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The Relationship between Central Bank Activities and Price Stability: Case Study on the Central Bank of Turkey

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Abstract

Central banks aim to attain and maintain price stability by freely using a wide range of instruments. This concept, called central bank independence, comes with the caveat of accountability. In this study, we try to ascertain the relationship between central bank actions and price stability or inflation. However, in the literature there is only one objective scale available to evaluate central banking success, called Central Bank Financial Strength. In this study, Central Bank Financial Strength and all balance sheet components are scrutinized to show the relationship between them, using a case study of the Central Bank of the Republic of Turkey, supposed to be one of most successful central banks through the financial crisis of 2008-2011. The outcomes show that CBFS has no correlation with price stability; moreover there isn't any meaningful relationship between any other metric from balance sheet and the inflation rate.

Keywords: Central bank, Balance sheet, Inflation.
JEL Classification: E58; E61; P24.

Contribution of Study
The paper's primary contribution is to find out that Central Bank activities, materialized in balance sheet of Central Bank of Turkey, have no direct effect on inflation rate.

1. Introduction

In today's market, some of the most important economic actors are central banks, whose main strategic objective is to maintain price stability. Before describing the terms of central banking and price stability, we should clarify that these terms will be investigated in a historical manner rather than in terms of today's generally accepted usage. Today's economic theory and tools are overcomplicated, preventing even an expert from fully understanding the terms and relationships of active tools in economic and financial systems (Niall and Schularick, 2007; Wade, 2008). A historical exploration will clarify the roots without obscuring the focus area (Solow, 1985).

1.1. Price Stability

Central banking and price stability are almost inseparable concepts, even though price stability dates back much further, almost to the advent of coin money. Coins of gold, then silver, and combinations of the two emerged from the need for a common medium of exchange. Gold coins were first used around 700 BC in Ionia (in todays western Turkey) by Lydians, who have been claimed to be the inventors of money with the issuance of a standardized coin (Gardner, 1893). The counterfeiting of coin money and occasionally the devaluation of coins by decreasing the quantity of valuable metals in minted coins, resulted in inflation. Interestingly, todays paradigm is not much different since the main source of inflation in ancient times was the ruling authority who decided the ingredient ratio for coins, and who today has the right to issue banknotes and decide on interest rates.

There are many reasons behind progress from barter to coin, coin to banknote, and banknote to electronic money; however, inflation has always existed regardless of the medium people use. If we fast-forward to today and review current literature on price stability, research has always focused on actual financial tools and the economic environment, and has been, as a result, lost in technical details and the main reason for the deteriorating value of money is overlooked (Wade, 2008); (Solow, 1985).

1.2. Central Banking

As eminent modern economists Adam Smith, Knapp, and Keynes agree, money is a creature of the state. Historically, ruling authorities hold the right to control the medium of exchange. Yet since the first central bank was established in 1668 by Swedish Riksbank

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(Fregert and Jonung, 1996) the right to regulate money has been delegated to central banks. Furthermore, the power of central banks over monetary systems has steadily increased day to day. Central banks have never been more powerful than today (Braun, 2015). In almost every country, the monetary policy of an independent central bank is the main tool used to stabilize the macro-economy (Blinder, 1998).

Until recently, in the era of Great Moderation, the ultimate aim of the central bank was to maintain credibility for low inflation (Humpage, 2015). The 2008 crisis introduced the term financial stability into the mandate of central banks. However, the uppermost goal of all central banks is still to achieve price stability, or in other terms, low inflation.

In central banking theory, the top three principles required to achieve price stability are as follows:

- Independence
- Accountability
- Transparency

Central banks should be free from any political pressure to maintain price stability, and can use any tool or technique to reach this aim. Additionally, central banks should maintain transparency of operations within the monetary system, and should be accountable for their actions.

Though the transparency principle is widely accepted, not only are the books on economics in relation to central banking abstruse, but also the spine of central banking is still kept as a black box. Through our strategic investigation of central banking theory and its practice, specifically in the CBRT (Central Bank of the Republic of Turkey), secrecy is a great concern, quantitative analysis of actions is no where to be found. The actions of the central banks and how those actions affect people's lives are far from comprehensible for ordinary citizens.

The only quantitative metric at hand is the balance sheet, which can be used with the principles of transparency and accountability.

2. Central Bank Balance Sheet

Central banks have many different tools to achieve low inflation. Whatever tool or technique a central bank uses, it has a corresponding value in the organization's balance sheet (Chadha *et al.*, 2012). Detailed reasons why balance sheets should be targeted in research, especially for quantitative approaches, are common in the literature (Dalton and Dziobek, 2005); (Klueh and Stella, 2008); (Markiewicz, 2001). Any external shock or drastic policy change has a direct impact on the monetary authority's balance sheet (Klueh and Stella, 2008) the balance sheet shows these effects, especially in periods of crisis (Caruana, 2012). It is very common that central banking economists directly define monetary policies through balance sheet terminology (Caruana, 2013). Even more, international fiscal institutions providing loans or relief funds, such as IMF Standby (Bennett *et al.*, 1995) or ECB loans (Ertan *et al.*, 2015), require the corresponding country's central bank balance sheet to be submitted as a part of the agreement.

3. Central Bank Success

As part of our main study, Goal-DAG (Meral *et al.*, 2014) a strategy validation and verification framework, was applied to CBRT. During this process, strategy documents of the organization were investigated and a strategy map (Kaplan and Norton, 2004) was constructed to facilitate the Goal-DAG model. Goal-DAG would provide us a quantitative structure of organizational activities and their contributions to upper-level goals (Gungor and Oguztuzun, 2014).

Unfortunately, it is almost impossible to find an objective assessment of whether a central bank is successful or not. There is only one main study that presents an objective evaluation of the effect of central bank activities on price stability (Klueh and Stella, 2008) based on CBFS (Central Bank Financial Strength), which utilized balance sheet values, a direct reflection of central banking activities. This study started with evaluating the CBFS of the CBRT, one the best performing central banks during the 2008-2011 financial crisis. The approach included all balance sheet measures to discover correlations between central bank activities and inflation rate.

In short, any task to be accomplished has a direct effect on a central bank's financial state, which is represented in the balance sheet. So, the activities of a central bank can be followed by monitoring balance sheet fluctuations. Consequently, we targeted CBFS and its relation to inflation rate.

4. Analysis of CBRT

The actions of a central bank can largely be followed through its balance sheet, which includes the definitive quantitative data about monetary policy; the correlation between the mission and actions of the bank could be shown, as in CBFS to inflation rate. We apply CBFS on CBRT's balance sheet, since CBRT was one of the most successful monetary authorities during the 2008-2011 financial crisis. If there exists a correlation between

central bank actions and inflation rate, a simple correlation between balance sheet values and inflation rate should be shown.
Two analyses are undertaken:

- CBFS
- Direct Balance Sheet Metric

4.1. CBFS of CBRT & Inflation Rate

CBFS is the only objective measure available for central bank success. CBFS relies on balance sheet values, which supposedly have a negative correlation with policy performance (Klueh and Stella, 2008).
The CBFS approach consists of 4 phased calculations for use in regression analysis.

$CBFS_{1t} = (CBC_t + OIN_t) / TA_t$
$CBFS_{2t} = ROAA_t$
$CBFS_{3t} = CBINCOME_t / GDP_t$
$CBFS_{4t} = \sum CBINCOME_t / GDP_t$

We focus on $CBFS_{1t}$, since it is the most important latent variable from the balance sheet. The others are used for standardization and robustness of the results. Even more, ROAA values are not given in the balance sheet or any publicly available resource of CBRT.

Balance sheet values were obtained from EVDS[1] (Electronic Data Delivery System), which CBRT publishes daily. Inflation rate, on the other hand, is announced by TUIK (Turkish Statistics Institution) monthly. Daily balance sheet measures were averaged over a one month period to create a representative monthly digest. Inflation rate and CBFS measures calculated from the balance sheet were mapped to show their relationship over time.

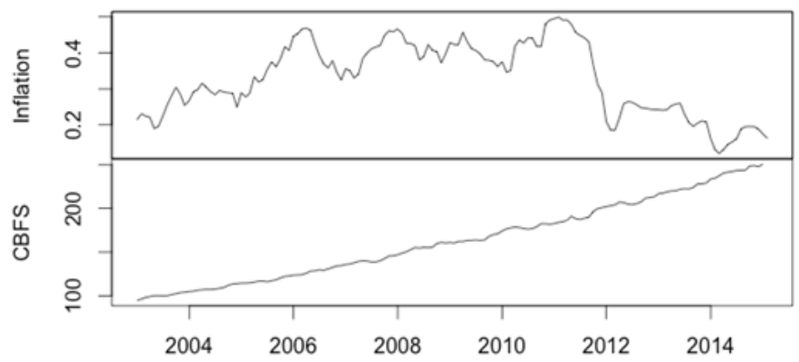

Figure-1. CBFS and Inflation Rate

Table-1. CBFS and its components, correlation with Inflation Rate data (Spearman)

	CBFS	INFLATION RATE	CBC	OIN	TA
CBFS	1.0000000	NA	0.9069956	-0.5680776	0.2317598
INFLATION RATE	NA	1	NA	NA	NA
CBC	0.9069956	NA	1.0000000	-0.4567793	0.5367260
OIN	-0.5680776	NA	-0.4567793	1.0000000	-0.2419085
TA	0.2317598	NA	0.5367260	-0.2419085	1.0000000

We are not able show any correlation between CBFS, or any component of the CBFS formula, with the inflation rate.

5. Balance Sheet & Inflation Rate

All balance sheet metrics from 2003 to 2015 are gathered and averaged monthly and mapped to inflation rate data. Correlation analysis shows almost no relation between any balance sheet element to the inflation rate. The following elements are the elements that show correlation with inflation rate over 0.3;

Table-2. Balance Sheet Elements cor > 0.3 (Spearman)

Balance Sheet Entry	Correlation with Inflation Rate
Gold (International Non-Standardized)	0.370434783
Other Foreign Money	0.301739130
Local Credit	0.301739130
Credit	0.301739130

[1] http://evds.tcmb.gov.tr : EDDS is a dynamic and interactive data dissemination system providing access via internet to the statistical data produced and/or compiled by the Central Bank of the Republic of Turkey. Access and usage of this system where the data are presented either in Turkish or in English in the form of reports, graphics and e-mail data do not necessitate any additional hardware or software.

6. Conclusion

A central bank's balance sheet reflects its financial state, which is directly influenced by the actions shaped by monetary board decisions and overall strategy. In this study, part of the Goal-DAG analysis, a quantitative framework to verify/validate organizational strategy and its actions, the statistical analyses show that the strategic implementations of the CBRT have had no effect on inflation rate. How do CBFS studies on Latin American and Caribbean countries show a relation between CBFS and inflation rate? It is agreed that a central bank's balance sheet reflects its actions. Instead of direct correlation analysis, the $CBFS_{1t}$ and its variant $CBFS_{2t}$, $CBFS_{3t}$ are used in conjunction, and even in elaboration, with qualitative data -independence, banking crisis, openness etc. It became very complex to build a regression based estimation model in which inflation rate is the dependent variable based on digest calculations of the balance sheet. We cannot conduct the same correlation analysis on those Latin American and Caribbean countries, but it is clear that data from Turkey does not establish a quantitative relation between inflation rate and the central bank, whose reason for existence is to maintain price stability. The initiation of this study is primarily to employ quantitative Goal-DAG framework to Central Bank, but unfortunately we are unable to find an objective link between Central Bank actions that are observed in balanced sheet and the ultimate aim of Central Bank, the price stability.

As a part of this study, we have also investigated the Research Department of the CBRT. The Research Department employs economists to develop policy for the CBRT. Research Department studies guide all CBRT actions through briefings to the Monetary Policy Board and the Governor. We are also unable to find any considerable correlation between inflation rate or inflation rate expectation and outputs of the Research Department.

As a result, we have dropped our study of strategic analysis of CBRT through Goal-DAG after 3 years of efforts including strategic-management-operational level analysis, aiming to structure a quantitative organizational model. There could be two interpretations of these results. One, that central banks have no considerable capability to influence inflation rate, or two, that we failed to find it. However, we cannot find anyone who can show any relation between central banking and inflation rate, despite the fact that central banking economists are probably the most well-funded researchers around the globe.

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References

Bennett, A., L. Dicks-Mireaux, M.A. Savastano, S.M. Carkovic, M. Mecagni, S. Schadler and J. John, 1995. IMF conditionality: Experience under stand-by and extended arrangements, part II: background papers. USA: International Monetary Fund.

Blinder, A.S., 1998. Foreword. In A. S. Blinder, central banking in theory and practice. Cambridge, Massachusetts: MIT Press. pp: IX-XII.

Braun, B., 2015. Two sides of the same coin? Financialization and central bank dominance in the Euro area. In 22nd International Conference of Europeanists. Ces.

Caruana, J., 2012. Why central bank balance sheets matter. Those of Australia, China, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand, 2.

Caruana, J., 2013. Central banking in a balance sheet recession. International Journal of Central Banking, 9(1): 367-372.

Chadha, J.S., L. Corrado and J. Meaning, 2012. Reserves, liquidity and money: An assessment of balance sheet policies. BIS Paper, (66t): 304-357. Available from http://www.bis.org/publ/bppdf/bispap66t.pdf [Accessed 2015-09-22].

Dalton, J. and C. Dziobek, 2005. Central bank losses and experiences in selected countries. IMF Working Paper 05/72. Washington: International Monetary Fund.

Ertan, A., M. Loumioti and R. Wittenberg-Moerman, 2015. Enhancing loan quality through transparency: Evidence from the European central bank loan level reporting initiative. August 2015, Preliminary and Incomplete Version. Cited by Permission of Ertan, A.

Fregert, K. and L. Jonung, 1996. Inflation and switches between specie and paper standards in Sweden 1668-1931: A public finance interpretation. Scottish Journal of Political Economy, 43(4): 444-467.

Gardner, P., 1893. The earliest coins of Greece proper, British Academy Proceedings, V(1):249. Available from http://archive.org/stream/earliestcoinsofg00garduoft/earliestcoinsofg00garduoft_djvu.txt [Accessed 2015-09-22].

Gungor, C. and H. Oguztuzun, 2014. GoalDAG - ArchiMate Integration. Information and Software Technologies - 20th International Conference, ICIST 2014, Druskininkai, Lithuania, October 9-10, 2014. Proceedings. Druskininkai. pp: 194-210.

Humpage, O., 2015. Current federal reserve policy under the lens of economic history: Essays to commemorate the federal reserve system's centennial. New York: Cambridge University Press.

Kaplan, R.S. and D.P. Norton, 2004. The strategy map: Guide to aligning intangible assets. Strategy & Leadership, 32(5): 10-17. DOI 10.1108/10878570410699825.

Klueh, U.H. and P. Stella, 2008. Central bank financial strength and policy performance: An econometric evaluation (No. 2008-2176). Washington: International Monetary Fund.

Markiewicz, M., 2001. Quasi-fiscal operations of central banks in transition economies. BOFIT Discussion Paper No. 2/2001.

Meral, B., C. Güngör and H. Oguztüzün, 2014. Is sureclerinin Hedef Tabanli Modellenmesi icin bir Arac. Proceedings of the 8th Turkish National Software Engineering Symposium, Guzelyurt, KKTC, Turkey, September 8-10, 2014. Guzelyurt. pp: 269-280.

Niall, F. and M. Schularick, 2007. Chimerica and the global asset market boom. International Finance, 10(3): 1468-2362. DOI 10.1111/j.1468-2362.2007.00210.x.

Solow, R.M., 1985. Economic history and economics. Papers and Proceedings of the Ninety-Seventh Annual Meeting of the American Economic Association, 75(2): 328-331.
Wade, R., 2008. The first-world debt crisis of 2007-2010 in global perspective. Challenge, 51(4): 23-54.