Routledge
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Economic Research-Ekonomska Istraživanja

ISSN: 1331-677X (Print) 1848-9664 (Online) Journal homepage: http://www.tandfonline.com/loi/rero20

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To cite this article: Tomislav Ćorić, Hrvoje Šimović & Milan Deskar-Škrbić (2015) Monetary and fiscal policy mix in a small open economy: the case of Croatia, Economic Research-Ekonomska Istraživanja, 28:1, 407-421, DOI: 10.1080/1331677X.2015.1059073

To link to this article: http://dx.doi.org/10.1080/1331677X.2015.1059073

Economic Research-Ekonomska Istraživanja, 2015
Vol. 28, No. 1, 407–421, http://dx.doi.org/10.1080/1331677X.2015.1059073

Monetary and fiscal policy mix in a small open economy: the case of Croatia

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(*Received 5 September 2013; accepted 15 April 2015*)

In this article we use a structural vector autoregression (VAR) model to analyse the possibilities of monetary and fiscal policy in achieving main economic policy goals, namely price stability and economic growth, in Croatia from 2004 to 2012. Our main results indicate that expansionary monetary and fiscal policies both have positive effects on economic activity. On the other hand, fiscal expansion leads to nominal exchange rate appreciation while monetary expansion has depreciation effects on nominal exchange rate. Thus the main conclusion of the article is that coordinated measures of monetary and fiscal policies could achieve both goals, i.e. that fiscal and monetary authorities can stimulate economic growth without endangering price stability.

Keywords: monetary policy; fiscal policy; SVAR; Croatia

JEL classification: E52; E61; E62; H50

1. Introduction

Croatia can be described as a small, open and highly eurised economy with managed exchange rate and free capital flows. Such characteristics are very important in the context of economic policy as they determine the manoeuvring space and possibilities of policymakers to achieve main policy goals. Also, those characteristics are important in determining the adequate theoretical framework for the analysis of interactions and effectiveness of fiscal and monetary policy.

The aim of this article is to analyse the possibilities of monetary and fiscal policy in Croatia in achieving specified macroeconomic goals, with price stability being the main goal of monetary policy (Law on Croatian National Bank; NN, no. 75/2008. and 54/2013) and economic growth as one of the main goals of fiscal policy (Ministry of Finance, 2012).[1]

In our empirical analysis we use a structural vector autoregression (VAR) framework as VAR methodology is suitable for the analysis of dynamic interactions of various (endogenous) variables in economic system and structural specification enables the researcher to base the assumptions of the model on rigorous economic theory.

Although there were some discussions on policy mix and effectiveness of monetary and fiscal policy in Croatia, this is the first article that: (1) uses open economy framework in the empirical analysis of monetary and fiscal policy interaction in achieving main policy goals; (2) uses structural identification of the empirical model based on a theoretical model; (3) analyses economic policy effectiveness in the recessionary

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environment; and (4) presents the detailed literature review on the policy analysis in open economy framework. These can be seen as the main contributions of the article.

After the brief literature review, the second part of the paper offers the description of structural specificities in Croatian economy and some constraints of monetary and fiscal policy. The third part provides theoretical foundation for the identification of structural VAR model. Data description and the results of empirical analysis are presented in the fourth part, followed by concluding remarks.

2. Literature review

The Mundell-Fleming model is considered to be a fundamental theoretical framework for the analysis of effects of economic policy in small open economies. According to Young and Darity (2004), although there are several influential theoretical models describing open economies (e.g. Salter-Swan, Polak-IMF, Johnsonian-monetary approach), the Mundell-Fleming model became, and is still the model of preference for both policy analysis and pedagogy.

Furthermore, assumptions of that model represent a good theoretical foundation for the identification structural vector autoregression (SVAR) model in the empirical part of analysis as it allows analysis of the interaction of monetary and fiscal policy, considering all important characteristics of Croatian economy – openness, managed exchange rate framework and capital mobility.

Considering the above, the review of the literature below refers to papers that use basic or expanded version of the Mundell-Fleming model, and to those using VAR methodology. A brief review of these papers is given in Table 1.

The existing empirical studies certainly put the Mundell-Fleming model at the top of policy literature and derive conclusions from standard Keynesian theoretical framework. However, it should be noted that there is a wide literature in which empirical models are based on alternative theoretical assumptions which also confirms the Mundell-Fleming model predictions (Corsetti & Passineti, 2001).

Empirical studies dealing with the effectiveness and interactions of fiscal and monetary policy in Croatia through the SVAR framework do not exist. Only Rukelj (2009) uses structural vector error correction model (SVEC) in testing the efficiency of fiscal and monetary policy interaction. The main assumption of that research is a closed economy model defined by three variables: central government expenditure, money supply and economic activity index. The results of this study were not clear enough to make general conclusions about the effectiveness of monetary and fiscal stimulus on economic growth.

Studies partially testing the effectiveness of either monetary or fiscal policy in Croatia are more frequent. Šimović and Deskar Škrbić (2013), Deskar Škrbić, Šimović, and Ćorić (2014) and Grdović Gnip (2013) use the SVAR model, respectively Blanchard-Perotti identification, in estimating fiscal policy effects and the size of fiscal multipliers in Croatia. On the other hand, monetary policy effectiveness is analysed through research of the monetary transmission (Vizek, 2006) and credit channels (Ćorić, 2008). Finally, Erjavec, Cota, and Jakšić (2012) analysed the effects of macroeconomic shocks on fluctuations of real output in Croatia using the SVAR model.

3. Specificities of monetary and fiscal regime in Croatia and possibilities of counter-cyclical policy in recession

Effects of monetary policy in Croatia can be analysed only when bearing in mind circumstances in which the domestic monetary system was built. The problem of high,

Table 1. A brief literature review: VAR models and Mundell-Fleming model predictions for open economies.

Authors	Model	Period (inducing data frequency) and country	Variables	Main results
Conway (1998)	SVAR	1977–1996 Quarterly New Zealand	Foreign and domestic real output, foreign real interest rate, terms of trade, total employment hours, domestic real interest rate	Shocks of the foreign sector have significant effects on domestic variables and represent important source of business fluctuations.
Huh (1999)	SVAR (long run restrictions)	1973–1995 Quarterly Australia	Nominal interest rate, real output, the nominal exchange rate, prices and nominal money; structural shock variables (world interest rate, aggregate supply, real spending (IS), money supply and money demand shocks)	Exogenous disturbances (world interest rate, aggregate supply, IS, money supply and money demand shocks) have significant impact on endogenous variables. Dynamic responses of the estimated model to the structural shocks are analysed and shown to match most of the predictions of the Mundell-Fleming model.
Dungey and Pagan (2000, 2009)	SVAR	1980–1998 (updated to 2006) Quarterly Australia	Domestic (endogenous) economy (real All-Ordinaries Index, Gross National Expenditure, GDP, inflation rate, policy interest rate instrument and real exchange rate); International sector (US GDP, the real Dow-Jones Index, the terms of trade, exports and the real US interest rate)	Overseas activity is generally a substantial contributor to domestic activity (for example the negative influence of the Asian crisis on exports). The influence of monetary policy on the economy is seen to contribute to stabilising activity, although the effects are not large. In a 2008 paper the inclusion of the longer run relationships suggests that the previous model overstated the impact of interest rate shocks on macroeconomic activity, demonstrating the potential importance of these modelling innovations to policymakers.
Lee and Chinn (2006)	SVAR	1979/1980–2000 Quarterly G7 Countries (USA, Canada, UK, Japan, Germany, France, Italy)	Real exchange rate (CPI-deflated real exchange rate series), current account data	Temporary shocks play a larger role in explaining the variation in the current account and influence depreciation of real exchange rate. Permanent shocks play a larger role in explaining the variation in the real exchange rate.

(*Continued*)

Table 1. (*Continued*).

Authors	Model	Period (inducing data frequency) and country	Variables	Main results
Buckle, Kim, Kirkhama, McLellana, and Sharma (2007)	SVAR	19,832,004 Quarterly New Zealand	Wide range of 13 variables organised in four blocks (terms of trade block, domestic economy block, international economy (exogenous) block and domestic climate (exogenous) block).	Climate and international trade price shocks have been more important sources of business cycles fluctuations than international or domestic financial shocks.
De Michelis (2009)	SVAR	1997–2007 Quarterly	Real GDP growth, inflation (HICP), exogenous shocks	Correlation of the demand shocks between Iceland and the euro area have been Positive, but low, while supply shocks have been uncorrelated.
Dungey and Fry (2009)	SVAR (sign restrictions cointegration and traditional exclusion restrictions)	1983–2006 Quarterly New Zealand	Twelve endogenous variables (foreign output, price of exports, price of imports, real government expenditure, real taxation revenue less transfers, absorption (represented by real gross national expenditure), ratio of sovereign issued debt to GDP, real GDP, house price inflation, consumer price inflation, short term interest rate, trade weighted exchange rate); exogenous variables (climate and the international interest rate)	In the observed period the influence of the fiscal policy stance on output has sometimes been substantial, and generally outweighs the contribution of monetary policy shocks.
Ncube, Eliphas, and Nombulelo (2012)	SVAR	1973–2007 Quarterly South Africa	Component of aggregate output, consumer price index, Money (M3), real interest rate (defined as difference between the money market rate and inflation rate), rand-dollar exchange rate, wealth; US exogenous variables (federal fund rate, M1, medium term bond yield)	US monetary stimulus shock leads to weak consumer price inflation, rand-dollar appreciation, real stock price revaluation, bond yield declines, decline in monetary aggregates and real interest rates in South Africa. Other findings are consistent with predictions of a small open economy Mundell-Fleming model.

(*Continued*)

Table 1. (*Continued*).

Authors	Model	Period (inducing data frequency) and country	Variables	Main results
Born, Jusen, and Muller (2013)	Panel VAR	1986–2011 Biannual OECD Countries	Government spending (consumption expenditures), GDP, real interest rate, real exchange rate, net export-GDP ratio, forecast of the growth rate of government spending for period t + 1	Government spending multipliers are larger under fixed exchange rate regimes, the difference relative to floating exchange rates is smaller than what the traditional Mundell-Fleming analysis suggests. Furthermore, there is little evidence for the specific transmission channel which is at the heart of the Mundell-Fleming model.

Source: Authors.

chronicle inflation in ex-Yugoslavia and hyperinflation in 1992 and 1993 required a strong anti-inflationary programme that was implemented in 1994, with the exchange rate as a monetary policy anchor. Thus, price stability, as a main monetary policy goal in Croatia, is achieved through the exchange rate stability (see Figure 1).

Exchange rate stability is also important given the high degree of eurisation[2] of Croatian economy and the banking sector that induced the introduction of the currency clause. This is a term in the loan agreement which says that the exchange rate risk within the credit relationship is fully borne by the borrower. Currency clause was well integrated next to the strategy of anchor of the exchange rate. This runaway of savings into the foreign currency justifies a psychological phenomenon: the permanent fear of inflation and devaluation based on the experience from two or more decades ago.

The monetary strategy of the exchange rate anchor, currency clause and high euroisation are important factors in creation of the present state of the national monetary system. Furthermore, significant impact on the development of the system had the fact that domestic banking sector in the late 1990s was privatised and sold to foreign owners. In the conditions of weak local liquidity and the effort of the central bank to control money supply, local banks turned to foreign resources. In circumstances of constant cheap cash inflows from abroad, the central bank was completely ignored as a 'lender of last resort'. Its interest rates were and remained non-referent. Its money issuing function was reduced to an instrument of foreign exchange auctions, while the operations on the open market as the main instrument of modern monetary policy were and are of secondary importance.

On the other hand, fiscal policy plays a major role in the creation of the fiscal position and has a direct effect on economic activity, especially through public investments in infrastructure (such as highways), substantial number of public employees and tax system characteristics. However, many indicators show that fiscal policy was not led in a prudent way, as Croatia recorded constant fiscal deficits regardless of the positive GDP growth rate before the crisis (see Figure 2). Also, during the same period the structure of government spending has not changed and was primarily directed to meet

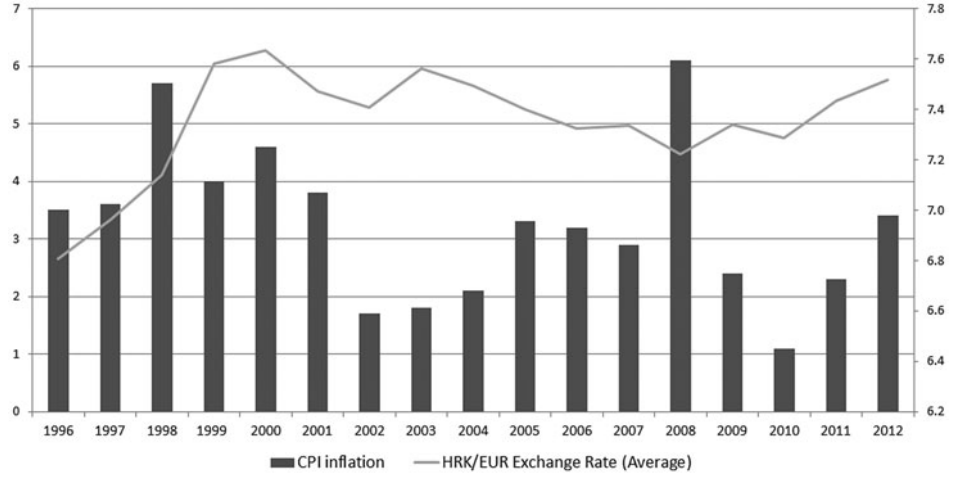

Figure 1. Exchange rate stability and moderate inflation in Croatia 1996–2012.
Source: Croatian National Bank (2013).

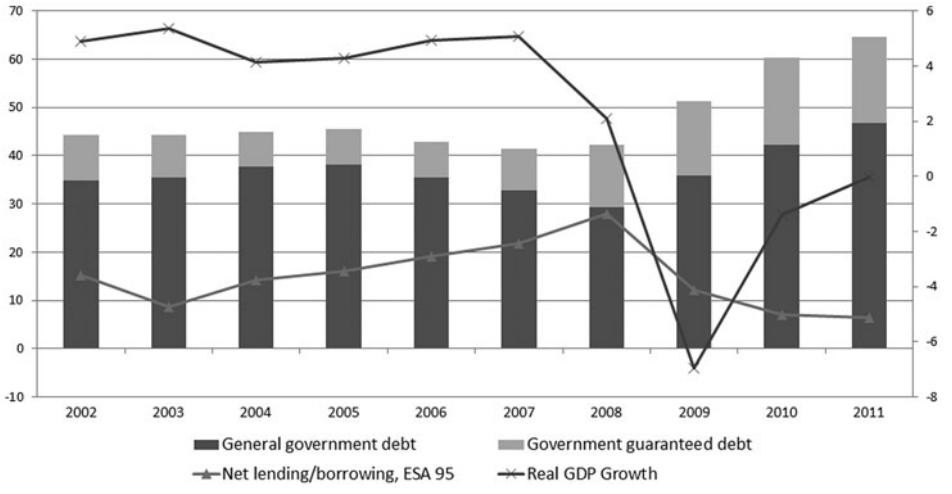

Figure 2. Public debt, fiscal deficit and real GDP growth (in % GDP).
Source: Croatian National Bank (2013) and Ministry of Finance (2013).

current social needs (pensions, health care, agriculture subsidies, etc.), in order to preserve social peace and stability.

The real need for fiscal consolidation after the outburst of recession and joining the EU has additionally caused (social) resistance to the changes and also provoked the instability of the government.[3] Without reforms and fiscal consolidation, public deficit, financing needs and public debt significantly increased, with the latter moving above 60% of the GDP, thus breaking both fiscal rules from the Maastricht agreement and putting Croatian credit rating in speculative grade. In such conditions, the manoeuvring space of fiscal policy was significantly reduced.

In the context of reactions to the global financial crisis that spilled to south European economies (SEE) countries during 2009, monetary and fiscal policies are seen as significantly constrained. The beginning of the crisis revealed the weaknesses of the 2000's Croatian economic model based on capital inflows, credit and construction boom and expansionary fiscal policy. The problems with the liquidity and lower demand followed by the economic downturn in the European Union very quickly turned into a multi-year recession, with which Croatia is still faced.

Monetary conditions tightened but were accompanied by lower demand in private sector as both, corporate and households, started to deleverage. Unfortunately, the contribution of the central bank to prevent negative trends is more than limited, because it is almost impossible to significantly change the existing conditions in the monetary sphere of the economy. Transmission channel is limited by the ownership structure of the banking sector and low demand for loans and if the central bank decides to abandon the exchange rate anchor that would inevitably lead to strong depreciation and would directly affect most of the debtors who are bound by the foreign currency clause.

In addition, there would be an immediate increase in the external debt whose repayment already causes problems due to a decrease of the credit ratings and more expensive refinancing conditions. The same can be applied to public debt which is mostly financed from abroad, i.e. with currency clause in the domestic financial market. The possible positive effect of depreciation on the export sector and on the increase of

competitiveness could be offset by the above mentioned effects on debts and the increase of energy and intermediate products. On the other hand, the abolition of the currency clause would lead to significant imbalance in the balance sheets of the banks.

Because of the existing restrictions of monetary policy, the only possibility for more significant activity in the conditions of crisis can be seen in the fiscal policy sphere. However, due to hard budget constraints (high and ascending public debt, constant fiscal deficits, decrease of credit rating, increase of interest rates and more expensive market sources that finance the public debt) expansionary fiscal policy in Croatia could not be effective. Since the discretionary measures are in the political decision-making domain, timely activities of the fiscal policy, regardless of the possible economic restrictions, often come down to the domain of 'alchemy' (Leeper, 2010).

The political indecision regarding deficit crisis only caused additional extrusion of private investments, deterioration of financing conditions, domestic currency depreciation pressures and deceleration of the economic recovery (growth). Although Croatia has relatively slowly entered the crisis, the fiscal policy of 'not taking any action' has led to the fifth successive year of recession, i.e. stagnation.

With the assumption that the monetary policy and price stability have no alternative, Croatia has to accomplish reliable fiscal position as soon as possible. This implies a number of reforms within the public sector and abolition of certain social benefits. Moreover, it implies serious long-term budget planning and adequate public debt management, thereby ensuring the fiscal sustainability and return of confidence within the domestic and international financial market. This way, fiscal 'surplus' would be generated, leaving enough space for a timely countercyclical reaction of the fiscal policy. Unfortunately, the existing 'policy mix' does not correspond to such turn of events.

As the primary goal of the monetary policy is price stability, the main goal set for the fiscal policy is then the achievement of satisfactory economic growth. After all, the stabilisation function of fiscal policy indirectly implies that goal. In that context, the main goal of this article is to analyse the possibilities of the policy mix (monetary and fiscal policy) to achieve the mentioned goals. In the next section we present a model and data that are used for the empirical analysis.

4. Model and data

Our baseline model takes the form:[4]

$$\sum_{s=0}^{p} A_s y_s = \varepsilon_t, \tag{1}$$

where y is a vector of endogenous variables, matrix A_j is a matrix of structural coefficients which contains the information on the relationship among all variables in the model to period p. Vector ε_t is a vector of independent, normally distributed random errors, with distribution $MVN(0, I)$. Vector y includes yearly changes of seasonally adjusted domestic industrial production (IP_t), central government expenditures-to-revenues ratio (G_t), monetary aggregate M1a (M_t) and nominal effective exchange rate (ER_t) for the period from 2004m7 to 2012m11. We also include constant and a *dummy* variable which takes a value of 1 from the beginning of the crisis (M92008, according to Quandt-Andrews test of structural break).

In addition, to control the model for external shocks, we include net exports as exogenous variable. Although it is preferable to include such variables in the model as

endogenous variable methodological changes in small sample so the inclusion of additional variables could negatively affect the quality of results. Also, net exports cannot react to changes of any of above mentioned variables instantaneously, while net export dynamics can directly affect all of the variables so it is convenient to incorporate net exports as exogenous variable (in identification of structural model we could directly model such interactions by imposing 'null-limitations' on the parameters that show the responses of net exports on the rest of the variables).

As for the data, we use monthly series because VAR framework requires large samples and the changes in government finance statistics (GFS) methodology allow us to analyse fiscal policy effects only from 2004, as earlier years are not methodologically comparable with post-2004 period. The sources of data are Croatian Bureau of Statistics for industrial production and net exports, Croatian National Bank for series of nominal exchange rate and Ministry of finance for series of government revenues and expenditures. As for the fiscal variable, we constructed the series as a ratio of government expenditures to government revenues because ratio is less volatile than the deficit figure.

Model (1) cannot be directly estimated using OLS (because of contemporaneous effects, which are correlated withε) so we estimate a reduced form model. Furthermore, the analysis is based on impulse response functions and variance decomposition so it is necessary that shocks are mutually uncorrelated. By multiplying (1) with A_0^{-1} the reduced form model (which we estimate) takes the form:

$$y = \sum_{s=1}^{p} B_s y_{t-s} + u_t \tag{2}$$

where $A_0^{-1}\varepsilon_t = u_t$, $MVN(0, \sum_u)$ and $B_j = A_0^{-1}A_j, j = 0, \ldots p$.

Number of time lags form model (2) is set to 2, according to SIC and FPE criteria. A greater number of lags is not desirable due to the short time-series as well. Also, considering the frequency of data, selection of this time lag has its anchor in economic intuition. For the model (2) adequacy and stability analysis is conducted. The results of the residual analysis (test of autocorrelation and heteroskedasticity test) and stability test shown in the Appendix 1 indicate that the model is appropriate and stable. The next step of our analysis is to retrieve structural shocks, based on the information from model 2, in order to conduct impulse response analysis on mutually uncorrelated (interpretable) residuals.

According to Lutkepohl (2005), in impulse response analysis the emphasis has shifted from specifying the relations between the observable variables directly to interpreting the unexpected part of their changes or the shocks. Therefore, it is not uncommon to identify the structural innovations ε_t directly from the forecast errors or reduced form residuals u_t. One way to do so is to think of the forecast errors as linear functions of the structural innovations so we have the relation $u_t = B\varepsilon_t$, hence $\sum_u = B\sum_\varepsilon B'$.

Normalising the variances of the structural innovations to one ($\varepsilon_t \sim (0, I_K)$ gives $\sum_u = BB'$. Due to the symmetry of the covariance matrix, these relations specify only K (K+1)/2 different equations and we need to impose K(K−1)/2 further relations to identify all K^2 elements of B. As the number of endogenous variables is K=4, we need to impose 6 restrictions. In order to identify this system, we make some assumptions about the mechanisms in Croatian economy, based on real-life experience.

Firstly, we assume that government expenditure-to-revenue ratio cannot instantaneously react to shocks in money supply and exchange rate, while it can react to

business cycle fluctuations and discretionary shocks in fiscal policy, which gives us two restrictions. Secondly, we assume that money supply cannot instantaneously react to changes in government deficit, while it can react to business cycle fluctuations, changes in nominal exchange rate and discretionary measures, which gives us one restriction. Thirdly, we assume that economic activity cannot instantaneously react to changes in exchange rate (only with time lag), which gives us one more restriction. Finally, exchange rate, by assumption, cannot instantaneously react to changes in government deficit and economic activity (only through demand for money), so we have two more restrictions. Thus, our system is just-identified.

5. Results

As it was explained in the second part of the article, the primary interest of the research is to analyse the effects of monetary and fiscal policy on two variables: economic growth and nominal exchange rate. In that context, it is necessary to point out that, in recent years, strong media and expert pressure was put on the policymakers in Croatia to implement expansionary monetary and fiscal policy. The reason for that lays in the fact that Croatia was, besides Greece, the only country that has been in recession for four years in a row. Therefore, in this part of the article we analyse the effects of the policy measures on both goals, in order to determine whether there is any possibility of coordination between the policies in their implementation.

According to the Mundell-Fleming model assumptions, simultaneous monetary and fiscal expansion, in the conditions of complete mobility of capital and managed (nearly fixed) exchange rate, would result in increase of the economic activity, while preserving exchange rate stability. More precisely, according to the expectations of the model, the fiscal expansion would result in the increase of the income (through multiplier mechanism) and appreciation pressures on the domestic currency. Since the central bank has the assignment to keep the exchange rate at a certain level or keep it between certain implicit frames of fluctuation, it will have to react by monetary expansion in order to satisfy an excess demand for domestic currency. In that way it will annul the pressures on the currency and simultaneously stimulate the economic activity through lower interest rates.

As it is usual in VAR analysis, the graphs in Figure 3 show the effects of the increase of budgetary expenditures to revenues ratio (G) and the increase of the monetary aggregate M1 (M) (the shock from one standard deviation) on the industrial production and nominal effective rate, in *impulse response* format.

The upper left graph shows that the fiscal expansion leads to an increase of industrial production in the whole analysed period. However, with the given level of confidence the effect is statistically significant from third to eighth month. Hence, fiscal expansion would accelerate the economic activity which means that the fiscal policy in Croatia (in the short-term) can achieve its main goal. However, the bottom left graph shows that the fiscal expansion has significant appreciation pressures on the domestic currency, that are statistically significant from third to seventh month after the shock.

The upper right graph shows the effect of the increase of monetary aggregate M1 on the industrial production. If we would interpret the increase of this aggregate as a consequence of the increase of the primary money or money in circulation (monetary expansion) we could conclude that the monetary expansion has a strong and positive effect on the industrial production. The effect is statistically significant from first to fifth month after the shock. On the other hand, the increase of the monetary aggregate M1 has (partially weak) depreciation effect on the domestic currency, which is shown in the

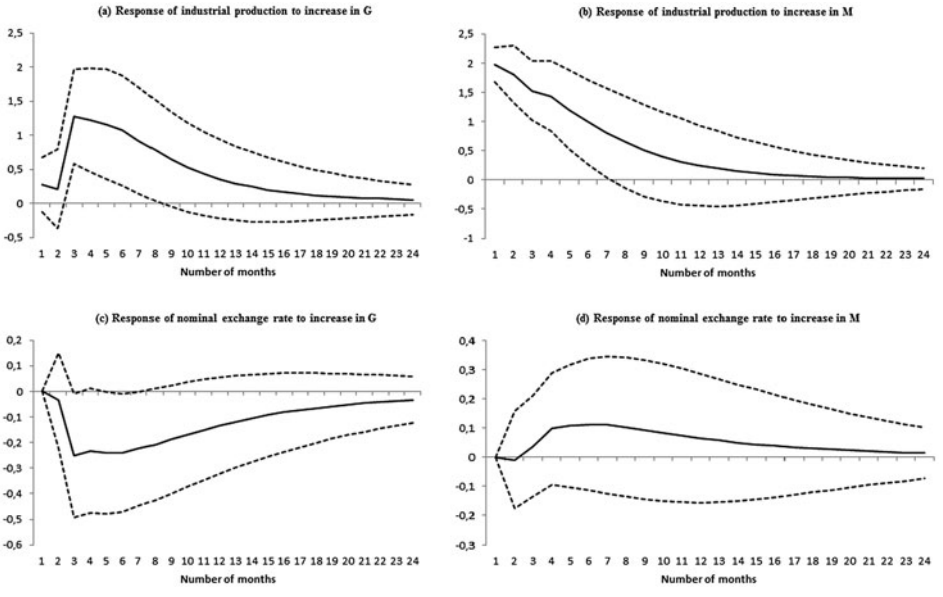

Figure 3. Effects of expansionary policies on economic activity and nominal exchange rate.
Note: dashed lines represent 95% confidence interval.
Source: Authors' calculation.

bottom right graph. However, on the 95% confidence level these results are not significant, while on the 68% confidence level results are significant from third to seventh month after the shock.

Although the results are based on the stable model with no autocorrelation and heteroskedasticity and the results are in line with the predictions of the Mundell-Fleming model, from the methodological point of view it is necessary to warn about some restrictions that can significantly affect the results of the model. Firstly, due to the unavailability of longer time series, the sample on which the analysis is based is quite small. Secondly, although we used a *dummy* variable, there is a possibility that the conclusions of the model would be different if the analysis was carried out in the period before the crisis (for example, it has been shown in the literature that, during the crisis, the effects of the fiscal policy were significantly stronger and almost in every case positive). Thirdly, due to the limited size of the sample, we could not directly observe the effects of some other relevant variables as interest rate, net exports, public debt, credit default swap (CDS), foreign demand etc. Furthermore, different seasonally adjustment methods or implementation of variables in different format also can have an influence on the results. Finally, again because of the limited length of time series, it was not possible to conduct the robustness test by again estimating the model on two separate samples, i.e. on total sample divided into two equal parts.

6. Conclusion

Our results indicate that only coordinated monetary and fiscal expansion could stimulate economic growth in Croatia without endangering exchange rate stability, as both expansionary policies have positive effects on economic activity while the effects on the

nominal exchange rate are of the opposite direction. These results are in line with the theoretical framework of the Mundell-Fleming model, where coordinated expansion of monetary and fiscal policy leads to the increase of national income, while keeping interest rate and thus exchange rate stable. Although these results can be encouraging in the recessionary conditions, there are important limitations to such coordinated action.

As for the fiscal policy, it should be noted that the Croatian fiscal situation can be described as unstable given the size of the deficit, public debt, credit risk and interest expenditures so any expansionary measures would lead to increased fiscal uncertainty and instability, thus putting additional pressure on financing costs and government credibility. Moreover, Croatia is the first EU country that entered the Excessive Deficit Procedure in the first year of the membership so the fiscal consolidation is a *conditio sina qua non* for absorption of EU funds which are seen as the most important source of public investments financing in following years So, in current conditions, fiscal policy is seriously limited but our results can be seen as a call for policymakers to implement more prudent fiscal policy in the expansionary phase of the business cycle so they could stimulate growth in future economic slowdowns.

In the monetary policy context, it should be pointed out that the monetary transmission mechanism in Croatia is specific and, in current institutional framework, the national bank cannot directly stimulate economic growth. Also, many indicators show that previous monetary policy measures (reduction and suspension of various reserve requirements) resulted with abundant liquidity in banking sector but credit growth is still negative, which implies that Croatian firms and households are still in the phase of deleveraging and bank surveys show that the credit growth is still subdued by low demand. So we can conclude that the manoeuvring space of Croatian national bank is also limited and we expect the monetary policymakers to mostly focus on its active role on the foreign exchange market and manage exchange rate fluctuations, especially after the Croatian entry to ERM II mechanism.

Thus, with pronounced fiscal instability and limited scope of monetary policy, Croatian policymakers should put more effort on the structural reforms front, as many indicators show that business climate, product and labour market rigidities and institutional (administrational) quality are one of the main constraints to economic growth in Croatia. Also, structural reforms could mitigate negative effects of necessary fiscal consolidation and induce stronger demand for bank loans in the private sector, thus enabling monetary sector to indirectly stimulate economic growth.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

University of Rijeka [Grant Number 13.02.1.2.02.]; Croatian Scienece Foundation [Grant Number IP-2013-11-8174].

Notes

1. In the Croatian Government's *Guidelines for Economic and Fiscal Policy 2013–2015* macroeconomic and economic stability are specified as main goals of economic policy, which primarily involve low inflation, economic growth and low unemployment (Ministry of Finance, 2012). Law on Croatian national bank specifies price stability as the main goal of CNB.

2. Currency structure of broad money (M_4) in the period between 1996 and 2012 indicates that the share of foreign currency deposits has never dropped below 40%, while during the post-2008 recession this share grew above 60% in December 2012.
3. Two governments and two prime ministers and even four ministers of finance have changed in Croatia in period from 2008 till today.
4. Deterministic variables are excluded from notation for simplicity.

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Appendix 1.

Table A.1. VAR Stability Condition Check.

Root	Modulus
0.899127	0.899127
0.737156 – 0.077767i	0.741246
0.737156 + 0.077767i	0.741246
0.631462	0.631462
-0.226946 – 0.290495i	0.368635
-0.226946 + 0.290495i	0.368635
0.026629 – 0.118330i	0.121289
0.026629 + 0.118330i	0.121289
No root lies outside the unit circle.	
VAR satisfies the stability condition.	

Source: Authors' calculation.

Table A.2. VAR Residual Serial Correlation LM Test.

Lags	LM-Stat	Prob
1	20.87475	0.1834
2	15.06459	0.5199
3	17.75469	0.3385
4	13.13327	0.6630
5	13.89763	0.6063
6	12.27971	0.7245
7	17.81218	0.3350
8	17.74140	0.3393
9	22.06126	0.1412
10	22.59118	0.1251

Source: Authors' calculation.

Table A.3. VAR Residual Heteroskedasticity Test.

Joint test:		
Chi-sq	df	Prob.
212.8777	210	0.4316

Source: Authors' calculation.

Table A.4. VAR Residual Normality Test.

Component	Jarque-Bera	df	Prob.
1	0.103930	2	0.9494
2	3.964381	2	0.1378
3	3.497695	2	0.1740
4	4.307549	2	0.1160
Joint	11.87356	8	0.1569

Source: Authors' calculation.