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ÇEŞME/İZMİR, 1-3 NOVEMBER 2012



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ULUSLARARASI EKONOMİ KONFERANSI
UEK-TEK 2012
ÇEŞME/İZMİR, 1-3 KASIM 2012

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Türkiye Ekonomi Kurumu olarak 1-3 Kasım'da UEK-TEK 2012'de sizi de aramızda görmekten sevinç duyacağız.

En iyi dileklerimizle.

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Chair: Sara G. CALVO (Columbia University)

Failure to Manage Turkish Public Debt Crisis 2000-2001: Has IMF Been Misled?
ÖZKAYA, Ata (Galatasaray University)

Fiscal Solvency and Currency Crises in Emerging Markets: The Short-Term Debt Flows Perspective
ERTUĞRUL, Ayse (Bahcesehir University)

The Effect of The Public Debt on The Financial System Transformation: A Case Study For Turkey
ALTAYLIGİL, Barış (İstanbul University)
AKKAY, Reşat Can (İstanbul University)

Who Issues Debt Securities in Emerging Countries?
NAGANO, Mamoru (Seikei University)

Title:

The effect of the dometic debt on the financial development: A case study for Turkey

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Abstract

The aim of the study is to investigate the relationship between domestic debt and financial development for the Turkish economy between 2002Q1-2012Q2. The previous panel data studies for developing countries suggest two main approaches. One view asserts a positive relationship between them while the other view asserts a negative relationship. Our results which are based on the time-series analysis support the second view which advocates the negative relationship between domestic indebtedness and financial development. On the other hand we criticize the generalization of the results provided by other studies. According to our view each country has different responses due to its own specific condition.

Key words: Domestic debt, financial development

JEL codes: H63, O11, C32

1. Introduction

Governments issue debt mainly because of two reasons. The first reason is about conducting monetary policy and the second is about the compensation of the government deficits. The public debt issuance is a powerful instrument to balance monetary expansion. In this manner the negative impact of the inflows of foreign currencies could be impeded through the placement of public debt. Foncerrada (2005, ss.251-252) In other words the excess money is taken out of the circulation which could cause otherwise demand pressure and price increases in the domestic markets. The other reason of the debt issuance is based on the imbalance of the government expenses and income. Especially developing countries face with this imbalance due to the serious problems about raising revenue. Low income level and large informal sector make it difficult to collect direct and indirect taxes which represent a large portion of the public income. Additionally governments loose a reliable resource through trade liberalization which leads huge losses of tax revenues from tariffs. Inflation tax which could be thought as one of the traditional source of government revenue has lost its popularity due to the diligence about the price stability since 1990's. Given these difficulties in tax collection and inefficiency in the tax base leads developing countries to finance their government expenditures through domestic and international borrowing. This solution raises some questions about the optimal public debt structure. In one sense international borrowing provides countries to access financial resources. On the other hand the volatility in the capital flows into and out of these countries combined with the short-term characteristics of the external debt cause financial crises because of the lack of the financial depth in most of these countries. Additionally for most of these countries the access to international credit market is limited. This vicious cycle usually ends and starts again with renewed borrowing at unfavorable terms. Hence many developing governments have reduced the share of the external debt in their total debt structure. The uncertainties and additional costs of external debt force these countries to rely on internal borrowing. While domestic financing reduces macroeconomic risks, the absorption of the domestic financial sources by the governments brings some questions like inefficient credits to private sector and poor financial development to the agenda.

The common feature of the financial system in developing countries can be described as underdeveloped bond and equity markets. This fact causes the domination of the banks as the major lenders to the government in developing countries. Ozkan et al. (2008, p.2) This dual-role of banks as major lender to government and to the private sector offers an insight into a

new literature which investigates the impact of the domestic debt on the financial development especially in developing countries.

Kumhof and Tanner (2005), one of the pioneers of this literature, asserts that liquid collateral function of safe government debt facilitates financial intermediation. They put emphasis on the function of public debt in financial development as safest asset in the financial system. According to their "safe asset" view government debt provides a benchmark that facilitates the development of the private sector bond market which is very important for overall financial development. They also assert that stable government debt management may facilitate bank-based financial intermediation if legal system and institutional infrastructure is weak. They describe stable government debt markets as the backbone for further development of financial markets.

David Hauner (2006) in contrast focuses on the increasing share of the bank credit absorbed by the public sector which causes the risk of slowing financial development. He finds empirical evidence about the negative effect of the huge public debt on the financial deepening. He also finds that the increasing share of public sector credit is not related to the income level of the country. According to his findings it is associated mainly with slower growth, increasing government intervention, more government bank ownership and weaker creditor rights. In another work Hauner (2009) adds a new concept to his previous work and set a new approach called "lazy bank" view. According to this view banks raise their profitability through holding huge amount of public debt but there is a decrease in their efficiency and as a result financial deepening diminishes over time. The "lazy bank" view is also supported by the empirical results of the analysis. On the other hand there is also positive evidence for "safe asset" view up to a threshold in both bank-level and country-level regression analysis. Beyond this threshold the increasing level of public debt may become harmful. He summarizes the additional costs of large fiscal deficits in developing countries under four titles as important policy implications. First, financial depth and credit to private sector has strong impact on economic growth; second the decrease in private sector credits has negative effect on the small firms and income distribution; third underdeveloped financial sector raise the sensitivity of financial system to capital account crises; fourth, poor financial development supports financial crowding-out.

Emran and Farazi (2008) investigate the impact of the government borrowing from the domestic banking sector on the credit to private sector in developing countries based on the 25 developing countries. The results indicates a significant crowding-out effect of government borrowing on the private credits provided by banks. They find an increase of the government borrowing by one dollar reduces credit to the private sector up to 80 cents in the long-run. Emran and Farazi (2009) replicate their previous work and investigate crowding out effect for 60 developing countries. Their findings indicate more drastic results. They show empirically that $1.00 more government borrowing reduces private credit by about $1.40. According to their view crowding out of bank credit may have significant adverse effects on private investment and throughout on economic growth in developing countries where capital markets are not well developed. Their analysis support “lazy bank” view too.

Riccardo de Bonis (2010) studies the determinants of the size of bank loans and investigates the role of the government debt on it. The results of his analysis indicate two determinants which affect the credit size. First, government debt reduces the size of the credits to private sector because banks find investing in government bonds more attractive. Second, the low private credit ratio to GDP may correspond to a large weight of the government and connected state-owned enterprises in the economy.

Natia Kutivadze (2011) investigates also the relation between public debt and financial development and finds positive correlation between the development of the domestic debt market and financial development. The results of the analysis provide strong evidence which supports the key role of the financial development on the development of the domestic debt market.

Our main aim is to suggest a new way to investigate the relation between public debt and financial development. This suggestion is based mainly on our criticism about the method of the previous works. The empirical parts of the previous works are based on the panel data analysis with huge data sets but the results of their analysis suggest a general result for all countries. This common result represents the average response of the financial development against the changes in the public debt ratio but it hinders different responses of different countries about the same changes. We think that overall results will be only sound under the assumption of indifferences in the financial and economic conditions which is unreliable.

Therefore we suggest time series analysis for each country separately in order to analyze the effect of the public debt on the financial development.

The remainder of this paper is organized as follows: Section 2 represents an overview about the internal and external debt position of the Turkish economy historically. In Section 3 we present our variables. Section 4 provides regression results and Section 5 provides conclusion.

2. External and Internal Debt of the Turkish Economy

According to our view country specific differences play an important role in providing sound results about the analysis. Therefore we find it crucial to observe the Turkish public debt structure over time.

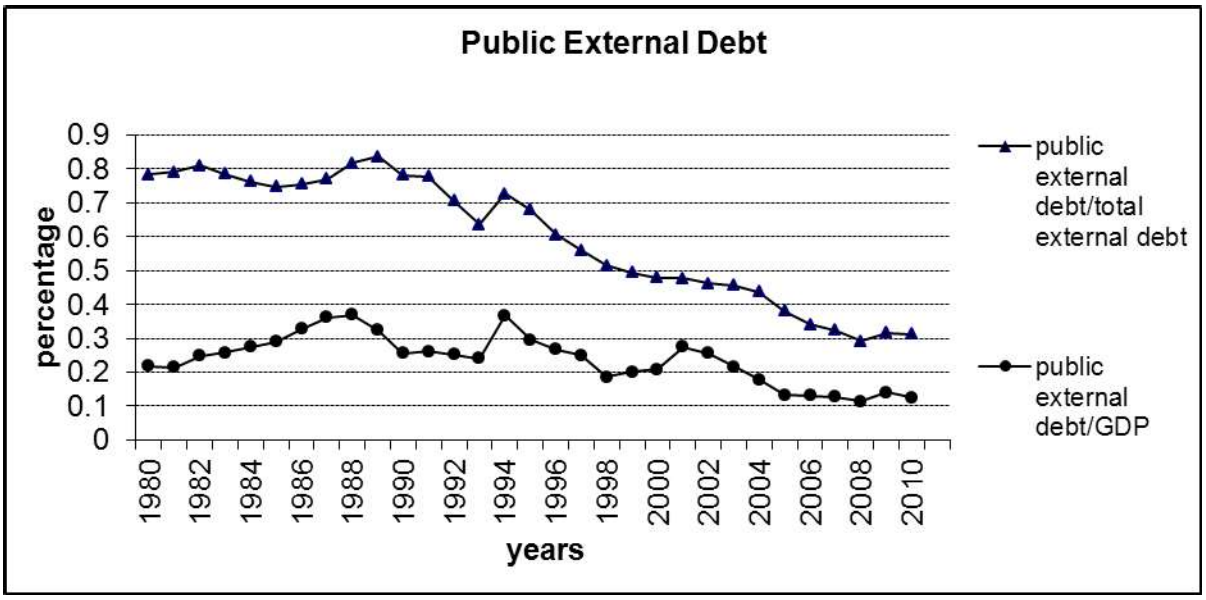


Figure 1Public External Debt (Source: World Bank)

Figure 1 represents the decrease in the *external public debt/GDP* and *external public debt/total external debt* ratio over time. The decrease in the share of the public debt in external borrowing means on the other hand an increase in the external private borrowing. In Figure 2 it can be seen that there is a trend shift in the *domestic debt/GDP* ratio after 2001. The increase in the public domestic borrowing from % 17 to % 43 between the years 2000-2002 and the descending trend of the public external borrowing supports the claim about the reliance of developing countries on internal borrowing because of the uncertainties and additional costs of external debt as we mentioned in the "Introduction" part of our study. On

the other hand the *domestic debt/GDP* ratio indicates a descending trend after 2002 up to % 27 percent in 2012.

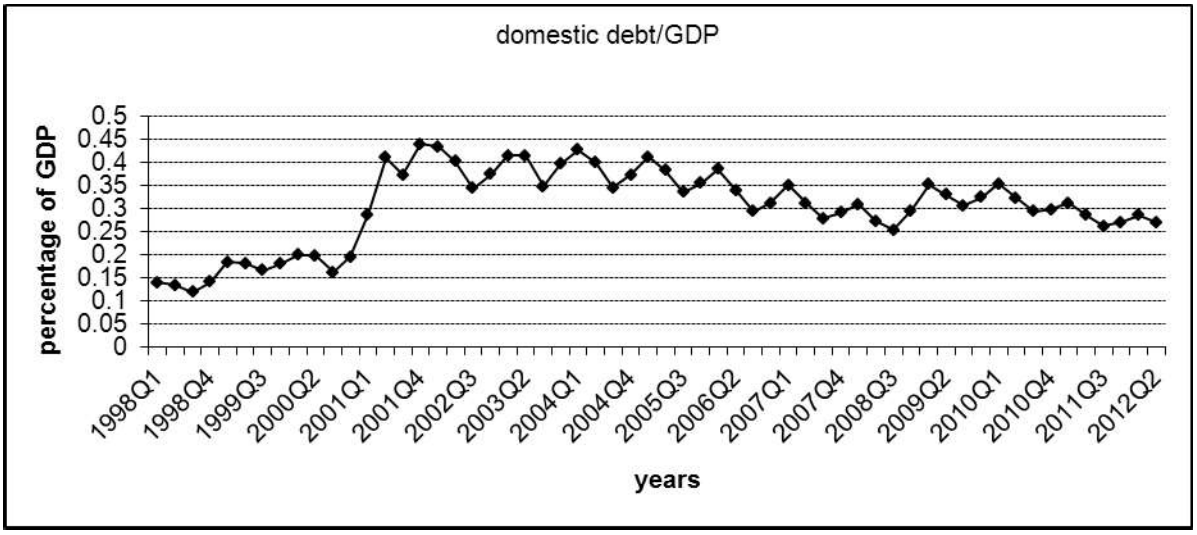


Figure 2 Domestic Debt over GDP (Source: CBRT)

The policy choice about relying on domestic sources instead of external borrowing may have some effect on the financial system. In the Turkish case banks play the dominant role in channeling funds from savers to investors like in many others developing and emerging market countries. Therefore the response of the banks due to the changes in the domestic borrowing is an important outcome to evaluate financial development in these countries. In Figure 3 and 4 this response of the Turkish banking sector can be seen very clearly. In Figure 3 the *bank credits to private sector/GDP* ratio indicates a tremendous increase after 2002. On the other hand in the same period the *bank credits to public sector/GDP* shows a decreasing trend. The percentage of the government securities held by banks in total government securities and the weight of these securities in total bank assets is a good indicator to evaluate the "laziness" of the banking sector. In Figure 4 both *government securities held by banks/ domestic debt* and *government securities held by banks/banks total asset* ratios indicate a decreasing trend after 2002. This trend has been corrupted during the financial crisis in 2008 but it converges very rapidly to its trend before 2008.

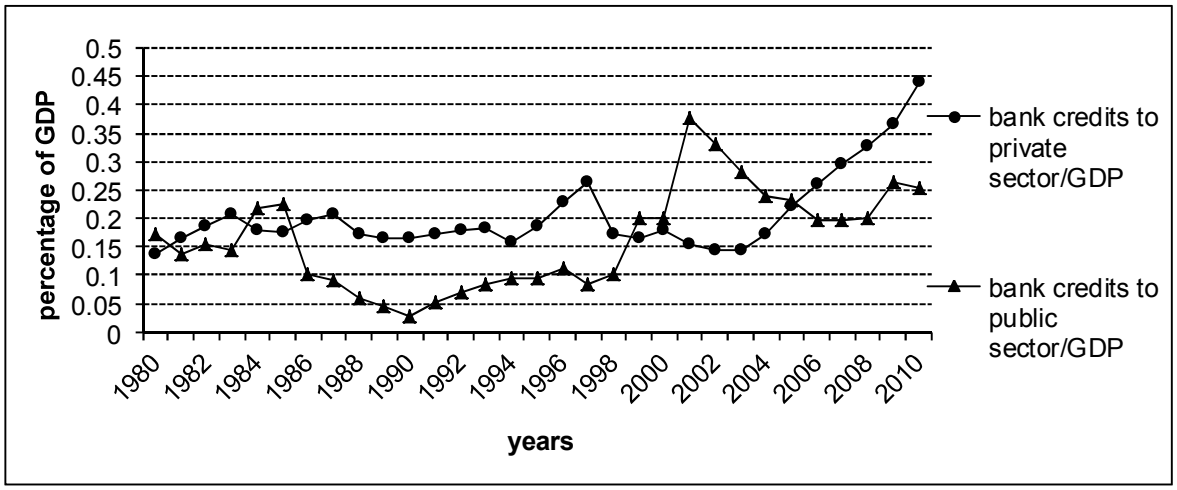


Figure 3 Bank Credits to Public and Private Sector (Source: World Bank)

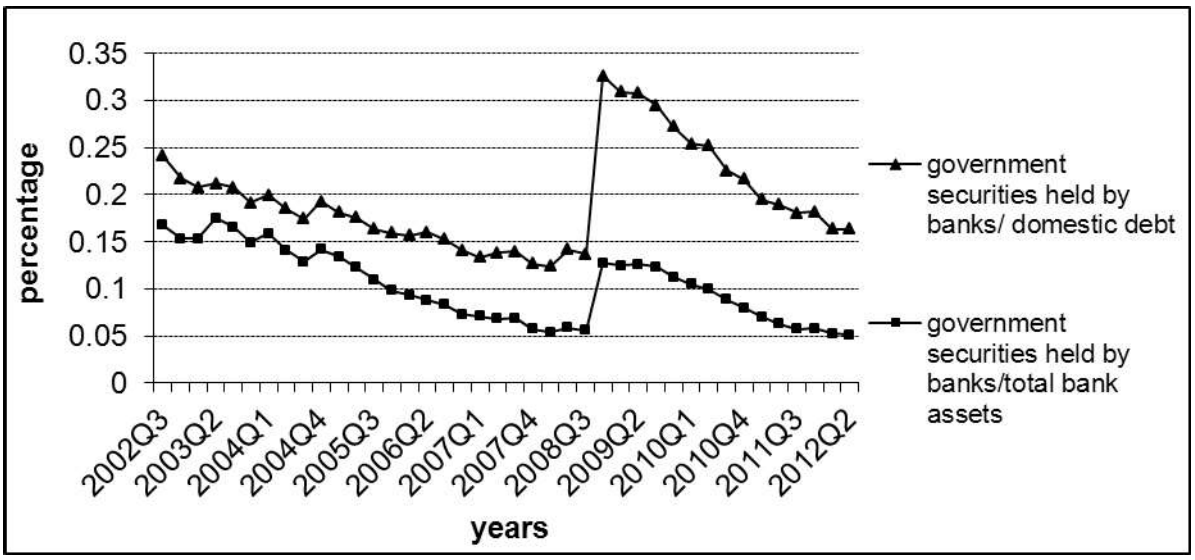


Figure 4 Government Securities held by banks (Source: CBRT)

In sum the share of the government domestic and external debt decreases as percentage of GDP between the years 2002-2012. The government policy during this period can be summarized as decreasing total public debt as the proportion of the GDP. Additionally it is aimed to decrease the amount of external debt as much as possible in order to minimize financial risks that could be faced during financial crises. The effect of this policy implication can be seen through monitoring the performance of the banking sector. The decreasing trend of the public debt/GDP ratio allows banking sector to give more credits to the private sector which has a positive impact on the economic growth.

3. Data and Methodology

To examine the relationship between public debt and financial development between the years 2002-2012 we need basically two measures. One measure should be an indicator which shows the financial development through time and the other should be an indicator which represents the indebtedness of public sector. The financial development measures are taken from the inspired work of Levine (2002). He constructed a component measure which indicates the degree of financial systems' ability to provide financial services. The measure consists of three sub-indicators. The first indicator is FINANCE-ACTIVITY which equals the logarithm of the *value traded ratio* times *private credit ratio*. The *value traded ratio* shows the activity of the stock market and *private credit ratio* shows the activity of the financial intermediaries. The second indicator is FINANCE-SIZE which equals the logarithm of the *market capitalization ratio* times *private credit ratio.* The market capitalization ratio shows the size of the stock market. The third measure of the financial development is FINANCE-EFFICIENCY which equals the logarithm of the *turnover ratio* divided by *interest rate margin.* The *turnover ratio* indicates how often shares change hands in a stock market and equals to the division of the value of stock transactions by the market capitalization. In most of the developed financial markets the *turnover ratios* are quite high. The *interest rate margin* represents the transaction cost of financial intermediation and equals the difference between borrowing and lending interest rates that banks face. The value of the margin may be interpreted differently under different assumptions. Under the assumption of liberalized financial systems higher values of the *interest rate margin* may be interpreted as poor competition in the banking sector and poor financial development. Under the assumption of financial repression the margin could be below its competitive level and higher values may have positive effect on the financial development (Hauner: 2006). The last measure which can be described as a summary measure is called FINANCE-AGGREGATE. This measure is the first principal component of the finance-activity, finance-size and finance-efficiency. Larger values of these four measures signify an increase in financial development.

Table 1 Financial Development Time Series[1]

TIME	FINACT	FINSIZE	FINEFF	FINAGG
2002Q1	-2.1466	-1.1938	N.A.	N.A.
2002Q2	-2.3232	-1.3994	0.4945	-2.2344
2002Q3	-2.4169	-1.5723	0.3047	-2.4816
2002Q4	-2.0249	-1.5828	0.2815	-2.2402
2003Q1	-2.7293	-1.6731	-0.2698	-2.9763
2003Q2	-2.0638	-1.5331	-0.5165	-2.5457
2003Q3	-2.1679	-1.5297	0.0246	-2.4003
2003Q4	-1.6116	-1.2587	0.5002	-1.6743
2004Q1	-1.7512	-1.1860	-0.2350	-2.0065
2004Q2	-1.6995	-0.9905	-0.0685	-1.7813
2004Q3	-1.5862	-0.8682	-0.0964	-1.6389
2004Q4	-1.6531	-0.8312	-0.5242	-1.8262
2005Q1	-1.4330	-0.6797	0.6238	-1.1351
2005Q2	-1.5302	-0.5962	-0.0810	-1.4207
2005Q3	-1.1750	-0.3721	0.2692	-0.9060
2005Q4	-1.1430	-0.2126	0.3760	-0.7403
2006Q1	-0.9508	0.0518	-0.0601	-0.6140
2006Q2	-0.7969	0.0076	0.6292	-0.2721
2006Q3	-1.2261	-0.0860	-1.5963	-1.4843
2006Q4	-1.2125	-0.0290	0.0116	-0.8099
2007Q1	-1.0784	0.0506	0.3248	-0.5480
2007Q2	-0.9141	0.2340	0.6069	-0.2116
2007Q3	-0.6623	0.3293	1.7518	0.4628
2007Q4	-0.7429	0.4218	-0.3669	-0.3588
2008Q1	-0.9421	0.1526	-0.9943	-0.9085
2008Q2	-1.0147	0.1311	0.1011	-0.5418
2008Q3	-0.9332	0.1986	-0.5823	-0.7119
2008Q4	-0.9522	-0.0955	0.5885	-0.4564
2009Q1	-1.0963	-0.0577	2.9586	0.4000
2009Q2	-0.3811	0.1650	0.8330	0.1820
2009Q3	-0.4207	0.3455	0.1489	0.0052
2009Q4	-0.3534	0.4069	0.8349	0.3571
2010Q1	-0.2748	0.5851	6.5800	2.7699
2010Q2	-0.2775	0.6352	-0.5883	-0.0022
2010Q3	-0.4423	0.7433	-0.5944	-0.0430
2010Q4	-0.0252	0.8666	1.0035	0.9351
2011Q1	-0.0004	0.8265	1.5309	1.1317
2011Q2	-0.0665	0.8643	6.3869	3.0113
2011Q3	-0.1967	0.7634	3.6655	1.7968
2011Q4	-0.3723	0.7199	-0.4954	0.0265
2012Q1	-0.3354	0.7839	0.1022	0.3257
2012Q2	-0.2607	0.7735	0.3191	0.4529

[1] Finance-Activity = Ln (total value traded ratio $*$ private credit ratio). Finance-Size = Ln(market capitalization ratio $*$ private credit ratio). Finance-Efficiency = Ln (total value traded ratio/overhead costs). Finance-Aggregate = Principal component of Finance Activity, Finance Size and Finance Efficiency.

As expected FINAGG gives nearly the same information those old variables FINACT, FINSIZE and FINEFF give. They are very strongly correlated variables.

Table 2 Correlations of Financial Structure and Financial Development

Correlation t-Statistic	FINACT	FINSIZE	FINEFF	FINAGG
FINACT	1.0000			
FINSIZE	0.9680 (24.118)**	1.0000		
FINEFF	0.3845 (2.6012)**	0.324535 (2.1426)*	1.0000	
FINAGG	0.9036 (13.1764)**	0.8764 (11.3681)**	0.7330 (6.7298)**	1.0000

**Indicates significance at the 0.01 level and * indicates significance at the 0.05 level.

The other component of our analysis is domestic debt. In the public debt-finance literature different indicators are used in order to represent the impact of the public debt on the financial development. *Public debt/GDP, domestic debt/GDP, external public debt/GDP, credit to public sector/total bank credit, credit to private sector/ credit to public sector* are examples for these indicators. In our analysis we use the logarithm of the DOMESTIC DEBT/GDP which represents the percentage change in the public needs of funds provided by the domestic financial system. We also used the logarithm of some control variables like INFLATION (-), TURNOVER RATIO (+) and INTEREST RATE MARGIN (+) with expected signs in the parentheses.[2]

4. Regression Results

To investigate the effects of public debt on financial development a regression analysis is established between public depth and FINAGG which was the principal component score of the financial indicators. Also some control variables added as explanatory variables to the regression analysis to show the direction of economic mechanism as accepted. Especially the true economic signs of the explanatory control variables were thought as a checksum of the

[2] The variables which are written with capital letters are used in the regression analysis.

regression analysis between public debt and FINAGG. The explanatory control variables of the regression analysis are decided as *Domestic debt/GDP, Turnover Ratio, Interest Rate Margin and Inflation.* The regression analysis is run for the Turkish monthly data for the period 2002:Q1- 2012:Q2. This period is selected because it includes the recovery phase after the 2001 crises in financial markets. Estimations covering more than ten years are considered sufficient in literature to make long-run interpretations and using quarterly data allows us to make 42 observations with lags. All data is obtained from the database of the Central Bank of Republic of Turkey. The Data at quarterly frequencies exhibit cyclical movements that recur every quarter. So recent U.S. Census Bureau's X12 seasonal adjustment method used for removing these cyclical seasonal movements from series.

The functional form of our regression analysis is chosen as a linear model as shown in the below;

$$FINAGG_t = \beta_1 + \beta_2 DDR_t + \beta_3 TOR_t + \beta_4 NIM_t + \beta_5 INF_t + u_t$$

Subjecting our variables individually to unit root analysis, we found that they are integrated of different orders. Such as FINAGG and INFLATION both have the same I(0) order which indicates stationary. But the rest of variables' order is I(1) which means they contain a unit root. The results are given in Table 3.

Table 3. DF and ADF Unit Root Tests for Stationarity

		DF		**ADF**		
Variable	Level/First Dif.	Intercept	Intercept& Trend	Intercept	Intercept& Trend	Conclusion
FINAGRR	Level	-1,730	-1.944	-3.592	-1.828	
		(-2.674)	(-3.77)	(-3.769)	(-4.532)	
	First Diff.	-3.996	-5.264	-2.854	-5.30	I (0)
		(-2.679)	(-3.77)	(-2.66)**	(-4.467)	
DDR	Level	-2.607	-3.400	2.684	3.163	
		(-2.674)	(-3.770)	(-3.769)	(-4.440)	
	First Diff.	-4.723	-4.917	-4.733	-4.655	I (1)
		(-2.679)	(-3.77)	(-3.788)	(-4.467)	
TOR	Level	-3.629	-3.696	-4.104	-3.937	
		(-2.692)	(-3.770)	(-3.831)	(-4.532)	
	First Diff.	-3.347	(3.301)	-3.256	-3.060	I (1)
		(-2.679)	(-3.190)*	(-3.052)*	(-4.616)	
NIM	Level	-0.913	-4.0604	-1.016	-3.842	
		(-2.674)	(-3.77)	(-3.769)	(-4.440)	
	First Diff.	-5.519	-5.113	-5.519	-5.301	I (1)
		(-2.685)	(-3.77)	(-3.808)	(-4.498)	
INF	Level	-0.913	-4.0604	-1.016	-3.842	
		(-2.674)	(-3.77)	(-3.769)	(-4.440)	
	First Diff.	-5.519	-5.113	-5.519	-5.301	I (0)
		(-2.685)	(-3.77)	(-3.808)	(-4.498)	

Notes: (i) Unit root test were performed using Eviews (Version7.0) (ii) Lag length: 0 (Automatic- based on SIC, maxlag=4) (iii) Figures in bracket indicate %99 critical values.(iv) Figures in bracket with (*) and (**) indicate % 95 and % 90 critical values respectively.

From Engle and Granger's definition cointegration refers to variables that are integrated of the same order. Nevertheless according to Lee and Granger (1990) it is possible to find equilibrium relationship among groups of variables that are integrated of different orders. As a result the linear combination of the variables cancels the stochastic trend in all series. Economically speaking, all the variables will be cointegrated if they have a long-term equilibrium between them. The estimated model is shown in below and the results are given in Table 4

.Table 4. Estimated Long Term Relation Model Dependent Variable: FINAGG

Regressors	Parameter Estimates	P-Value
INTERCEPT	4.5524	0.0144
DDR	-18.8046	0.0042
TOR	4.4268	0.0121
NIM	13.4483	0.0335
INF	-10.7644	0.1028
Adj. R^2 = 0.5933		
Prob (F-Statistic) = 0.0000		
Prob (L.M.) = 0.0329		

Note: Estimation with OLS and HAC Standard Errors

In the residuals of regression according to Breusch-Godfrey Serial Correlation LM test, autocorrelation is found. Newey-West method is used to get rid of autocorrelation and to obtain standard errors of OLS estimators that are corrected for autocorrelation (Gujarati, 2009:441).

The variables below are also cointegrated; that is, there is a long-term equilibrium relationship between them. In the short run there may be disequilibrium. Therefore, we can treat the error term in long term model as the "equilibrium error." And we can use this error term to tie the short-run behavior of FINAGRR to its long-run value. The short-run relation is formulated as error correction model (ECM) below. The estimated regression model and the results are shown in Table 5.

$$\Delta FINAGG_t = \alpha_1 + \alpha_2 \Delta DDR_t + \alpha_3 \Delta TOR_t + \alpha_4 \Delta NIM_t + \alpha_5 \Delta INF_t + \alpha_6 u_{t-1} + \varepsilon_t$$

Table 5. Estimated Error-Correction Model, Dependent Variable : Δ FINAGG

Regressors	Parameter Estimates	P-Value
INTERCEPT	0.0501	0.6986
ΔDDR	-3.2351	0.8190
ΔTOR	2.5875	0.0627
ΔNIM	10.3112	0.1288
ΔINF	-1.7851	0.7973
LONG-TERM RESİD (-1)	-0.5117	0.0022
Adj. R^2 = 0.3343		
Prob (F-Statistic) = 0.0113		
Prob (L.M.) = 0.7946		

Note: Estimation with OLS and HAC Standard Errors

Table (5) shows the short-run effect of public debt effect on financial improvement by using ECM model. In the short-run residuals follow the normal distribution and there is no autocorrelation as in the long-run. In this way the basic OLS estimation conditions are satisfied. As these results show, 0.51 of the discrepancy in the two ratios is eliminated. Because FINAGG ratio was higher than expected a priori in the last quarter, this quarter it will be reduced by 0.51 percentage points to restore the long-run relationship between the variables.

5. Conclusion

Our main aim is to provide some results about the relationship between public debt and financial development between the years 2002-2012 for Turkish economy. The literature that focuses on this relationship is quite new and based mainly on two opposite approaches called “safe asset” and “lazy bank” view. “Safe asset” view advocates the positive effect of the public indebtedness on the financial development while “lazy bank” view advocates the negative effect. We criticize previous works about the general results they provide. We assert that different countries will indicate different responses against the changes in the public indebtedness and these responses will also differ historically. Therefore we suggest a time-series analysis which provides to monitor country specific conditions through time. In order to

denote financial development we use the financial development indicators of Ross Levine (2002) and investigate its relationship with the domestic indebtedness. Our findings support our expectations based on the graphically interpretations of these two variables. The results indicate that the increase in the domestic indebtedness has negative effect on the financial development. The control variables also support our results.

The policy implication of the results indicate that decreasing level of domestic indebtedness allows Turkish banking sector to increase the credit rate to the private sector which in turns has positive effect on the economic growth. This result can be evaluated as a positive support to the "lazy bank" view. On the other hand we believe that the same analysis could give different results in another developing country which has different economic condition. Therefore we suggest country specific analysis in order to obtain sound results about the public debt-financial development relationship. In future works it may be a good way to classify countries under more specific constraints and work with small groups in order to reach more healthy results for specific groups of countries.

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