

The Relationship between Turkey's Financial Indicators and Economic Growth Rates

Huseyin Cetin

Abstract—Banking sector has many important roles for countries. The research objective is to unearth the short and long term relationship between Turkey's financial indicators and economic growth rates. The research was conducted with secondary data from Global Financial Development database. Financial parameters mainly for banking are separated and 19 financial variables relationships with Turkey's economic growth examined. For the period of 1999-2011, correlation matrix technique was used for 15 variables. For the period of 1970 and 2011, Turkey's gross domestic product taken as dependent variable and 5 banking indicators used as independent variables.

Index Terms—Private credits, stock market volatility, deposit money bank's asset to GDP, Turkey's economic growth rates.

I. INTRODUCTION

In recent years, Turkey's financial industry has been growing fast. Many international institutions have investment in Turkey's capital markets and banking sector. In addition, many multinational companies have joint venture agreement or have voting power in banking industry. Turkish government issues treasury bills and bonds for local and international investors. Moreover, many international companies have investment in Turkish capital market dubbed as "BIST". BIST transaction volume has been increasing fast. Private secondary industry plays major role for countries economic developments. Companies need loans to operate efficiently. Many banks have adjustments for loan interest rates payment. Turkey's interest rate was at %58 level at 1990's period. In addition, Turkey's interest rates has been diminishing since 2002's. With that situation, households and companies loan cost may not exceed that companies revenue. Although banks are now having lower interest rate revenue margin, they mainly use non-interest revenue system. That circumstance can still be costly for households and businesses.

In addition, banks deposits have been increasing fast since 2002 and more investments have been flowed to Turkey's capital markets. Although sometimes there may be fluctuations at Turkey's political and volatile financial system, Turkey's central bank reserves have been increasing. Due to low reserves of Turkey's central bank at 2001, Turkey achieved V type of economic growth. V type economic growth indicates about country economic growth index volatility. First of all, due to the banking crisis in Turkey,

Turkey's economic growth diminished and then Turkey's economic growth embarked to increase. Moreover, at May 2013, Gezi events existed at Turkey. At December 2013, political events at Turkey started to exacerbate. At those events, Turkey's central bank had difficult times. Turkish lira devalued against the American Dollar and Euro. Due to the large costs of increasing foreign exchange rates, central bank had more than billion dollars transactions to appreciate the value of Turkish lira against American dollar and Euro. Later on, Central bank again increased political interest rate.

In this article, main objective is to measure the impact of financial system indicators on Turkey's aggregate economic growth rates. There are two period intervals. Between the time period of 1970-2010, the short term and long term relationship between 5 banking indicators and economic growth will be measured. Moreover, due to the lack of data, between the period of 1999-2011, correlation matrix technique was used for 15 variables.

II. LITERATURE REVIEW

Ref. [1] indicated that some academic studies lead to unearth the relationship between finance and growth. Moreover, [1] mentioned that there can be important differences between countries in terms of relationship between finance and economic development.

Ref. [2] indicated that financial bridging can influence economic growth rates by giving importance to saving rates. [2] mentioned that savings channels should be used to increase investment rates and efficient savings rates for investment can increase social marginal productivity of investment..

Ref. [3] used the GMM estimator for 31 Chinese provinces. They found that development of financial market increase economic growth at provinces.

Ref. [4] used a sample of 44 Asia and Oceania countries to measure the role of FDI and financial sector development. They indicated that financial sector development plays a important role in further enhancing the benefits of FDI on economic growth and for this reason, [4] mentioned that FDI impact on economic growth is complementary.

Ref. [5] indicated that banking system development had a significant impact on economic growth of 14 members of Islamic conference in 1990-2009.

Nevertheless, [5] mentioned that private sector credits have negative and significant influence on economic growth of 14 members of Islamic conference between the period of 1990-2009.

Ref. [6] examined the relationship between financial intermediary development and economic growth for a panel

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Huseyin Cetin is with the Okan University, Turkey (e-mail: huseyincetin@okan.edu.tr).

of 74 developed and developing countries. Their research indicated that liquid liabilities and private credit have a statistically significant and positive effect on economic growth in both cross sectional and panel data.

Ref. [7] indicated that between 1981-2010, banks credit to private sector has statistically significant positive relationship with Nigeria's economic growth.

Based on the results of [8]'s, there is strong evidence that in Nigeria a significant and positive relationship exist between bank credit to the private sector and gross domestic product between 1960-2011.

By using Exponential Generalized Autoregressive Conditional Heteroskedasticity, [9] examined the relative contributions of stock market volatility on economic growth in Nigeria for the periods of 1980-2010. [9] found that stock market volatility has virtual long term negative impact on Nigeria's economy.

III. METHODOLOGY

The research was conducted with secondary data from Global Financial Development database. Financial parameters mainly for banking are separated and 19 financial variables relationships with Turkey's economic growth were examined. For the period of 1999-2011, correlation matrix technique was used for 15 variables. For the period of 1970 and 2011, Turkey's gross domestic product taken as dependent variable and 5 banking indicators used as independent variables. Due to long name of series, Table I was used for description of series.

TABLE I: DESCRIPTION OF SERIES

Series01	Gross Domestic Product
Series02	Bank credit to deposits
Series03	Domestic credit to private sector
Series04	Central bank's asset to GDP
Series05	Deposit money bank's asset to GDP
Series06	Financial System deposits to GDP

TABLE II: LINEAR REGRESSION TEST

C	0.08	0.0002
DSeries01 (-1)	0.08	0.7052
DSeries02	0.02	0.0063
DSeries02(-1)	0.007	0.46
DSeries03	-0.09	0.01
DSeries03(-1)	0.02	0.50
DSeries04	-0.06	0.10
DSeries04(-1)	0.02	0.54
DSeries06	0.12	0.00
DSeries06(-1)	-0.06	0.0588
MA(1)	-0.99	0.0

Coefficient *P* value

Augmented Dickey Fuller and Philips Perron test indicated that all of the series were nonstationary. By genr functions nonstationary series were converted into stationary series. Ordinary least square test was done with stationary variables. According to Table II results, bank credit to deposits ratio has significant impact on Turkey's economic growth rates

between the period of 1970-2011. Moreover, Table II results indicated that domestic credits to private sector has statistically negative impact on Turkey's economic growth rates for the period of 1970 and 2011. In addition, financial system deposits to GDP has statistically positive impact on Turkey's economic growth rates for the period of 1970 and 2011. Since there is high correlation between stationary financial system deposits to GDP and deposit money's bank's asset to GDP, deposits money's banks assets to GDP was used in other linear regression analysis. Deposits money bank's assets to GDP has significant impact on GDP. It can be argued that banking institutions asset utilization efficiency is significant for Turkish economy.

TABLE III: VECTOR ERROR CORRECTION MODEL

CoIntEq1	-0.02
D(Series01)(-1)	-0.58
D(Series01)(-2)	-0.13
D(Series02)(-1)	0.03
D(Series02)(-2)	0.01
D(Series03)(-1)	-0.07
D(Series03)(-2)	0.01
D(Series04)(-1)	-0.04
D(Series04)(-2)	0.003
D(Series05)(-1)	-0.14
D(Series05)(-2)	-0.07
D(Series06)(-1)	0.16
D(Series06)(-2)	0.02
C	0.29

TABLE IV: VECTOR AUTOREGRESSIVE MODEL

Lag0	-124	NA	2.71	6.67	6.76	6.70
Lag1	-114	18.16*	1.99*	6.36*	6.62*	6.45*
Lag2	-113	3.27	2.23	6.47	6.90	6.63
Lag3	-110	4.01	2.43	6.55	7.16	6.77

LogL LR FPE AIC SC HQ

TABLE V: AUTOREGRESSIVE DISTRIBUTED LAG MODEL
DEPENDENT VARIABLE (SERIES01) T STATISTICS

C	2.10
DSeries01(-1)	-2.65
DSeries05	2.08
DSeries05(-1)	-1.75
ECT(-1)	-2.57

Table V indicates Autoregressive Distributed Lag model. According to Table V's result, deposit money bank's asset to GDP has significant short term impact on Turkey's economic growth rates. According to Vector Error Correction model (Table III), first lag and second lag of deposit money bank's asset to GDP (series05) had negative adjustment effect on Turkey's economic growth rates.

In addition, residuals are collected from stationary variables's ordinary least square test. Residuals do not have unit root problem. Vector Autoregressive Test (Table IV) indicated that optimal lag structure for ARDL model is 1. Since sample size is 42, Akaike Information Criteria test (AIC) was used. Moreover, since optimal lag value found as 1 in Vector Autoregressive analysis, residuals's first lagged value was used to measure the long term impact of deposit money bank's asset to GDP on economic growth of Turkey. According to Auto Regressive Distributed Lag Model result,

first lag value of Error Correction term (ECT(-1))'s p value is 0.0145. That is less than 0.05 significance level. Nevertheless, Peseran Table (2001) has to be used to validate the result. Table VIII indicates partitioned Peseran's table. According to Peseran Table (2001), threshold T ratio value for without deterministic trend I (1) is -2.86. Table V indicated that first lag value of error correction term(ECT(-1))'s statistics is -2.573465. Since -2.575465 cannot exceed the Peseran Table (2001)'s critical threshold value(-2.86), it can be indicated that there is no long term relationship between deposit money bank's asset to GDP and Turkey's economic growth. That research result reject the Vector Error Correction model result (Table III).

In addition, Johansen cointegration test was used between Turkey's deposit money bank's asset to GDP and Turkey's economic growth rates. Variables were used as non-stationary; because linear combination of stationary variables gives researcher a spurious result. Table VI and Table VII indicate that there is no long term relationship between Turkey's deposit bank's asset to GDP and Turkey's economic growth rates.

TABLE VI: UNRESTRICTED COINTEGRATION RANK TEST (MAXIMUM EIGENVALUE) PROBABILITY

None	0.0665
At Most 1	0.3450

TABLE VII: UNRESTRICTED COINTEGRATION RANK TEST (TRACE) PROBABILITY

None	0.0736
At Most 1	0.3450

TABLE VIII: PESERAN TABLE I (1)%5

T Ratios With Deterministic Trend	-3.13	-3.63	-3.41	-3.95	-3.95	-3.96
T Ratios Without Deterministic Trend	-2.57	-3.21	-2.86	-3.53	-3.53	-3.43

According to correlation analysis, (Table IX), between the period of 1999-2011, stock price volatility and Turkey's economic growth rates were strongly and negatively correlated. Stock market capitalization to GDP is highly correlated with Turkey's economic growth rates. Outstanding international private debt securities to GDP has medium level correlation with Turkey's economic growth rate. That parameter should be analyzed for future years. It can have high level correlation with Turkey's economic growth rate in the long term. Before 2002, it has been known that public institutions's debt level was very high. After 2002, it has been found that outstanding international private securities gained more importance especially for banking sector which gets loans from international markets loans such as syndication credits. Bank's net interest margin has medium level negative correlation with Turkey's economic growth rates. Between the period of 1999-2011, Boone indicator (competition index) has weak positive correlation with Turkey's GDP. Boone indicator can have medium level positive correlation with Turkey's economic growth in the long term.

TABLE IX: CORRELATION MATRIX GDP

Bank z score	0.29
Bank non-interest income to total income	0.59
Bank regulatory capital to risk weighted assets	0.03
Banks Return on Assets(% after tax)	0.70
Gross Domestic Product	1
Stock market capitalization to GDP	0.74
Bank capital to total asset	0.54
Stock price volatility	-0.91
Stock market total value trade to GDP	0.44
Bank net interest margin	-0.62
Outstanding international private debt securities	0.64

IV. CONCLUSION

For the period 1970-2011, domestic credit to private sector has significant negative impact on Turkey's economic growth. Financial system deposits/GDP has significant positive impact on Turkey's economic growth. Deposits banks' asset/GDP do not have negative adjustment effect on Turkey's economic growth.

The research result is inconsistent with [6]-[8]'s findings. They indicated that banks credit to private sector has a statistically positive significant impact on economic growth. Moreover, the research result is consistent with [5]'s findings.[5] indicated that private sector credits have negative and significant impact on economic growth of 14 members of Islamic conference between the period of 1990-2009. For the period of 1999-2011, stock price volatility and Turkey's economic growth rates have strong negative correlation. Stock market capitalization/GDP and Turkey's economic growth rates have strong positive correlation. Bank return on Assets (% after tax) rates has strong positive correlation with Turkey's economic growth rates. That research result is consistent with [5]'s findings. [5] indicated that banking system development had a significant impact on economic growth of 14 members of Islamic conference between 1990-2009. Moreover, the research result is consistent with [9]'s findings.[9] indicated that stock market volatility has negative impact on Nigeria's economic growth.

According to research results, it can be mentioned that international money flows develop financial system and lead to make financial system much stronger and contribute the economic growth of Turkey. Moreover, that circumstance can be deteriorated with business cycles. Although financial system deposits and banks assets growth has significant impact on Turkish economy, there can be problem in business cycles. Many international investors can withdraw their investment on Turkey's financial system industry. New reinsurance techniques have to be developed. Central bank of Turkey needs to have more sophisticated softwares and analysis laboratories in order to minimize systematic risk.

Central bank and policy making groups should not be politically separated. Moreover, it has been found that a domestic credit to private sector has negative impact on Turkey's economic growth. In order to solve that problem, private credits' interest rates should be diminished and banks board of directors should declare new innovative business loan and venture financing products. Moreover, state institutions should give more grants to private sector. Economy and Development ministry has to buy the shares of critical private manufacturing and services sector in order to control their business efficiency and taxation. One of the reason of banking private credit's inefficiency is Turkey's current account deficit. Private companies do not give importance to develop patents and new products. Many businesses use low value added goods and sell the final product to domestic market at higher price with private credits. In addition, many businesses do not produce high value added products. Many businesses use low and medium level intermediate products. That can create problems for companies in the long run. As an example, Turkish textile industry has lost power due to the global financial crisis and China's cost minimization techniques. Many textile companies lost their status and apply to court with huge amount of debts. In order to solve the problems, companies need to produce high value added products to produce more equity with respect to private credit accumulation. Moreover, some of the big businesses have wrong investment strategy. Although some of the big manufacturing companies develop fast at some interval, since one of their business investment unit has huge amount of loans, that circumstance can have serious repercussions on another business units and manufacturing company can apply to court for insolvency problem.

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Huseyin Cetin was born on April 12, 1986. He received his bachelor of management degree at Sabanci University, Turkey in January 2010, and his master of international business degree at Griffith University, Australia, in September 2010. He is currently enrolled in PhD. business administration programme at Okan University Social Science Institute, Turkey and he is working as a research assistant at Okan University Business Administration Department. Huseyin Cetin's research interests are finance and international economics and econometrics and entrepreneurship. He has published articles about banking and international economics. In addition, he attended to management, economics, mathematics conferences.