

CENTRAL BANK INDEPENDENCE AND ECONOMIC PERFORMANCE IN CAUCASUS AND CENTRAL ASIAN COUNTRIES

Abdulkadir Nagac

Independent Researcher, Turkey

Islam Rizvanoglu

University of Houston, USA

ABSTRACT

This paper explores the association of both central bank independence (CBI) and financial market development with the economic performance of Turkey together with six former centrally planned former Soviet Union countries located in Caucasus and Central Asia (CCA countries). First, we construct a legal independence index (LVAW) for central banks. Then, we analyze the relationship between central bank independence and macroeconomic variables. Our findings suggest that there is a positive correlation between central bank independence and GDP growth, whereas the sign of correlation between CBI and GDP deflator is negative. Besides, the economies with higher level of financial deepening are also associated with high CBI.

Keywords: Central Bank Independence, CCA Countries, Economic Performance, LVAW Index.

DOI: <http://dx.doi.org/10.15549/jeecar.v5i2.234>

INTRODUCTION

After the fall of Soviet Union in 1990, new countries started to emerge in Central Asia and elsewhere. These newly created countries got into a process of transition from centrally planned economies to market economies. The transition involved varying degrees of stabilization, liberalization, restructuring and privatization. In former socialist countries where decades of central planning blocked development of market forces, the transition required extensive institutional building. One important element of this process was the creation of new central banks or upgrading the independence of preexisting central banks. After gaining their independence, most Caucasus and Central Asian countries experienced high inflation and fall in their GDPs. The experience

of these countries allows us to study the relationship between central bank independence and overall economic performance.

The concept of central bank independence generally refers to the degree of success of the central bank in resisting unjustified influences from government, industry and other interest. There is a substantial and growing literature on central bank independence as the best way to maintain price stability, which in turn is conducive to sustainable growth.

Central bank independence is an important part of the perception of modern central banking. Theoretical argument behind the central bank independence is that independent central banks have less incentive to inflate. According to Blinder (1998) monetary policy by

definition requires a long-time prospect and there are lags in its effects on output and inflation. Moreover, disinflation resembles investment: it costs are born today and return is received gradually in the long run. However, politicians, media, and the public are not patient and tolerant, nor do they have an idea about the lags problem in monetary policy. Central bank independence helps to escape making monetary policy dependent on short-term gains at the expense of the long-term failures. Granting independence to central bank is also viewed as the key solution to the time inconsistency problem of monetary policy, which is about central banks' incentive to deviate from long run inflation targets. To be more precise, after setting the long run inflation target and once nominal contracts are negotiated by wage and price setters, central bank may increase inflation to pull down unemployment level. However, rational agents will understand the incentives of policymakers and adjust prices and wages accordingly, neutralizing any effect of inflation on employment in the long run. Consequently, employment will remain at its natural level, but monetary policy will be subject to a suboptimal inflationary bias. Both Kydland and Prescott (1977) and Barro and Gordon (1983) point out that independence of the central bank is as part of the solution to the time-inconsistency problem. In other words, when isolated from political interference, the central bank is more credible and more successful in the pursuit of its ultimate goal of price stability. As these studies point out, independence of central banks are very crucial in achieving macroeconomic goals. In this paper, we analyze the effects of central bank independence (CBI) on macroeconomic variables such as inflation, GDP growth and financial deepening. We use rank correlation test to analyze the impact of improvement in CBI over time on macroeconomic variables. Panel data regression models would be more suitable method if we had enough number of data points. However, given that the number of observations is limited, we believe that correlation test will be more suitable for our study.

LITERATURE REVIEW

There are several types of central bank independence categorized according to different criteria. Cukierman (1992) classification is based on legal versus actual independence. Legal independence refers to the level of

independence as specified in the law. It measures the degree of independence that legislators meant to grant to the central bank. Actual independence, as the name suggests, depends on how the law is interpreted and implemented. Central banks may sometimes deviate from the degree of legal independence. Such deviations are more evident in developing economies than in developed ones. The classification by Grilli et al (1991) is based on political and economic independence. They define political independence as the ability of the central bank to choose the final goal of monetary policy, such as the rate of inflation or the level of economic activity, while economic independence is the capacity to choose the instruments to pursue those goals without interference from the government. Goal vs. instrument independence is another kind of central bank independence developed by DeBelle and Fischer (1994). Goal independence is the broadest degree of independence and authority for the central bank. Instrument independence is characterized by powers to define and employ independently the instruments for achieving externally set numerical target.

Several studies have analyzed the link between central bank independence and macroeconomic performance of transition economies. Cukierman et al. (2002) construct legal independence indices for new CBs in 26 former socialist economies and find that CBI is actually unrelated to inflation during the early stages of liberalization. Their data reveals that higher level of legal CBI is associated with lower level of inflation only for those countries with sufficiently high and sustained levels of liberalization. Therefore, according to Cukierman et al. (2002), legal independence of CBs may not be effective in reducing inflation without sustained market liberalization. Jacome and Vazquez (2005) study the relationship between CBI and inflation using a panel data for 24 countries in Latina America and Caribbean during the 1990s. Although they confirm a negative relationship between CBI, measured by LVAW, and inflation, they fail to establish any causality between these variables.

In a relatively more recent study, Crowe and Meade (2008) examines the level of CBI in a broad sample of industrial and emerging economies and find a robust negative relationship between legal independence of CB and inflation. On the other hand, Hielscher and

Markwardt (2012) examine a cross-section of up to 69 countries and argue that CBI, per se, may not be sufficient for a better inflation performance, as the quality of the political institutions also matter. For inflation to decline, a country should have well-developed political institutions and also experience a large shift in CBI. Using dynamic panel model for 1985-2005, Klomp and Haan (2009) state that CBI does not only help to achieve low level of inflation, but also to maintain financial stability. They also find the association between CBI and financial stability is mostly due to political independence, rather than economic independence.

In addition to central bank independence, financial market deepening (FMD) is also associated with anti-inflationary incentives. Neyapti (2002) examines the trends in economic performance in eight eastern European countries and the degree of central bank independence. She finds that both CBI and FMD show significant association with macroeconomic variables inflation and GDP growth. Goodman (1991) and Posen (1994) suggest that financial market deepening will yield politically powerful interest groups who want price stability. This is because inflation harms financial intermediaries that lend long term and borrow short term. Hence, as a developed financial market facilitates FMD by both establishing and maintaining independent central bank, central bank independence, in turn, facilitates FMD by forcing financial intermediaries to lend efficiently.

The purpose of this paper is to explore the association of both central bank independence and financial market development with the economic performance of Turkey together with six former centrally planned former Soviet Union countries located in Caucasus and Central Asia, namely, Georgia, Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan and Tajikistan. All these countries are former Soviet Union states except Turkey. A common characteristic of these newly independent countries is to establish independent central banks in 1990s. The variation in the level of central bank independence among these countries and the change in CBI by time allow us to analyze the effects of CBI. Although Turkey has never been a state of former Soviet Union, liberalization of financial markets happened in late 1980s. In Turkey, significant reforms have been made in banking industry in early 2000s as a result of financial crisis. Hence, we observe significant

variation in CBI in Turkey over the last 30 years. Thus, including Turkey to our data set will make our analysis more reliable as the number of observations increase. It might take a long time for CBI to have an effect on macroeconomic variables such as GDP growth or inflation. So, all the years from mid 90s (when former soviet union countries gained their independence) to 2013 are covered in this study. CBI of the countries changed during this time because of reforms. We are able to see the long run effects of CBI on macroeconomic variables by analyzing the change from mid 90s to 2011-2013. By following the method of Cukierman et al. (1992), we first develop a legal independence index for each country. Then, we provide a measure of financial market independence: M2 to GDP ratio, which is referred as financial deepening in the literature (Neyapti (2002)). Finally, we investigate the association of these CBI and FMD indices with some major macroeconomic indicator such as GDP growth and GDP deflator. Due to statistical imperfections in these newly independent countries, we assume that GDP deflator is a better measure of inflation compared to CPI or PPI.

Previous studies about the effect of CBI on macroeconomic variables use cross section data. However, it has been stated in literature that changes in CBI might have an effect on macroeconomic variables over long periods. So, having both cross section and time variation in data set will yield better results. Since we use panel data in this study (seven countries and 2 time periods), we believe that the data we use can pin down the effects of CBI on macroeconomic variables better compared to previous studies.

Our findings suggest that there is a positive correlation between central bank independence and GDP growth, whereas the sign of correlation between CBI and GDP deflator is negative. Besides, the economies with higher level of financial deepening are also associated with low inflation. Although we do not argue any causality in this study, it seems that enforcing CBI by adopting the proper laws increases the confidence in the financial markets and thus leads to higher FMD.

MEASURING CENTRAL BANK INDEPENDENCE

Although it is not straightforward to measure independence of any Central Bank, because of

its complex nature, some scholars have come up with different techniques that measure CBI from various aspects. In that regard, Bade and Parkin (1980)'s political independence, Grilli et al (1991)'s political and economic independence and lastly, Cukierman (1992)'s legal independence indices are among the first and most influential methods in quantifying central bank independence. According to Bade and Parkin (1980), political independence is measured by the ability of the central bank to implement its policies without any government intervention. Grilli et al. (1991) takes the idea of CB independence a step further and introduces the economic independence in addition to political independence. Their political independence sub-index includes nine items related to appointment procedures of the central bank's board members and the government, as well as formal responsibilities of the central bank. The economic independence sub-index includes seven items on central bank lending to the government and the nature of monetary instruments.

Cukierman (1992)'s legal independence index, on the other hand, takes into account different legal aspects of CB's operations and objectives, appointments of board members and governors and the resolution of the conflicts between monetary and fiscal authorities. Schwobdiauer, Komarov and Akimova (2006) analyze legal independence at three different levels. To be more precise, they disentangle legal independence into three categories: independence established by international treaty (European Central Bank), constitutional independence (Switzerland) and independence established by national legislation acts.

Although Cukierman's approach is considered to be the most comprehensive one, an index based on laws can be misleading in a sense that actual practice is may not be in compliance with the laws. In other words, a strong political power can easily bypass these laws to realize its own objectives rather than maximizing society's welfare. Therefore, in order to measure the level of actual independence of CBs, Cukierman (1992) also develops two indices, i.e. Questionnaire Variable Weighted (QVAW) and Questionnaire Variable Unweighted (QVAU), based on responses to a questionnaire sent out to a nonrandom sample of internal and external experts on monetary policy. This method allows the researcher to reveal the degree of de facto central bank independence, rather than de jure

independence captured by LVAW.

In this paper, we choose to employ the legal independence index (LVAW) constructed by Cukierman (1992), since it is the most comprehensive index among others. Additionally, the availability of the LVAW index values of the FSU countries and Turkey for 1990s allows us to see how the degree of CB independence evolved over time for these countries.

According to Cukierman (1992), the degree of legal CBI (LVAW) can be measured by detailed analysis of 16 different variables grouped into four major sets of items.

- 1) First major component of the legal independence is related to the appointment, term and dismissal of the governor and other board members of CB. In that regard, a longer office term will enable the monetary authority to take long-term measures that can hurt in the short-run without any fear from fiscal authority. On the other hand, a CB charter that allows the legislative or executive branch of the government to dismiss the government anytime at their disposal will substantially undermine the independence of CB and objectiveness of its policies.
- 2) The degree of freedom in formulation of monetary policy is the second important component of legal independence. CBs can be the sole decision maker in formulating the monetary policy or hold only advisory position to the government. Besides, government intervention in monetary policy matters, this component also includes the ability of CB to participate in the process of budget formulation.
- 3) Third component is related to the objectives of CB framed by laws. CBs usually target price stability in order to fight with inflationary expectations. However, during times of recession governments tends to push CBs in favor of expansionary policies that will definitely distort price stability in upward direction. Therefore, more independent CBs will pursue price stability goal without any obstacle even though it can have adverse effects on unemployment or economic growth.
- 4) Lastly, fourth component of the legal independence includes regulations on the lending to the government. As the only

issuer of the domestic currency, CBs are the main source for funding for any government. Even though CB is allowed to charge interest rate on loans to the government, without a proper regulation, governments can easily turn CBs into their “backyard” money-printing warehouse. In that regard, more independent banks will have specific limitations on the amount, maturity, type and price of loans to the government directly or through purchases of government securities.

Each component has been assigned a positive weight that adds up to one, in order to construct an overall index, namely Legal Variables Weighted (LVAW). The weights used for each component are 0.2, 0.15, 0.15 and 0.5, respectively. Each component of LVAW is also divided into several variables, which are also assigned a positive weight. Table 1A of the Appendix lists the 16 basic variables underlying the aggregate index LVAW and describes the conventions for their coding weights. Each variable is coded on a scale between 0 and 1 where 0 stands for the minimal level of independence. For example, according to the current CB charter of Azerbaijan, the CEO of CB, who is entitled to serve for 5 years (0.5 points), is appointed by the executive branch of the country (0.25 points) and can be dismissed on for non-policy (e.g. violation of law) (0.83 points). Lastly, the CEO of the CB of Azerbaijan is not allowed to hold another office in government (1 point). Based on this information and weights given on Table 1A, the first component of the LVAW index for Azerbaijan will be $0.5 \times 0.25 + 0.25 \times 0.25 + 0.83 \times 0.25 + 1 \times 0.25 = 0.645$, which composes 20% of the final LVAW index for this country.

DATA AND METHODOLOGY

The degree of CBI is mostly stable over time for any country, since the laws and regulations change only from time to time. Due to the absence of meaningful variation in the measure of CBI, most studies choose to perform cross-

sectional analysis on macroeconomic indicators and CBI. However, newly independent states of former Soviet Union have been an excellent venue for a time-series analysis. Although even these countries have not changed their laws every year, nevertheless, there have been few but dramatic changes over time since 1990. The lack of experience in central banking and absence of fully operational financial markets required CBs of these countries to evolve over time. Six FSU countries in our sample have adopted laws on CB in early 1990s and 2000s. In addition to these countries, Turkey has also introduced few changes in laws on CB. Although Turkey has always been a capitalist and open economy, liberalization of capital markets were observed only by late 1980s. As a result, substantial amount of capital inflows made financial system more fragile and vulnerable. However, capital market liberalization coped with inadequate institutions and regulations led to financial crisis in 1994 and 2001. Realizing the need for a structural reform, Turkish government introduced new laws that significantly changed the operations of banking sector and the role of CB.

The purpose of this paper is to study any potential association of CBI and FMD with macroeconomic indicators. More specifically, we wonder whether the enactment of new CB laws in our sample countries during last 30 years had any effect on inflation and economic growth. In order to answer to this question, we use both over time and cross-country variation in legal independence. For that purpose, we use the indices of legal independence for early 1990s calculated by Cukierman et al (1992) and Neyapti and Berument (1999) and measure the current value of those indices by looking directly at the charters of CBs for seven countries. Regarding macroeconomic indicators, we collect data on real GDP growth and GDP deflator for 1996-1998 and 2011-2013. Taking into account that current laws have already been in effect for last few years, in other words, none of these countries have recently changed their laws, macro data for 2011-2013 will be a good proxy for post-enactment period. We are using M2 to GDP ratio for the above-mentioned years as a proxy for financial deepening.

Table 1: LVAW, macroeconomic indicators and FMD values.

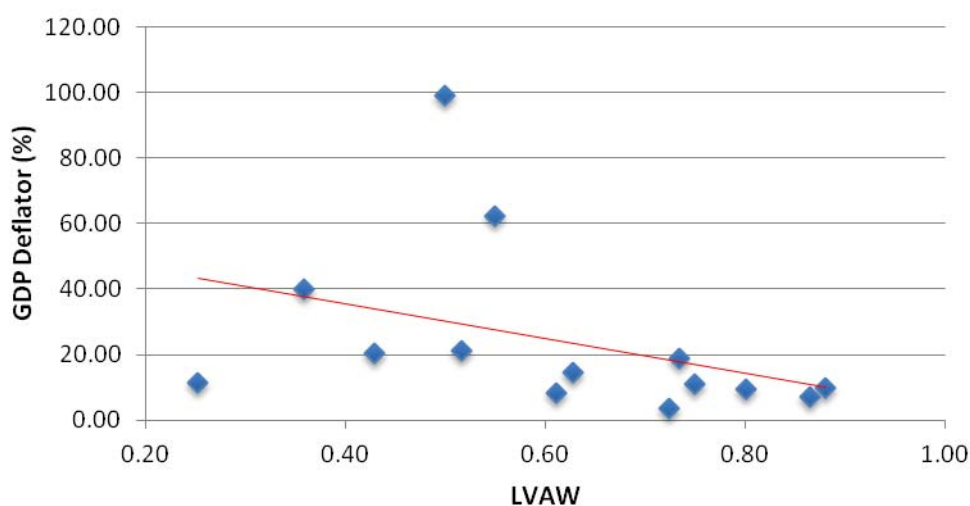
	LVAW		GDP growth rate (%)		GDP deflator (%)		M2/GDP	
	Current	Old	Current	Old	Current	Old	Current	Old
Azerbaijan	0.61	0.25	2.70	5.70	8.33	11.53	30.40	11.93
Georgia	0.72	0.74	5.47	8.27	3.43	18.80	28.70	7.50
Kazakhstan	0.80	0.43	6.17	0.10	9.50	20.23	34.70	9.60
Kyrgyzstan	0.75	0.52	5.47	6.37	11.07	21.23	32.40	13.63
Tajikistan	0.88	0.36	7.43	-3.23	9.83	39.97	20.10	7.10
Turkey	0.87	0.50	4.97	5.77	7.13	98.90	57.00	34.17
Uzbekistan	0.63	0.55	8.17	3.73	14.67	62.23	24.33	17.97

ANALYSIS

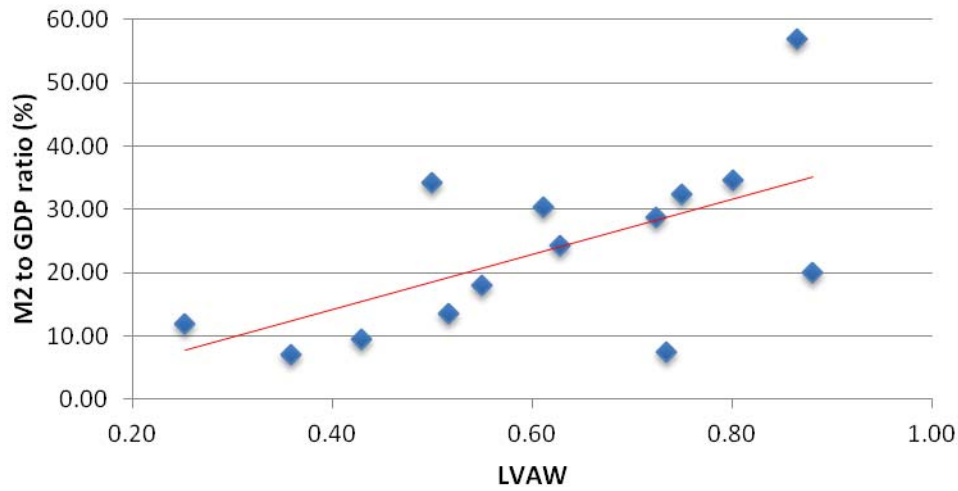
This section explores the association of CBI index and indices of three macroeconomic indicators: GDP deflator, Financial market deepening (M2/GDP) and GDP growth. As it is shown on Table 1, all the countries in our sample, except Georgia, have significantly improved the legal independence of their CBs. Georgia already had a very high CBI index in 1990s. So, there was not a significant room for improvement in central bank independence for Georgia. We also see in Table 1 that GDP deflator has decreased for all countries from 1990s to 2014. Our financial market deepening measure, M2 to GDP ratio, have improved significantly for all countries. Despite the sizeable increase over the years, current

monetization is still low with M2 to GDP at 28 percent on average (except Turkey). Low M2 to GDP ratio suggests a preference for cash transactions over transaction via the banking system. This may be due to political instability, low confidence in the banking system, and historic cultural preferences for holding cash.

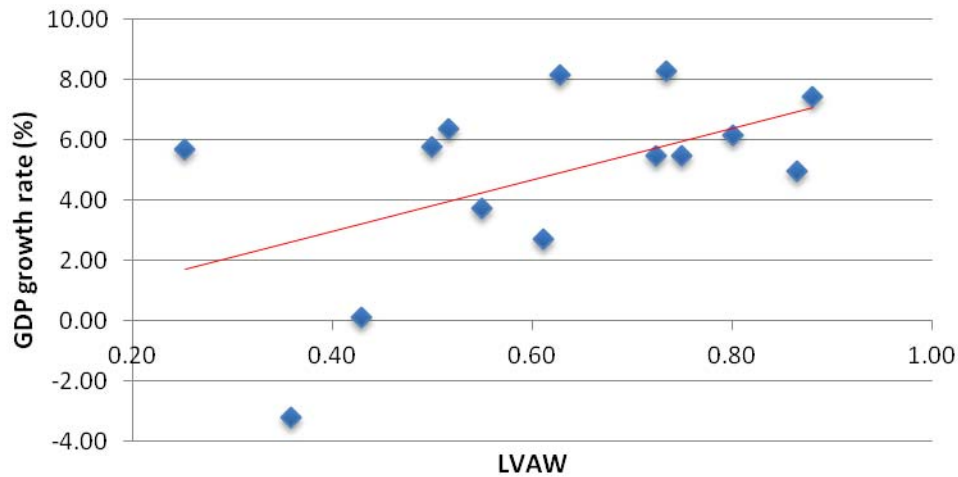
The change in GDP growth rate over time is ambiguous. It has increased for Kazakhstan, Uzbekistan and Tajikistan, while it has decreased for Azerbaijan, Georgia, Kyrgyzstan and Turkey. GDP growth can be affected by many variables, such as productivity and investment levels. Therefore, country specific variables play a significant role in GDP growth rate change from 1990s to 2014.



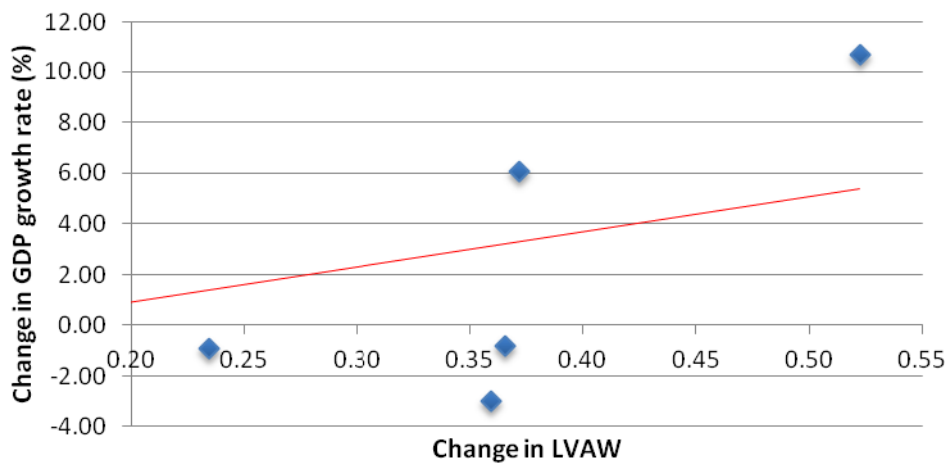
(a) GDP deflator vs LVAW



(b) M2/GDP vs LVAW



(c) GDP growth rate vs LVAW



(d) Δ GDP growth rate vs Δ LVAW

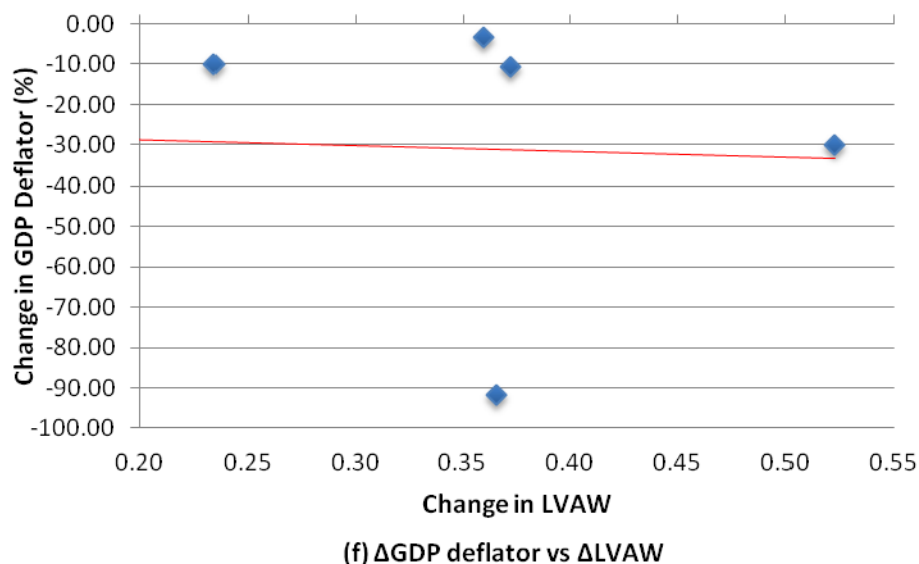
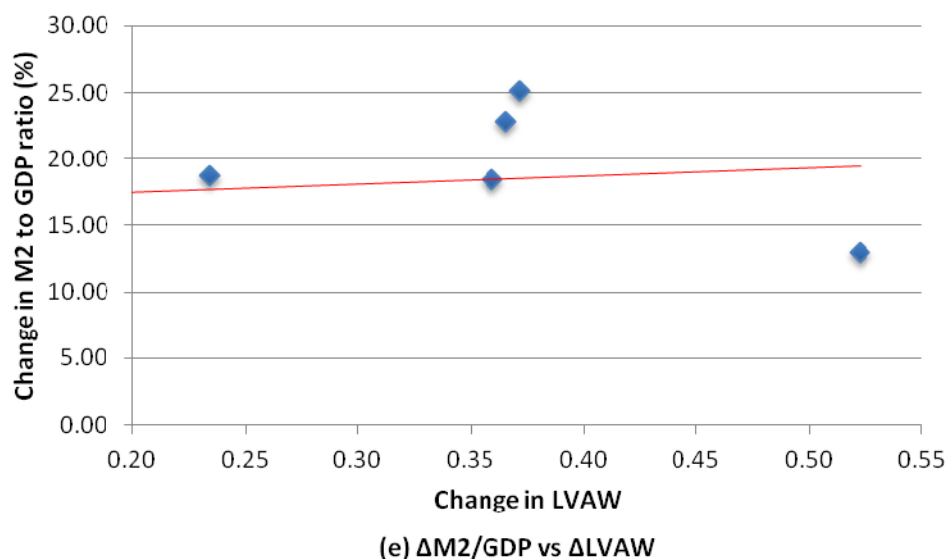


Figure 1: Pooled LVAW index and macro indicators.

Figure 1 plot pooled GDP deflator, GDP growth and M2 to GDP ratio against CBI index. Figure 1 (a) shows that as CBI index increases GDP

deflator tends to decrease. In Figure 1 (b) and (c), we see that GDP growth and M2 to GDP ratio are positively correlated with CBI index.

Table 2: Change in LVAW, macroeconomic indicators and FMD values over time.

	Change in LVAW	Change in GDP growth	Change in GDP deflator	Change in M2/GDP
Azerbaijan	0.36	-3.00	-3.20	18.47
Georgia	-0.01	-2.80	-15.37	21.20
Kazakhstan	0.37	6.07	-10.73	25.10
Kyrgyzstan	0.23	-0.90	-10.17	18.77
Tajikistan	0.52	10.67	-30.13	13.00
Turkey	0.37	-0.80	-91.77	22.83
Uzbekistan	0.08	4.43	-47.57	6.37

Table 2 presents differences of variables between 2014 and 1990s. The difference analysis helps us eliminate country specific fixed effects. By subtracting 1990s value from 2014 value for each variable, we can clearly see how the trend in CBI index and trend in other variables are related. In Table 2, we see that whenever CBI increases for a country, GDP deflator decreases, except for Georgia. As explained before, Georgia had a very insignificant change in its CBI overtime. The trend in M2 to GDP ratio and CBI index are positively correlated. All countries, which had an improvement in their CBI, also improved their financial markets significantly. The trend in CBI index and trend in GDP growth seems to be not correlated. Figure 1 (d), (e) and (f) plot differences in macroeconomic variables against CBI index difference.

Correlation Analysis

Due to the small number of data points and lack of other control variables we are unable to do a regression analysis. Thus, to analyze the impact of improvement in CBI over time on macroeconomic variables, we perform rank correlation test. Spearman's rank correlation coefficient, often denoted by ρ , is a nonparametric measure of statistical dependence between two variables. It assesses how well the relationship between two variables can be described using a monotonic

function. The sign of the Spearman correlation indicates the direction of association between X (the independent variable) and Y (the dependent variable). If Y tends to increase when X increases, the Spearman correlation coefficient is positive. If Y tends to decrease when X increases, the Spearman correlation coefficient is negative. A Spearman correlation of zero indicates that there is no tendency for Y to either increase or decrease when X increases. The Spearman correlation increases in magnitude as X and Y become closer to being perfect monotone functions of each other. When X and Y are perfectly monotonically related, the Spearman correlation coefficient becomes 1.

Regarding the relationship between CBI and GDP deflator, the rank correlation test in results in Table 3 show that CBI and GDP deflator are negatively associated. The correlation coefficient is -0.54 and it is significant at 5% significance level. This finding supports the theoretical arguments about the negative relationship between CBI and inflation. Table 3 also reveals that CBI and financial market deepening measure, M2/GDP positively and significantly correlated with the expected sign. The rank correlation coefficient is 0.56 and it is significant at 10% significance level. So, higher CBI for a country leads to more credible financial markets for that country. Finally, the correlation between CBI and GDP growth is positive but not statistically significant.

Table 3: Rank correlations between CBI and economic variables.

	GDP Deflator	(M2/GDP)	GDP growth rate
Dependent Variable CBI (LVAW index)	-0.54** (0.04)	0.56* (0.05)	0.40 (0.19)
N	14	14	14

p- values are in parenthesis.

*, **, *** Denote significance at 10, 5, and 1 percent respectively.

The positive correlation is possibly due to the positive impact of both price stability and financial sector discipline on investment and growth. The reason why correlation coefficient of CBI and GDP growth is not significant can be explained by the exclusion some important determinants of GDP growth in our analysis. Many factors other than CBI also play a role in a country's GDP growth and our analysis do not control for these factors.

Our measure of CBI is LVAW index, which measures legal independence of central banks. However, actual independence, as the name suggests, depends on how the law is interpreted and implemented. It may often deviate quite substantially from the degree of legal independence. Such deviations are more evident in developing than in developed economies. The reason, most probably, is poor law enforcement in developing countries. Cukierman (1992) lists

a number of factors that may influence actual independence, such as informal arrangements between the central bank and other parts of government, the quality of the central bank's research department and the personality of key individuals in the central bank and the rest of the government.

CONCLUSION

Many transition economies have been confronted with relatively high levels of inflation after gaining their independence. This results mainly from public sector pressure to finance large government budget deficits. One way a central bank may contribute to the reduction of inflationary pressures is by acting independently of the central government.

This study analyzes the relationship between CBI and macroeconomic variables such as GDP growth, GDP deflator (inflation) and M2 to GDP ratio (financial market deepening). Effect of CBI on inflation, specifically, attracted researchers' interest. CBI independence is expected to have a negative impact on inflation because time inconsistency is less of a problem when central banks are independent. Also, financial markets and banking system are supposed to be more credible when central banks are more independent. People tend to trust and use financial intermediaries more in countries where central banks are more independent.

We find that CBI and our measure of inflation, GDP deflator, have a significant correlation. Although we cannot assess the direction of causality in this study because of limited data, treating central bank independence exogenous and GDP deflator endogenous seems reasonable. It is also found that CBI is significantly correlated with M2 to GDP ratio, which is supposed to measure how commonly financial markets are utilized. It can be argued that higher CBI strengthens people's trust in financial system. The observed current values for M2 to GDP ratio seems quite low although CBI index has increased significantly over years. This might be due to deviation of practical independence from legal independence. Also, political instability can play a role in low confidence on financial system.

Establishing an independent central bank has been a major challenge for transition economies. In the past, the central banks of these countries were subjected to instructions from the central planning bureau and/or

Ministry of Finance. Although in many transition countries central banks gained legal independence recently, de facto independence is hampered by frequent government statements and judicial actions. Breaking the historically close ties between central bank officials and central government will not be easy. Our results suggest that to sustain price stability and trust in financial markets in a country, central banks should be independent. Moreover, government pressure on central banks will harm the credibility of central banks.

REFERENCES

- Bade, R. and M. Parkin (1980), *Central Bank Laws and Monetary Policy: A Preliminary Investigation*, Ontario, University of Western Ontario.
- Barro, R. and D. Gordon (1983), "Rules, Discretion, and Reputation in a Positive Model of Monetary Policy," *Journal of Monetary Economics*, 12, pp. 101-22.
- Blinder, A. (1998), *Central Banking in Theory and Practice*, MIT Press, Cambridge, Massachusetts.
- Crowe, C., and E. E. Meade (2008), "Central bank independence and transparency: Evolution and effectiveness," *European Journal of Political Economy*, 24(4), pp. 763-777.
- Cukierman, A. (1992), *Central Bank Strategy, Credibility and Autonomy*, MIT Press, Cambridge, Massachusetts.
- Cukierman, A., S. Webb and B. Neyapti (1992), "Measuring the Autonomy of Central Banks and Its Effects on Policy Outcomes," *The World Bank Economic Review*, 6, 353-98.
- Cukierman, A., G. Miller and B. Neyapti (2002), "Central Bank Reform, Liberalization and Inflation in Transition Economies – An International Perspective," *Journal of Monetary Economics*, 49, pp. 237-264.
- Debelle, G. and S. Fischer (1994), "How Independent Should a Central Bank Be? Goals, Guidelines, and Constraints Facing Monetary Policymakers," Federal Reserve Bank of Boston, Conference Series No. 38, ed. by J. Fuhrer, pp. 195-221.
- Goodman, J. B. (1991), "The politics of central bank independence," *Comparative Politics*, pp. 329-349.
- Grilli, V., D. Masciandro and G. Tabellini (1991), "Political and Monetary Institutions and

Public Financial Policies in the Industrial Countries," *Economic Policy*, 13, 342-391.

Hielscher, K., and G. Markwardt (2012), "The role of political institutions for the effectiveness of central bank independence," *European Journal of Political Economy*, 28(3), pp. 286-301.

Jacome, L. and F. Vazquez (2005), "Any Link Between Central Bank Independence and Inflation? Evidence from Latin America and the Caribbean," IMF Working Paper No. 05/75.

Klomp, J., and J. de Haan (2009), "Central bank independence and financial instability," *Journal of Financial Stability*, 5(4), pp. 321-338.

Kydland, F. and E. Prescott (1977), "Rules Rather Than Discretion: the Inconsistency of Optimal Plans," *Journal of Political Economy*, 85(3), pp. 473-92.

Neyapti, B. (2002), "Central Bank Independence and Economic Performance in Eastern Europe," *Economic Systems*, 25, 2001, pp. 381-399.

Neyapti, B., and Berument, H. (1999), "Türkiye Cumhuriyet Merkez Bankası Ne Kadar Bağımsız," *İktisat İşletme ve Finans*, 14(165), pp. 11-17.

Posen, A. (1994), "Central Bank Independence and Disinflationary Credibility: A Missing Link," *Brookings Discussion Papers in International Economics*, Vol. 109, Brookings Institution, Washington, DC, pp. 1-48.

Schwodiauer, G., V. Komarov and I. Akimova (2006), "Central Bank Independence, Accountability and Transparency: The Case of Ukraine," *FEMM Working Paper Series*, No. 30

ABOUT THE AUTHORS

Islam Rizvanoghlu: irizvanoghlu@uh.edu

Dr. Abdulkadir Nagac graduated from University of Texas, Austin in 2009 with a PhD in Economics. He previously published in well-known journals, such as the *BE Journal of Economic Analysis & Policy* and *Applied Economics*.

Dr. Islam Rizvanoghlu is instructional Assistant Professor of Economics at the University of Houston. Dr. Rizvanoghlu completed his PhD in Economics at Rice University in 2012. He previously published articles in *Energy Economics* and *Empirical Economics*.

Appendix

Table 1A: Components of Legal Variables Weighted (LVAW)

Structure of the Legal Variables Weighted (LVAW) index	
Criteria	Values
I. Central bank CEO (0.20)	
1. Term of office of CEO (0.25)	
Equal or more than 8 years	1
6 years or more but less than 8 years	0.75
Equal to 5 years	0.5
Equal to 4 years	0.25
Less than 4 years	0
2. Who appoints the CEO (0.25)	
The Central Bank Board	1
Council composed by executive and legislative branch and Central Bank Board	0.75
By legislative branch	0.5
By executive branch	0.25
By one or two members of executive branch	0
3. Provisions for dismissal of CEO (0.25)	
No provision	1
Only for non-policy reasons (e.g., incapability, or violation of law)	0.83
At a discretion of Central Bank Board	0.67
For policy reasons at legislative branch's discretion	0.5
At legislative branch's discretion	0.33
For policy reasons at executive branch's discretion	0.17
At executive branch's discretion	0
4. CEO allowed to hold another office in government (0.25)	
Prohibited by law	1
Not allowed unless authorized by executive branch	0.5
No prohibition for holding another office	0
II. Central Bank objectives (0.15)	
Price stability is the only or major goal, and in case of conflict with government, the Central Bank has final authority	1
Price stability is the only goal that do not seem to conflict with the former	0.8
Price stability along with other objectives	0.6
Price stability along with other objectives of potentially conflicting goals (e.g., full employment)	0.4
Central Bank charter does not contain any objective	0.2
Some goals appear in the charter but price stability is not one of them	0

Table 1A: Components of Legal Variables Weighted (LVAW) *(Continue)*

III. Policy formulation (0.15)	
6. Who formulates monetary policy (0.25)	
Central Bank has the legal authority	1
Central Bank participates together with government	0.67
Central Bank in an advisory capacity	0.33
Government alone formulates monetary policy	0
7. Government directives and resolution of conflicts (0.50)	
Central Bank given final authority over issues defined in the law as objectives	1
Government has final authority over issues not clearly defined as CB goals	0.8
Final decision up to a council whose members are from the CB, executive branch, and legislative branch	0.6
Legislative branch has final authority	0.4
Executive branch has final authority, but subject to due process and possible protest by CB	0.2
Executive branch has unconditional authority over policy	0
8. Central Bank given active role in formulation of government's budget (0.25)	
Yes	1
No	0
IV. Central Bank lending (0.50)	
9. Limitations on advances (0.30)	
Advances to government prohibited	1
Permitted but subject to limits in terms of absolute cash amounts or relative limits (government revenues)	0.67
Permitted subject to relatively accommodative limits (more than 15 percent of government revenues)	0.33
No legal limitations on advances. Subject to negotiations with government	0
10. Limitations on securitized lending (0.20)	
Advances to government prohibited	1
Permitted but subject to limits in terms of absolute cash amounts or relative limits (government revenues)	0.67
Permitted subject to relatively accommodative limits (more than 15 percent of government revenues)	0.33
No legal limitations on advances. Subject to negotiations with government	0
11. Who decides control of terms of lending to government (0.20)	
Central bank controls terms and conditions	1
Terms of lending specified in law, or Central Bank given legal authority to set conditions	0.67
Law leaves decision to negotiations between the Central Bank and government	0.33

Table 1A: Components of Legal Variables Weighted (LVAW) (Continue)

Executive branch alone decides and imposes to the Central Bank	0
12. Beneficiaries of Central Bank lending (0.10)	
Only central government	1
Central and state governments, as well as further political subdivisions	0.67
Also public enterprises can borrow	0.33
Central Bank can lend to all of the above and to the private sector	0
13. Type of limits when they exist (0.05)	
As an absolute cash amount	1
As a percentage of Central Bank capital or other liabilities	0.67
As a percentage of government revenues	0.33
As a percentage of government expenditure	0
14. Maturity of loans (0.05)	
Limited to a maximum of 6 months	1
Limited to a maximum of 1 year	0.66
Limited to a maximum of more than one year	0.33
No legal upper bounds	0
15. Restrictions on interest rates (0.05)	
Must be at market rate	1
On loans to government cannot be lower than a certain floor	0.75
Interest rate on Central Bank loans cannot exceed a certain ceiling	0.5
No explicit legal provisions regarding interest rate in Central Bank loans	0.25
No interest rate charge on government's borrowing from Central Bank	0
16. Prohibition on Central Bank lending in primary market to Government (0.05)	
Prohibition from buying government securities in primary market	1
No prohibition	0