of Service in GDP, Trade openness, and Investment rate on Growth Rate of GDP

Table 25. Regression analysis of Growth Rate of GDP 1

Dependent variable: GDP growth				
Variable	Coefficient	Std. Error	T-statistic	Probability
SERVICE	0.098	0.044	2.253	0.032
TO	0.114	0.061	1.861	0.073
INVEST	0.783	0.366	2.140	0.041
Constant	-24.530	8.721	-2.813	0.009

R-squared= 0.288
Adjusted R-squared= 0.214
S.E of regression= 5.137
Sample period= 1978- 2011
Number of observation= 33

GDP Growth= -24.530 + 0.098SERVICE + 0.114TO + 0.783INVEST

(-2.812)*** (2.253)** (1.861)* (2.140)**

The results indicate a positive relationship between growth rate and share of service in GDP and trade openness and investment. A 1% increase in share of service caused a 0.098% increase in growth rate in the long run when all the other variables were held constant. A 1% increase in trade openness caused a 0.11% rise in growth rate, and a 1% increase in investment rate caused a 0.78% increase in growth rate when all the other variables were held constant. All the coefficients were significant.

6.2 Effect of Investment rate, Trade openness and Share of Traded goods in GDP on Growth Rate of GDP

Table 26. Regression analysis of Growth Rate of GDP 2

Dependent variable: GDP growth				
Variable	Coefficient	Std. Error	T-statistic	Probability
INVEST	0.783	0. 366	2.139	0.041
TO	0.114	0.061	1.860	0.073
SECT	-0.098	0. 043	-2.251	0.032
C	-14.683	7.769	1.890	0.069

R-squared= 0.287
Adjusted R-squared= 0.214
S.E of regression= 5.138
Sample period= 1978- 2011
Number of observation= 33

GDP Growth= -14.682 + 0.783INVEST + 0.114TO - 0.098SECT

(-1.890)* (2.139)** (1.859)* (-2.251)**

A negative relationship existed between share of sector in GDP and growth rate, but a positive relationship occurred between investment over GDP and trade openness versus growth rate. A 1% increase in share of sector caused a 0.098% decrease in growth rate. A 1% increase in investment over GDP caused a 0.78% increase in growth rate when the other variables were held constant. Similarly, a 1% increase in TRNC's trade openness resulted in a 0.11% rise in growth rate. Therefore, a negative coefficient indicates that in the long run, an increase in the share of traded goods sectors (share of manufacturing + agricultural sector) in GDP is likely to negatively affect the long-term growth rate of GDP. By contrast, SECT is likely to increase the growth rate of GDP. All the coefficients were significant.

6.3 Effect of Share of Investment over GDP, Trade openness, Share of Manufacturing and Share of Agriculture in GDP on Growth Rate of GDP

Table 27. Regression analysis of Growth Rate of GDP 3

Dependent variable: GDP growth				
Variable	Coefficient	Std. Error	T-statistic	Probability
INVEST	0.815	0.377	2.159	0.040
TO	0.104	0.063	1.660	0.108
MAN	0.114	0.814	0.139	0.890
AGR	-0.097	0.051	-1.893	0.069
C	-15.505	8.031	-1.931	0.064

R-squared= 0.291
Adjusted R-squared= 0.186
S.E of regression= 5.305
Sample period= 1979 - 2011
Number of observation= 32

GDP Growth= -15.506 + 0.814INVEST + 0.104TO + 0.114IMAN - 0.097AGR

(-1.931)* (2.159)** (1.660) (0.139) (-1.93)*

A negative relationship existed between share of agriculture in GDP and growth rate, whereas a positive relationship occurred among investment rate, trade openness and share of manufacturing sector in GDP. A 1% rise in share of agriculture in GDP caused a 0.097% decrease in growth rate. A 1% increase in investment rate produced a 0.814% increase in growth rate. A 1% increase in trade openness resulted in a 0.104% increase in growth rate, and a 1% increase in share of manufacturing sector in GDP caused a 0.114% increase in growth rate when the other variables were held constant. The coefficients of investment rate, trade

openness, and share of agriculture in GDP were significant, but the coefficient of share of manufacturing sector in GDP was nonsignificant.

Chapter 7

CONCLUSION

This thesis particularly focused on a comparative analysis of selected macroeconomic parameters and their volatility levels over the period 1980–2010 and on a regression analysis of growth experience in TRNC. Regressions were carried out to validate the significance of variables for growth. I also compared the results for TRNC and Southern Cyprus. The main findings are summarized as follows.

Inflation rate and trade openness are two important factors for GDP growth rate. Because of the negative relationship between inflation and GDP growth and the increase in inflation rate in TRNC, the growth rate of GDP is expected to decrease in the long run. Conversely, a positive relationship was found between trade openness and growth rate. Therefore, an increase in trade openness is expected to increase GDP growth rate.

The trade openness of Southern Cyprus is 43% higher than that of TRNC. In addition, the inflation rate of the former is 46% lower than that of the latter. On the basis of these rates, the GDP growth rate of Southern Cyprus should be higher than that of TRNC. As shown by the percentage of growth rate from 1980 to 2010, however, the two countries are almost identical in terms of GDP growth rate.

A significant increase in the unemployment rate, general government balance (% of GDP), and current account balance (% of GDP) of TRNC occurred in the sub-

periods. These macroeconomic parameters are negatively correlated with GDP growth rate. Contrastingly, an important decrease occurred in the inflation rate, export-to-import ratio, and trade openness. The inflation rate positively affected the growth rate of GDP, but the other parameters exerted a negative influence in the long term.

Macroeconomic stability improved in the three sub-periods, as indicated by GDP level, consumption level, level of investment share of GNP in real consumption, and share of export in GDP. By contrast, GDP growth rate, real investment as a share of GDP, unemployment rate, inflation rate, foreign currency deposits, and government balance as a share of GNP increased.

The main aim of the regression analysis was to verify the effects of share of traded goods and service sector parameters on GDP growth. According to the literature, share of tradable goods sectors (e.g., manufacturing and agriculture) in GDP should increase to produce a positive effect on long-term growth rate because of the appreciable effects of share of manufacturing and agricultural goods in unemployment rate. Conversely, the regression analysis results in the current work indicate that share of traded goods negatively affects growth rate. This finding indicates that TRNC needs to improve operations in service sectors, such as tourism, the private sector, and the education sector, especially universities.

The comparative advantage of TRNC is its service sector. This major finding suggests that the government should direct its economic stimulation efforts toward the service sector, and not the agricultural and manufacturing sectors. Additionally,

development banks in TRNC should attach weight to the tourism and university sectors. This initiative will involve allocating credit primarily to the service sector, instead of the agricultural and manufacturing industries.

The number of students and tourists in TRNC increased on a daily basis. The State Planning Organization indicated that in the last 30 years, the level of tourist arrival increased to more than 1000%. Similarly, the total number of students in the country increased from 215 to more than 40,000 in the three sub-periods.

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