



University of Zagreb
FACULTY OF ECONOMICS AND BUSINESS
Zagreb - Croatia

Trg J. F. Kennedyja 6
10000 Zagreb, Croatia
Tel +385(0)1 238 3333
<http://www.efzg.hr/wps>
wps@efzg.hr

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Tomislav Ćorić
Dajana Cvrilje

Central bank independence: The case of Croatia



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Tomislav Ćorić

tcoric@efzg.hr

Faculty of Economics and Business
University of Zagreb
Trg J. F. Kennedyya 6
10 000 Zagreb, Croatia

Dajana Cvrnje

dcvrnje@efzg.hr

Faculty of Economics and Business
University of Zagreb
Trg J. F. Kennedyya 6
10 000 Zagreb, Croatia

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Abstract

A trend of increasing role of central bank's independence took place in the most of modern economies. The central bank independence (CBI) is seen as a way of bringing economy to a higher level. It is argued that an independent central bank is more credible and moreover, that the higher degree of central bank independence facilitates central bank to identify signals of financial problems and alert financial markets. Furthermore, an independent central bank is less likely to be exposed to the inflationary bias, inherent in monetary policy, and is more aware of the inflation costs of expansionary monetary policy. This is in line with Friedman's theoretical concept that the phenomenon of inflation is to be regulated by controlling the amount of money poured into the national economy by the central bank. In order to achieve the main goal; price stability, it is essential for a central bank to be connected to government as little as possible. However, governments generally have a certain influence over central banks, even in the case of banks who claim to be independent. The first part of the paper offers theoretical background for the central bank independence (CBI concept). The empirical evidence on the relationship between central bank independence and economic variables suggests negative relationship between central bank independence and inflation. The strong evidence of central bank independence influence on other macroeconomic variables so far has not been found. The analysis of the independence of Croatian national bank was made using 3 different methods; 1) central bank governor turnover rate (TOR), 2) Petursson G. Thorarinn criterion and 3) Cukierman, Webb and Neyapti (CWN) questionnaire. The obtained results affirm high level of central bank independence in Croatia.

Keywords

monetary policy, central bank independence

JEL classification

E58

1. Introduction

This paper consists of five sections. After introduction, second part deals with theoretical assumptions of the independence of central banks; third section comprises empirical research of the CBI, while the fourth section concentrates on situation of independence of Croatian National Bank (CNB). In the fifth part we provide conclusion and the main findings of the paper. The aim of this paper is to define independence of central banks and to examine its relation to other macroeconomic variables and measurements that are used in that process. Furthermore, the paper will analyze and evaluate independence of the CNB.

A trend of increasing role of CBI took place in the most of modern economies. The CBI is seen as a way of bringing economy to a higher level. It is argued that an independent central bank is more credible and moreover, that the higher degree of independence facilitates central bank to identify signals of financial problems and alert financial markets. Furthermore, an independent central bank is less likely to be exposed to the inflationary bias, inherent in monetary policy, and is more aware of the inflation costs of expansionary monetary policy. This is in line with Friedman's theoretical concept that the phenomenon of inflation is to be regulated by controlling the amount of money poured into the national economy by the central bank. He also concluded that inflation is always and everywhere a monetary phenomenon.¹ In order to achieve the main goal; price stability, it is essential for a central bank to be connected to government as little as possible. However, governments generally have a certain influence over central banks, even in the case of banks who claim to be independent. Independence of central banks was also initiated through out certain regional factors that contributed to the increase; the breakdown of systems which were earlier a support to stability², additionally emphasized need for alternative; good results of the German Bundesbank which had a high degree of independence; increase of the central banks' independence as a prerequisite for joining the EMU; attempts of the governments looking for institutional solutions in order to maintain stable economic conditions. Moreover, high CBI came as a logical solution; the former socialistic countries, tentative to implement free market rules, most often copied the best western practices. Similar trend also happened in central banking (Cukierman, 2006).

2. Central bank independence

2.1. Definition of central bank independence

Though at first it seems as an unambiguous and clearly defined concept, CBI has been variously defined by different authors. When defining the concept, most of the authors end up describing their own understanding of it. The earliest "definition" of CBI was offered by David Ricardo in his "Plan for the Establishment of a National Bank"³ (1824) where he said: "It is believed that the state cannot be entrusted with issuing paper money because it will most probably be abused. I admit it would be very dangerous if ministers were authorised to issue paper money. That is why I suggest that these authorities are given to commission members which will be chosen by the votes of one or both Houses of Parliament. Also, I suggest that any kind of communication between members of the commission and the ministers should be hindered. Commission should never, whatever the reasons are, lend money to the state or in any way be influenced or controlled by it. If the state needs money, it is obliged to collect it in a legitimate way: by taxes, issuing exchequer bills or lending from any other bank. In no case should the state be allowed to lend money from those who issue it" (Fraser, 1994).

Later definitions are only different interpretations of Ricardo's idea. According to Friedman (1962), the autonomy of the central bank implies a central bank-state relationship similar to one which state has with judiciary. The judiciary works in certain legal frameworks and a prerequisite for any kind of deviation is changing legal framework (Eijffinger, Haan, 1996). Walsh (2005) claimed that CBI can be found in

¹ Milton Friedman, Anna Jacobson Schwartz (1963), *A Monetary History of the United States*, p.104

² Bretton Woods system and European monetary system

³ David Ricardo (1824), *Plan for the Establishment of a National Bank*

excluding monetary policy officials from any kind of political or state influence when implementing monetary policy.

Ambiguity and different definitions of independence, as well as the complexity of relations between the central bank and the state, had impact on differentiation of various aspects of independence. In general, it can be divided onto two factors; independence of objectives and independence of instruments. Independence in choosing objectives refers to the possibility of central bank to determine, without the involvement of the government, the objectives of its activities. Instrumental independence, on the other hand, demands complete freedom while choosing instruments used to achieve the objectives. This division was accepted by most of the authors in papers written during the 1990s (see Fraser (1994), Briault et al. (1996), Amtenbrink et al. (1998)).

Cukierman (1992) divided the criteria for CBI into four groups. The first component refers to the appointment and dismissal of the governor and other bank members. The second characteristic concentrates on the ability of central bank to independently define the objectives of the monetary policy and to its ability to have a final authority in decision making process. The third component investigates the extent to which central bank defines price stability as its main objective. At last, the fourth component measures the level of restrictions that are imposed on the central bank lending. Furthermore, Cukierman also examines the TOR of central bank governors and he perceives it as a measure of “real” CBI. Siklos (1994) uses this index as the basis for developing his own index of CBI for transition countries. Grilli et al. (1991) (GMT) define two groups of criteria for CBI; political and economic independence. In the latter index, the goal set for the central bank is one of the criteria. The index defined by Loungani and Sheets (1995) builds on the work of GMT.

Moreover, Debelle and Fischer (1994) and Fischer (1995) also make the distinction between goal (political) and instrument (economic) independence. They also point out that CBI appears to be primarily associated with instrument independence while goal independence comes to second place. There is less chance that central bank would act opportunistically and the problem of time inconsistency would happen if the government does not implement monetary policy independently. Exceptions are central banks with more, most often inadequately determined objectives. The absence of explicitly formulated objectives leaves the central bank a very wide manoeuvring space where it is completely independent in setting the final objective and can determine its priorities, depending on the situation. An example of a bank with both instrumental and goal independence is the American FED. Although legally determined, objectives of FED are vaguely defined (maximum employment) which provides full independence in conducting the monetary policy (Walsh, 2005).

Evolution of understanding the significance of an independent central bank resulted in a more complex comprehension which included new segments of central bank's activities. Apart from independence in creating policy; independence in choosing objectives and instrumental independence, Eijffinger and Haan (1996) differ two more levels of independence: personal and financial. Individual independence refers to the involvement of state into employment of central bank's employees. The authors believe that it is not completely possible to eliminate the state's influence in this context. According to them, the solution could be the presence of state officials in the boards which employ people. Financial independence implies absence of any kind of credit relation between the central bank and the state. The role of CBI in implementing consistent monetary policy became more important with time. This is primarily conditioned by the results of empirical research which, in most cases, confirm negative connection between the level of independence and inflation rate. The final and the most complex elaboration of the “independence” phenomenon were done by Scheller (2006) in ECB⁴'s monograph “The European Central Bank – History, role and functions”. Considering the factors which might influence results of the central bank's monetary policy, the ECB's experts singled out five types of independence as prerequisites for optimum implementation of the monetary policy; institutional independence, legal independence, personal independence, functional and operational independence, and, finally, organisational and financial independence. The mentioned forms have legal basis in the EC Treaty and later agreements.

⁴ ECB – European Central Bank

2.2. The increasing role of CBI

The problem of independence, its measurement and influence it has on macroeconomic variables over the last twenty years have been interesting topics for the scientific community. During the 1970s and in the first half of 1980s most of developed countries were going through continuous inflation periods. The public wanted to know why. An acceptable explanation came from Barro and Gordon (1983) who found reasons for high inflation rate in the measures of monetary policy. Their thesis was that high inflation rates are results of the objectives set too high i.e. that the objectives set by central banks; GDP growth and unemployment fall, were variables set above their natural values at which inner and external balance happened. Under the influence of rational expectations, the public's response was in accordance with expansive monetary policy. Finally, the results of overheated economy were inadequately high inflation rates with an insufficient growth of real income. The cause of such high inflation asked for new explanations, especially about the motives of central bank to, under certain circumstances, subject the price stability to economic growth and unrealistic macroeconomic objectives. The reasons for inconsistent monetary policy turned out to be of uneconomic nature and it seemed that the behaviour of central banks was motivated by political influence. The governing party, in need of votes, is dominantly orientated to short-term positive economic effects. Expansive monetary policy is a unique solution, but it ignores short-term inflation effects of monetary expansion. Because of everything above mentioned, the prerequisite to solution of the problem has to be an increase in CBI.

Although the tendency for increasing CBI was connected exclusively to decrease of inflation rate, number of reasons grew with time. Cukierman (2006) thinks the trend of increased independence is conditioned by: a) global and b) regional factors. He considers two global factors; the tendency to decrease inflation and the factor of globalization. Namely, liberalization in all segments of economy, especially capital flow and expanding capital market, increased the need for stable macroeconomic conditions. High degree of CBI and its focus on preserving price stability additionally instil trust to domestic and foreign investors. Apart from this, Cukierman finds the opinion of the IMF as a certain encouragement. The IMF⁵ supported high independence of central banks and even made it a condition in the reforms it took part in.

3. The empirical research of CBI

The development of the idea of CBI had the strong influence on a number of scientists and their researches, connected to this field. At the end of 1980s and in the first half of the 1990s, a great number of researches investigated relationship between the CBI and chosen macroeconomic variables. The main subject of research was primarily the influence of independence level on inflation, or the inflation variability. The research also dealt with other macroeconomic variables and investigated the influence of the independence level on: the GDP growth, variability of the GDP growth rate, disinflation costs, interest rates, etc.

In the review done on the influence of CBI on certain macroeconomic variables, Eijffinger and Haan (1996) listed 26 researches, done in the period 1988 –1996. The pioneers in this field were Bade and Parkin who studied the influence of independence on inflation and its change back in 1988. On the example of twelve industrial countries their research confirmed the inverse relation of independence and inflation, while the causal connection between the level of independence and inflation variability was not proved. Alesina (1998) and De Haan and Siermann (1995) obtained similar results on the examples of 16, i.e. 43 countries. In contrast to this, Cargill (1995), de Haan (1995) and Eijffinger and Van Kuelen (1995) did not find any evidence on statistically significant influence of independence on inflation and its variability. The importance of the research done by Eijffinger and Van Kuelen also lies in the fact that they used four indexes (AL, BP, ES, and GMT) to determine the independence. Posen (1993, 1995) used data for 17 countries to regress the 1950-1989 average annual level of inflation on CBI, financial sector opposition to inflation (FOI) and other control variables. His results showed that there is a significant negative correlation between FOI and inflation. On the other hand, he concluded that LVAU⁶ does not have a negative

⁵ IMF – International Monetary Fund

⁶ Cukierman (1992), Legal variables aggregate unweighted

correlation with inflation. Furthermore, he regressed the influence of LVAU on FOI and concluded a positive influence of FOI on LVAU. In his second work, based on data of 32 countries, he reached the same findings. Fuhrer (1997) used the data for a set of 70 countries and regressed a measure of inflation LVAW⁷ and other macroeconomic variables. His results did not show any significant correlation between the inflation and LVAW. Campillo and Mirno (1997) follow an opinion rather similar to Fuhrer's. They claim that CBI is a relatively unimportant determinant of inflation performance, using the CUK indicator as measure of CBI. In the extended model of Campillo and Miron, some additional variables are included; average inflation in the previous period, political instability, the degree of openness, GDP per capita, participation in an exchange rate regime and a need for a tax revenue. Lane (1997) shows that the link between openness and inflation only holds for the most highly developed countries when country size is held constant. Cukierman et al. (1992) (CWN), and Cukierman (1994) summarise the empirical regularities in the correlation between CBI on the one hand and inflation and economic growth on the other, as follows:

1. Among industrial countries, the legal CBI index introduced in CWN is negatively correlated with inflation, but the turnover rate (TOR) of central governors has no correlation with inflation.
2. Among developing countries, the legal CBI index of CWN is not correlated with inflation, but the TOR is significantly related to inflation.

A number of authors such as CWN and Grilli et al. (1991), (GMT) have undertaken different types of research for a number of countries, correlating CBI with various macroeconomic variables. Following a cross-section analysis, they found that more independence for the central bank is systematically associated with lower average inflation and less variable inflation. A step further in studying independence represents researches where new variables are introduced; the GDP growth rate and its variability. In first such research conducted on data for 18 developed countries, Grill et al. (1991) confirmed the influence of independence on inflation. On the contrary, there is no statistically relevant connection between independence and GDP growth rate, or its variability. The research done by Eijffinger et al. (1993) and Frattini and Huang (1994) resulted with similar findings. However, they also examined the influence of independence on inflation variability. The results of Eijffinger and Schaling on the example of 12 developed countries deny causal connection between independence and inflation variability. On the other hand, the results of research done by Frattini and Huang confirmed the influence of independence degree on the reduction of inflation variability.

Loungani and Sheets (1995) have studied the relationship between CBI, inflation and economic growth in a cross-section analysis of 12 East European countries. Using the TOR of central bank governors and other two measures of legal independence, they concluded that independence is negatively correlated to inflation. They also concluded that high inflation, in the first years of transition, impairs economic growth. In other words, countries that manage to avoid high inflation seem to have a better chance for subsequent growth. Of course, lower initial inflation and higher GDP may be causally unrelated and driven by other factors. Meade and Crowea (2008) found robust evidence that CBI reduces inflation. This effect is robust to controls for endogeneity and measurement error via instrumental variables estimation.

Eijffinger et al. (1994) and Cukierman and Webb (1995) additionally increase the number of dependent variables in relation to mentioned research. The research done by Eijffinger et al. (1994) on the example of 10 developed countries, points to strong negative relation of independence and inflation for all used independence indexes except for GMT, while the influence of independence on inflation rate was not confirmed. In accordance with earlier researches, there is no statistically relevant connection between independence and GDP growth or independence and the variability of the growth. A step further in this research was done by studying relationship between independence and interest rate. Statistically relevant negative connection between independence and interest rate has been confirmed for all indexes used.

The Cukierman and Webb research (1995) offered a new aspect of CBI. Apart from the well-known index of TOR of central bank governors, the authors based their CBI indicator on its sensitivity to political changes. The research on 64 economies confirmed the positive influence of both central bank's political

⁷ Cukierman (1992), Legal variables aggregate weighted

sensitivity and TOR on inflation and its variability. Contrary to earlier researches, though statistically almost insignificant, the influence of TOR on GDP growth is positive. Statistical importance of the influence of political sensitivity on GDP growth was confirmed when border cases of countries which made a significant economic growth (Brazil, South Korea and Botswana), despite the fact that high values of both indexes (high TOR and high level of political sensitivity), were removed from the sample. These results are different of those obtained by Eijffinger et al. (1994), and also contrary to results obtained by most other authors. Furthermore, Cukierman and Webb (1995) studied the influence of independence on interest rate on deposits. The results confirm a significant influence of central bank's political sensitivity and TOR on variability of the ex post real interest rate which confirms the thesis on higher variability of ex post real interest rate in countries with lower level of CBI.

Alesina and Summers (1993) went furthest in analyzing the effects of independence on economic variables. Their research confirmed almost perfect negative correlation between inflation and independence and as a consequence a strong negative correlation between inflation variability and independence. Apart from this, the research confirmed the absence of any kind of independence influence on other macroeconomic variables: GNP, GNP per capita, unemployment and interest rate. These results support theoretical concept of neutrality of money (Alesina and Summers, 1993).

Table 1: The empirical research on influence of CBI)

AUTHOR	INDICATOR	SAMPLE	PERIOD	DEPENDENT VARIABLE
Bade & Parkin (1988)	BP	12 A	1972 - 86	Inflation, inflation variability,
Alesina (1988, 1989)	AL	16 A	1973 - 85	Inflation, inflation variability,
Grilli et al. (1991)	GMT	18 A	1950 - 89	Inflation, budget deficit, output growth and variability of growth
Cukierman et al. (1992)	LVAW, QVAW, TOR	72 A	1950 - 89	Inflation, inflation variability, central bank credit to public sector
De Haan & Sturm (1992)	AL, ES, GMT	14, 18 & 11 A	1961 - 87	Inflation, inflation variability, budget deficit, GDP growth rate, central bank credit to public sector
De Long & Summers (1992)	% AL and GMT	16 A	1955 - 90	GDP growth rate per working person
Alesina & Summers (1993)	% AL and GMT	16 A	1955 - 88	Inflation, inflation variability,, GNP growth, variability of growth unemployment, unemployment variability, interest rate, interest rate variability
Cukierman et al. (1993)	LVAW, TOR	50 A & B	1960 - 89	Output, growth, private investment, productivity growth, interest rate
De Haan et al. (1993)	GMT	18 A	1979 - 89	Disinflation costs
Eijffinger & Schaling (1993)	AL, BP, ES, GMT	12 A	1972 - 91	Inflation, inflation variability, output growth, variability of growth
Havrilesky & Granato (1993)	AL	18 A	1955 - 87	Inflation
Pollard (1993)	% AL and GMT	16 A	1973 - 89	Budget deficit, variance of deficit,
Posen (1993, 1995)	FOI, LVAU, LVAW	17	1950-1989	Inflation
De Haan & Eijffinger (1994)	AL, ES, GMT, LVAU	12, 18, & 21 A	1972 - 91 1977 - 81 1982 - 91	Inflation, inflation variability, output growth , variability of growth*
De Haan & Siermann (1994)	TOR	43 B	1950 - 89	Inflation
Eijffinger et al. (1994)	AL, BP, EMP, ES, GMT	21 A	1977 - 90	Inflation, inflation variability, output growth, variability of growth, interest rate, interest rate variability
Fратиanni & Huang (1994)	% 9 indicators	15 A	1960 - 90	Inflation, inflation variability, output growth, output variability

Al Marhubi & Willet (1995)	AL, GMT, LVAW	21 A	1973 - 89	Inflation
Cargill (1995)	LVAW	20 A	1962 - 91	Inflation
Cukierman & Webb (1995)	Political vulnerability	64 A & B	1950 - 89	Inflation, inflation variability, output growth, level and variance of interest rates,
Debelle & Fischer (1995)	GMT and components	18 A	1960 - 92	Inflation, Disinflation costs
De Haan (1995)	Components of LVAW	21 A	1973 - 89	Inflation, inflation variability
Eijffinger & Van Kuelen (1995)	AL, BP, ES, GMT	11	1982 - 93	Inflation, inflation variability
Gartner (1995)	GMT, LVAW, % AL i GMT	9 (16) A	1966 - 88	Disinflation costs
Walsh (1995)	GMT, LVAW	11 EZ	1973 - 91/2	Disinflation costs
Loungani & Sheets (1995)	GMT, TOR	12 A	1993	Inflation
Bleaney (1996)	LVAW	17 A	1973 - 89	Inflation, unemployment
Fuhrer (1997)	LVAW	70	1950-1989	Inflation
Campillo & Mirno (1997)	CUK, LVAW	62	1973-1994	Average inflation, political instability, the degree of openness, GDP per capita, participation in an exchange rate regime, the need for tax revenue
Crosby (1998)	LVAU	44	1962 - 91	Output variability
Temple (1998)	TOR	18	1974 - 94	Inflation
Jan Sikken & De Haan (1998)	TOR, Political vulnerability	30 B	1950 - 94	Budget deficit, monetization of deficit
Posen (1998)	LVAW	17 OECD	1950 - 89	Disinflation costs
Mangano (1998)	AL, GMT, LVAW, ES, TOR, pol. vulnerability	12	1980 - 89	Output growth, GDP deflator growth
De Haan & Kooi (2000)	TOR - index	82	1980 - 89	Inflation, inflation variability, output growth
De Haan & Sturm (2001)	TOR, TOR - index	45, 76	1980 - 89 1990 - 98	Inflation
Brumm (2006)	LVAW, TOR, Political vulnerability	24 B	1973 - 94	Inflation
Meade & Crowea (2008)	CWN, CBLD	96	1987-91	Inflation, real GDP per capita, democracy, openness, exchange rate regime

A – developing countries, B – developed countries

Source: prepared by authors according to Eijffinger, Haan, (1996), pp. 64-66

Researches on influence of independence on economy did not focus only on mentioned variables. Grilli et al. (1991) examined the influence of independence on budget deficit. Though the research confirmed connection between the variables to be negative, reliability of the relation was made questionable because of the fact it was not a statistically significant relation. Pollard (1993) as well as de Haan and Sturm (1992) obtained similar results. The later two investigated the influence of independence on both central bank's credit activity and budget deficit. Only the GMT index had statistically relevant results, while this was not the case for other two indexes (AL, ES). These results are close to results of earlier researches where statistical relevance of relation between TOR and central bank's credit activity was confirmed (see Cukierman (1992) and Cukierman et al. (1992)).

In the mean time, the number of researches in this field has decreased, while the focus of scientists remained the same. Research results, however, bring into question causal relations between CBI and other variables. De Haan and Kooi (2000) and De Haan and Sturm (2001) obtained the results that make the influence of independence on other variable questionable. In certain regressions, the CBI turned out to be statistically irrelevant variable. In both cases, statistical significance of modified TOR index was obtained only by expanding the sample to countries with high inflation rates. The paper by Ismihan and Ozkan (2004) goes a step further. They do not only deny the positive effects of independence, but also attribute to independence negative features in certain circumstances. In economies with high productivity of government investments, inclined to deficit monetization, a full CBI has a short-term positive effect. It reduces inflation, while its long-term effects on price stability are negative. The authors justify their theses with the fact that a low inflation rate stimulated with CBI decreases state investments, which causes decrease in economy productivity as well as weaker possibility of influencing inflation in the future (Ismihan, Ozkan, 2004). Related to previously described research, Brum (2006) considers the Izmihan and Ozkan findings to be results of a CBI's calculation mistake. Using the analysis of variance structure with the same data, his results emphasize strong negative relation between CBI and inflation.

4. The independence of Croatian national bank

In this section we examine the level of independence of the CNB. In the Act on the Croatian National Bank (article 2 (2), 2 (10)) CNB states to be independent while attaining its objectives and tasks. It also states that all of its members are independent while making and implementing their decisions and they do not depend nor do they ask any instructions from the state or its institutions.

If we refer to functional independence we have to examine the degree of freedom in choosing the objectives of monetary policy. CNB's main goal is attaining and maintaining price stability. According to the article 3.2 CNB will support economic policy and act according to the principles of open market economy and free competition, as long as it does not endanger its main objective. Concerning its main objective, CNB has adjusted its legislature to the demands of Maastricht agreement.

In examining the institutional freedom of CNB, we should concentrate on freedom to select the instruments of monetary policy, their definition and implementation. CNB claims to be independent while passing and implementing its decisions. It also states that it is not dependent on the instructions of the Croatian government, bodies that represent EU or third party. In accomplishing its objectives, but without endangering its main objective and tasks, CNB is allowed to cooperate with the government and other governmental bodies. Government delivers to the CNB all the proposals and reports in connection with the objectives, business and tasks of the CNB. In addition to this, government also delivers proposals of decisions, directives and acts, before they are passed on to the Parliament, to CNB to offer its opinion. At least once on a semi-annual basis, Ministry of finance consults with CNB concerning semi-annual plans of domestic and foreign indebtedness (article 38). Moreover, Ministry of finance is obligated to inform CNB about all the transactions concerning domestic and foreign debt. CNB may suggest passing laws; related to its goals, tasks or generally related to its incidence, to the government expecting that the government will afterwards suggest it to the Parliament (article 39.1). In the case of the CNB, the law does point out the independence of the functions and their implementation.

Personal independence refers to the role and status of the central bank. It also refers to the appointment and election process, removal from office, the duration of a mandate and possibility of re-election. Council of CNB consists of governor, four vice-governors at the most, deputy governor and maximum 8 external members. The Governor of the CNB is appointed by the Croatian Parliament on the proposal of the Elections, Appointments and Administration Committee, taking into account the opinion of the Finance and Central Budget Committee. In Croatia, the duration of the governor's mandate lasts for 6 years. The Deputy Governor and Vice governors are appointed by the Croatian Parliament on the proposal of the Governor of the CNB. The external members of the Council of the CNB are appointed by the Croatian Parliament on the proposal of the Elections, Appointments and Administration Committee, taking into account the opinion of

the Finance and Central Budget Committee. The members of the Council of the CNB must be citizens of the Republic of Croatia and they should have professional experience in monetary, financial, banking or legal matters. The members of the Council of the CNB are appointed for a period of six years. Law usually puts certain limitations for Council members to avoid possible conflicts of interests, so in Croatia they also exist. Restrictions that members should obey are; they can not perform as representatives in the Parliament nor take part in matters in which they would be employed by the Parliament or by the government. Moreover, a member of CNB can not be a member of the government. Also, they can not officiate tasks in the local governance and self-government nor in political parties or syndicate organizations. Members are not allowed to work as associates in banks, audit institutions and other legal institutions related to banks or controlled by CNB. Also, they may not own shares or holdings in other legal persons connected with the said persons by ownership, management or function, or shares or holdings in audit firms and persons connected there with. In addition, member's spouse and children are also not allowed to own shares or holdings in the institutions which are authorised by or supervised by the CNB (article 45). Regarding removal from office, it will occur in the case of a felony, serious violations and longer working inability owing to illness. Furthermore, it will occur if a member itself demands to be removed from office, if it fails to submit, or submits a false declarations concerning restrictions (article 46).

Financial independence relates to budget independence and prohibition of monetary financing. Central banks should not allow themselves to get in a position of insufficient financial resources, necessary to fulfil its duties. There are certain issues that central banks must settle to be financially independent; who manages the budget, how to restore net loss, is it allowed to finance government and if it is, when is it allowed etc. It is important to stress out that CNB is independent from the Ministry of finance since relationship of this two could lead to high inflation. However, a certain contact between this two exists. CNB performs fiscal agency function, function of depository, function of participant in legislative procedures and function of a consultant of Ministry of finance. Nevertheless, CNB points out that the budget is managed by the bank, independently from any governmental institution. The Council of CNB adopts the financial plan while the capital remains is in the hands of the state. Concerning net loss, if it occurs, it is usually covered from the CNB's reserves. In the case of insufficient reserves the loss can be covered from the state budget or by issuing stocks. In Croatia direct financing of government is firmly forbidden, nevertheless CNB is allowed to purchase government securities on secondary market, and thereby finance government indirectly.

4.1 Measuring the CBI

In order to examine the level of independence of CNB, we use three methods ; 1) TOR of central bank governors, 2) Petursson G. Thorarinn criterion of determining CBI and 3) Grilli, Masciandaro, Neyapti (GMT) questionnaire.

4.1.1 TOR of central bank governors

For the developing countries, like Croatia, the most appropriate indicator of CBI is the TOR of central bank governors which is defined as an average duration of the governor's office. It is calculated as a ratio of number of governors in a certain period and duration of the period.

$$\text{TOR of central bank governors} = \frac{\text{number of governors in a certain period}}{\text{duration of the period}} \quad (1)$$

Cukierman defined an upper limit for this rate to 0, 2 - 0, 24 when the governor is elected every 4 to 5 years. A lower rate indicates that the central bank is more isolated from the government pressures, at the same time suggesting greater independence of central bank in defining objectives of the monetary policy. Cukierman also stated that an extremely low TOR of central bank governors does not indicate a high level of independence, but it can prove that the governor is dependent on the government. During the last 19

years the CNB had four governors; Ante Čičin-Šain (1990-1992), Pero Jurković (1992.-1996.), Marko Škreb (1996-2000) and Željko Rohatinski (2000-). The observed period is 19 years and the number of governors in the observed period is 4. This makes TOR index of 0, 21, a result within the desired interval.

4.1.2 Petursson G. Thorarinn criterion of determining central bank's independence

Petursson G. Thorarinn criterion of determining the level of CBI arises out from the analysis of 5 criteria. The relative weight of every criterion is based on its importance for achieving CBI. According to Petursson G. Thorarinn criterion, the CBI is measured on the scale from 0, 7 to 65.

Table 2: CNB independence according to Petursson G. Thorarinn criterion

Criterion	Weight	Points	Total
The extent to which statutory objectives provide the central bank with a clear focus on price stability	1	10	10
The extent to which the central bank determines the setting of policy targets	1	10	10
The extent to which the central bank determines the adjustment of monetary policy instruments	2	10	20
The extent to which treasury funding through the central bank is prohibited	2	10	20
The length of the governor's term of office	0,5	7,1	3,55
Total			63,55

Source: authors' calculations

The analysis showed that the level of CBI in Croatia is at the stance of 63, 55 which should be interpreted as a very high result. The reason for not achieving the maximum level of 65 points is the fact that the duration of the governor's term of office has to be at least 8 years or longer to satisfy the criterion entirely.

4.1.3 Cukierman, Webb and Neyapti questionnaire

The CWN questionnaire is used as a measure of central bank legal independence. In order to maintain the full consistence of the methodology the questionnaire was fulfilled by CNB specialists. Measuring legal CBI relies on the analysis of 16 different legal variables, each coded from 0 (lowest) to 1 (highest), showing the level of independence.

Table 3: CNB independence according to Cukierman, Webb and Neyapti questionnaire

Variable	Weight	Points
Chief executive officer (CEO)	0,20	
Term of office		0,75
Who appoints CEO		0,50
Dismissal		0,83
May CEO hold other offices in government		1,00
Policy formation	0,15	
Who formulates monetary policy		1,00
Resolution of conflict		1,00
Role in the government's budgetary process		0,00
Objectives	0,15	1,00
Limitations on lending to the government		
Advances (limitation on no securitized lending)	0,15	1,00
Securitized lending	0,10	1,00
	0,10	1,00

Terms of lending	0,05	1,00
Potential borrowers from the bank		1,00
Determination of the limits on central bank lending	0,025	
	0,025	1,00
Maturity of loans	0,025	1,00
Interest rates on loans	0,025	1,00
Is the central bank prohibited from buying or selling government securities in the primary market		
Total	1,00	0,904

Source: authors' calculations

The analysis of CNB's independence according to the CWN numerical coding confirmed a rather high level of legal independence. On the scale from 0 to 1, the legal independence of our monetary authority was approximated at the level of 0,904.

5. Conclusion

A trend of increasing importance of CBI is present in most of developed economies. The CBI is perceived as a conventional trend that almost all central banks follow. It appears to be a condition for conducting credible monetary policy. Delegating monetary policy to an independent central bank is supposed to induce greater price stability and better overall economic situation, since an independent central bank is less likely to be exposed to the inflationary bias, inherent in monetary policy, and is more aware of the inflation costs of expansionary monetary policy.

The presented empirical evidences concerning relation between CBI and economic performance suggests negative relationship between CBI and inflation. The strong evidence of CBI influence on other macroeconomic variables was not found.

The analysis of the independence of CNB was made using three methods; 1) TOR of central bank governors, 2) Petursson G. Thorarinn criterion of determining central bank's independence and 3) Cukierman, Webb and Neyapti questionnaire. The obtained results affirm high level of CBI in conducting the monetary policy in Croatia.

Literature

1. Alesina, A. and Summers, L. (1993). "Central Bank Independence and Macroeconomic performance: Some Comparative Evidence," *Journal of Money, Credit, and Banking*, Vol. 25, Pp. 151-162
2. Barro, R. J. and Gordon, D. (1983). "Rules, Discretion, and Reputation in a Positive Model of Monetary Policy," *Journal of Monetary Economics*, No.12, Pp 101-121
3. Brumm, H. J. (2006), „The effect of central bank independence on inflation in developing countries“ *Economics Letters* , No. 90, Pp 189–193
4. Campillo, M. and Miron, Jeffrey A. (1997), "Why does Inflation Differ Across Countries?," *University of Chicago Press*, Working paper, No. 5540, 1997
5. Croatian national bank, *The act on the Croatian national bank*, Publication: June 2008, <http://www.hnb.hr/propisi/zakoni-htm-pdf/e-zakon-hnb--2008.pdf?tsfsg=df72c24360efa155d626a7396bdeb798>, 14.04.2009
6. Crosby, M., (1998). "Central Bank Independence and Output Variability," *Economics Letters*, No. 60, Pp 67-75
7. Crowea, C., Meade Ellen E. (2008),“ Central bank independence and transparency: Evolution and effectiveness“ *European Journal of Political Economy*, Vol. 24, Pp 763–777
8. Cukierman, A. et al (1992). "Measuring the Independence of Central Banks and Its Effects on Policy Outcomes," *World Bank Economic Review*, Vol. 6, Pp 353-398

9. Cukierman, A. and Webb, S.B. (1995). "Political Influence on the Central Bank: International Evidence," *World Bank Review*, Vol. 9, Pp 397-423
10. De Haan, J. and Kooi, W. (2000). "Does Central Bank Independence Really Matter? New Evidence for Developing Countries Using a New Indicator," *Journal of Banking and Finance*, Vol. 24, Pp 643-664
11. De Haan, J. et al. (2003), "Measuring central bank independence: A latent variables approach" *Scottish Journal of Political Economy*, Vol. 50, Pp 326-340
12. De Haan, J. et al. (2008), „Does central bank independence still matter?“ *European Journal of Political Economy*, Vol. 24, Pp 717-721
13. Debelle, G., Fischer, S., (1995) „How independent should central banks be?“ In Fuhrer, J., *Goals, Guidelines and Constraints Facing Monetary Policymakers*, Federal Reserve Bank of Boston Conference Series, Pp. 195-221
14. Eijffinger, S.C.W., De Haan, J. (1996), "The Political Economy of Central-Bank Independence", Princeton University, New Jersey, Special papers in International economics, No. 19, May 1996
15. Eijffinger S.C.W. et al. (1997), "Central Bank Independence: A Panel Data Approach," *Public Choice*, Vol. 89, 163-182.
16. Friedman, M., Schwartz, Anna J. (1963), *A Monetary History of the United States*, Princeton University Press
17. Fuhrer, J.C. (1997), "Central Bank Independence and Inflation Targeting: Monetary Policy Paradigms for the Next Millennium?" *New England Economic Review*, 1/2, 19-36
18. Grilli et al. (1991), "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy*, No. 13, Pp 341-392.
19. Ismihan, M., Ozkan, F.G. (2004), "Does central bank independence lower inflation?" *Economics Letters*, Vol.84, Pp 305-309
20. Loungani, P. and Sheets, N. (1995), "Central Bank Independence, Inflation and Growth in Transition Economies", *International Finance Discussion Papers, FRS*, No. 519
21. Loungani, P. and Sheets, N. (1997), „Central Bank Independence, Inflation, and Growth in Transition Economies“ *Journal of Money, Credit and Banking*, Vol. 29, Pp. 381-399
22. Neyapti, B. (2001), „Central bank independence and economic performance in eastern Europe“ *Economic Systems*, No. 25, Pp 381-399
23. Pétursson, Thórarinn G (2004). "New focuses in central banking: Increased independence, transparency and accountability", *Monetary Bulletin 2000/4*, Pp. 49-62
24. Posen, A. (1995). "Declarations are not Enough: Financial Sector Sources of Central Bank Independence.", *NBER Macroeconomic Annual 1995*, Vol.10, Pp 253-274
25. Siklos, Pierre L. (2008) „No single definition of central bank independence is right for all countries“ *European Journal of Political Economy*, Vol. 24, Pp 802-816