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Tax policy and labour market in Croatia: effects of tax wedge on employment

Milan Deskar-Škrbić[a], Saša Drezgić[b] and Hrvoje Šimović[c]

[a]Economic Research Department, Erste & Steiermarkische Bank, Zagreb, Croatia; [b]Faculty of Economics Rijeka, University of Rijeka, Rijeka, Croatia; [c]Faculty of Economics and Business Zagreb, University of Zagreb, Zagreb, Croatia

ABSTRACT

In this paper we empirically test the importance and the effects of labour taxation on employment in Croatia. The motivation for this analytical inquiry stems from the fact that Croatia is one of the countries with the lowest employment rates in the European Union while at the same time it has relatively high labour tax burden compared to peers and ranks among the countries with most negative perceived effects of taxation on incentives to work. As fiscal policy is the main economic policy instrument in Croatia, it is important to analyse whether fiscal measures can directly affect labour market performance. Our results show that tax policy has significant effect on employment in Croatia which has important policy implications.

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Tax policy; labour market; Croatia; V.A.R. model

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1. Introduction

Croatia ranks near the bottom of the European Union countries with respect to employment rate (percentage of labour force that is employed). Such an unfavourable rank cannot be attributed to the effects of prolonged recession from 2009 to 2014, since Croatia's position worsened only slightly when compared to pre-2009 period. According to Eurostat data, after the peak of the business cycle in 2008, employment rate (20–64 years) in Croatia stood at 64.9%, which has put the country at the fifth place from the bottom of the scale. Meanwhile, in 2016, the figure stood at 61.4% and Croatia was positioned second from the bottom of the scale.

Activity of country's population on the labour market is determined by various demographic and socio-economic factors (see for example Aarson et al. (2014) and Nestić and Tomić, (2017)). However, theoretical models and empirical literature indicate that one of the important factors lays also in the domain of fiscal policy in the form of tax burden on labour income. In international comparisons, countries with higher tax burden on labour tend to have lower employment rates as reservation wages are higher and people are less motivated to enter employment (income–leisure trade off).

CONTACT Milan Deskar-Škrbić mdskrbic@erstebank.com

In this context it is important to emphasise that there are various papers indicating that labour taxation in Croatia is relatively excessive and/or that there is still room for additional reduction of tax burden which would be beneficial for labour market. For example, Blažić (2006) points out that Croatia has high tax burden (especially due to social contributions), while Šeparović (2009) shows that tax wedge in Croatia is above Organisation for Economic Co-operation and Development (O.E.C.D.) average and concludes that the tax wedge in Croatia is still quite large and that work should be done to reduce it. Grdović Gnip and Tomić (2010) show that Croatia is clustered among E.U. countries with high taxation. Deskar-Škrbić and Šimović (2014) also show that Croatia belongs to the group of countries with high tax wedges. Blažić and Trošelj (2012) warn that adjusted methodology in tax wedge calculation puts Croatia lower on the scale (which was confirmed also in papers presented in Urban (2016)), but that this shouldn't discourage policy makers to continue to reduce labour taxation. In addition, according to the latest Global Competitiveness Report, Croatia is ranked 134/138 countries in the world by the indicator 'effects of taxation on incentives to work' (World Economic Forum, 2016).

Thus, in this paper we analyse the effects of labour taxation, in terms of tax wedge, on employment in Croatia from the first quarter of 2000 to the fourth quarter of 2016. We use small-scale vector autoregressive model (V.A.R.), which is a novelty in the literature as most of the researches on similar topic are based on panel data approach or cluster analysis. The relatively short sample period is determined by data availability, but it includes boom (2000–2008), bust (2009–2014) and recovery (2015–2016) phases of the business cycle, which allows us to control our results for the effects of economic environment on the labour market.

The paper is structured as follows. After the Introduction at the beginning, in the second part of the paper we present and discuss a theoretical framework of the analysis in terms of imperfect labour market wage setting, price setting (W.S.-P.S.) model. Next, we present a brief literature review, mostly focusing on the research that includes Croatia (to make our results more comparable). In the fourth part we present empirical approach and data and discuss our results. The paper ends with the Conclusion where we emphasise policy implications based on the results.

2. Theoretical framework: W.S.-P.S. model with a tax wedge

In macroeconomics there are two common theoretical approaches to labour market analysis. The first is based on the assumption of the classical (competitive) labour market, while the second is based on imperfect competition model of labour markets, with frictions in the job creation process, wage bargaining or imperfect information (for the analysis of classic labour market see Gartner (2006) and for imperfect labour market see Carlin and Soskice (2006)).

The institutional framework and structure of the Croatian labour market are closer to the framework of imperfect markets as they are characterised by relatively low overall flexibility, a high level of employment protection, barriers to entry, a complicated firing practice, duality, bargaining etc. (Kunovac I Pufnik 2015). Thus, in this paper we will briefly present the effects of taxation on the labour market in most commonly used theoretical models of imperfect labour market – W.S.-P.S.

The W.S.-P.S. model is based on the assumption that prices and wages in the economy are determined by the bargaining process. Employers set producer prices based on the

level of wages with addition of a mark-up, while employees bargain on net wages with their bargaining power depending on the level of employment and institutional characteristics of the labour market (minimum wage, labour protection etc.). A W.S.-P.S. model with a tax wedge is based on the following logic (notation is based on Tica (2015)).

Consumer prices P_c in the economy are defined as producer prices P adjusted for indirect tax rate T_v, such as value added tax (V.A.T.), which is presented in Equation 1:

$$P_c = \left(1 + T_v\right)P \tag{1}$$

Producer prices are determined by wages W increased by a mark-up μ and all direct taxes (income tax, social contributions paid by the employees and by the employers) labelled as T_d. In other words, producer prices are determined by gross wages and a mark-up, which is shown in Equation 2.

Price setting curve:

$$P = (1 + \mu)W^{Gross} = (1 + \mu)\left(1 + T_d\right)W \tag{2}$$

By combining Equations 1 and 2 we can get an expression for the real wage which employers 'leave' to the employees (Equation 3).

$$\frac{W}{P_c} = \frac{1}{(1 + \mu)\left(1 + T_d\right)\left(1 + T_v\right)} \tag{3}$$

Tax wedge is the difference between the real net wage paid to employees $\frac{W}{P_c}$ (real consumption wage) and real gross waged paid by the employers (real product wage) $\frac{W\left(1+T_d\right)}{P}$. Gross wages are higher than net wages by the amount of total direct taxes, while difference in prices comes from indirect taxes.

To complete the model, we have to define the wage setting curve. As mentioned, employees are bargaining on the real net wage, $\frac{W}{P_c}$ which depends on the factors mentioned above: institutional characteristics of the labour market z, and the level of employment N (α is the elasticity), which is presented in Equation 4.

Wage setting curve:

$$\frac{W}{P_c} = f(N, z) = z + \alpha N \tag{4}$$

By combining Equations 2 and 3 we can get the expression for the level of employment (Equation 5).

$$N = \frac{1}{(1 + \mu)\left(1 + T_d\right)\left(1 + T_v\right)\alpha} - \frac{z}{\alpha} \tag{5}$$

Equation 5 shows that the level of employment depends on institutional characteristics of the labour market, level of mark-up and effects of taxation. In this paper we focus on the effect of labour taxation, so based on Equation 5 we can conclude that increase of labour taxes (thus the tax wedge) has negative effects on the level of employment in an imperfect

labour market (such as that in Croatia). This is also our main hypothesis in the empirical part of the paper.

3. A brief literature review on the effects of labour taxation on labour market outcomes in Croatia

Although the effects of labour taxation on labour market indicators are subject to many international studies which include various countries and regions, due to comparability of our results, in this paper we present those focused on Croatia (for more extensive literature review see Dolenc et al. (2011)).

The importance of the discussion on the effects of tax burden on labour market in Croatia was recognised early. Nestić (1998) compares Croatia to transitional peers and concludes that the social security burden at that time was relatively high which partially contributed to the rise of the informal sector of the economy (reducing formal employment). Also, the author shows that tax wedge (then standing at around 45.2%) was extremely high and was discouraging for both employers and employees. Obadić (2004) concludes that Croatia has relatively high gross wages compared to its peers and to the level of productivity due to employees' social contributions, which hurts the competitiveness of the labour market (and thus employment). Kesner Škreb (2007) also emphasises the importance of tax burden for labour costs and consequently competitiveness and proposes its reduction, mostly through cuts in social contributions.

Šeparović (2009) uses cluster analysis and shows that there is a relationship between the size of tax wedge and unemployment and concludes that Croatia is a country with a high tax wedge and a high unemployment rate. This leads the author to the conclusion that the reduction of tax wedge could lead to the fall in the unemployment rate. Grdović Gnip and Tomić (2010) confirm these results, also using cluster analysis, and show that Croatia belongs to a group of countries with higher tax burden and higher unemployment rate (lower employment rate). Dolenc et al. (2011) use panel analysis for 39 countries, including Croatia, and show that tax wedge has a positive and statistically significant effect on unemployment rate (increase in tax wedge increases unemployment rate) in all model specifications. In addition, the authors point out that the results of the analysis with employment rate as the dependent variable showed mildly negative but not statistically significant effect of tax wedge.

4. Methodology, data and results

Our methodological approach is based on vector auto regression as in our view V.A.R. models can be very useful for the analysis of proposed research problem. Firstly, V.A.R. models treat all variables as endogenous which is suitable for the analysis of the labour markets as performance and main determinants of labour market are strongly inter-related and it is hard to point out some purely exogenous factors. Secondly, inclusion of lags in the analysis enables us to capture the effect of persistency on the labour market and nature of fiscal policy where implementation takes time so changes in policy instruments affect 'policy targets' with a lag. Finally, results of V.A.R. models in terms of impulse responses directly show direction, strength and statistical significance of the effects of policy shocks.

We base our analysis on a bivariate V.A.R. model:

$$X_t = \alpha + \sum_{i=1}^{p} A_i X_{t-i} + u_t, \tag{6}$$

Vector X_t includes annual changes of a cyclically adjusted level of employment ($g_{E,t}^{CA}$) and tax wedge ($g_{TW,t}$). Vector u_t represents the vector of innovations of the this reduced form V.A.R. model, where $u_t \sim (0, \sum_u)$. The number of time lags is set to 2 based on Akaike information criteria, while a greater number of lags is not desirable also due to the relatively small sample. Model adequacy tests (stability, autocorrelation and heteroscedasticity) are shown in Appendix 1, and they indicate that our model is suitable for the analysis.

As labour market developments are highly correlated to the phase of business cycle we cyclically-adjusted the annual change in employment by regressing it on the real gross domestic product (G.D.P.) growth rate and taking the residuals:

$$g_E = \beta_0 + \beta_1 g + \varepsilon_t, \tag{7.1}$$

$$g_E^{CA} = g_E - \hat{g}_E \tag{7.2}$$

In this way we can focus on the analysis of 'structural' employment which is mostly dependent on supply-side shocks, such as tax policy shocks (cyclical part of employment is driven by demand-side policies). We chose employment as the key labour market indicator since unemployment (rate), which is mostly used in other research, is strongly affected by the effects of migration (more pronounced in Croatia since 2013), stricter rules of registration and deletion from the Employment Bureau (notable changes in 2014) and number of discouraged workers (also on rise in recessions).

Tax wedge calculation was based on Grdovic Gnip and Tomic (2010) and Deskar-Škrbić and Šimović (2014), where it is defined as income tax + all social security contributions + all additional income levies divided by total labour costs. Gross wage is defined by the O.E.C.D. methodology in sectors B-N (According to International Standard Industrial Classification sectors B-N include B: Mining and quarrying; C: Manufacturing; D: Electricity, gas, steam and air conditioning supply; E: Water supply; sewerage, waste management and remediation activities; F: Construction; G: Wholesale and retail trade; repair of motor vehicles and motorcycles; H: Transportation and storage; I: Accommodation and food service activities; J: Information and communication; K: Financial and insurance activities; L: Real estate activities; M: Professional, scientific and technical activities; N: Administrative and support service activities.) (Isic Rev.4). Although we acknowledge methodological issues pointed out in Blažić and Trošelj (2012), we decided to include all social contributions (for discussion on this matter see Deskar-Škrbić and Šimović (2014)).

Figure 1 shows dynamics of original growth rate of employment, cyclically adjusted growth rate of employment and annual changes in tax wedge (source for all variables is the Croatian Bureau of Statistics).

The biggest changes in tax wedge were recorded in early 2000s (firstly increase of personal allowance, reduction of income tax rates and cut in contribution for pensions on salary in 2000 and 2001, effects of pension system reform in 2002, increase of personal allowance in 2003), in 2009 and 2011 (introduction and abolition of 'crisis tax'), 2012 (increase of personal allowance and cut in healthcare contribution), 2014 (increase of healthcare contribution to pre-2012 level) and 2015 (broad income tax reform). Detailed discussion on these changes is available in Grdovic Gnip and Tomic (2010) and Šimović and Deskar-Škrbić (2015).

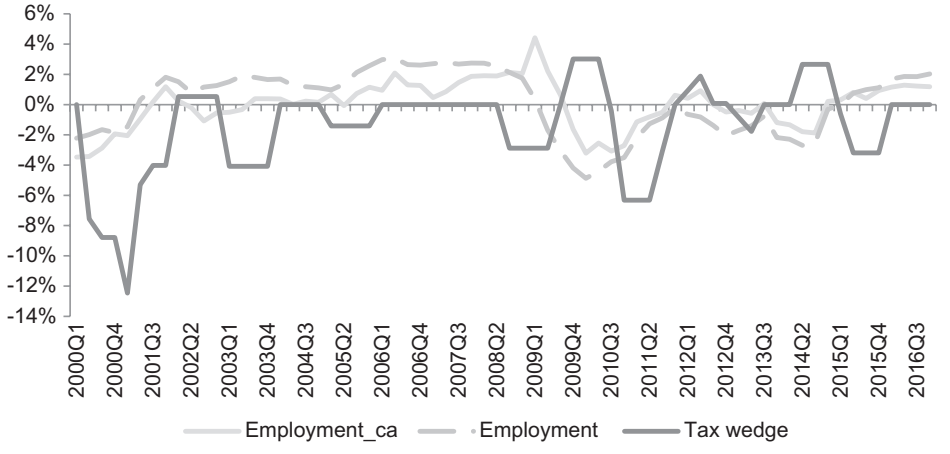

Figure 1. Annual changes in employment, cyclically adjusted employment and tax wedge. Source: Authors' calculations.

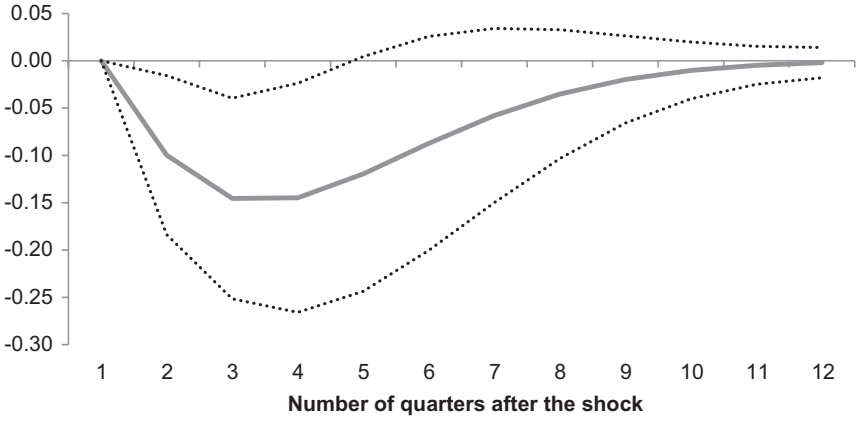

Figure 2. Effects of a one standard deviation shock in a tax wedge on cyclically adjusted employment (impulse response) 2000–2016. Source: Authors' calculations.

Have these changes affected employment in the analysed period? Figure 2 shows impulse response of a one standard deviation shock in tax wedge on cyclically adjusted employment.

It can be seen that this effect is negative and that it is statistically significant in five periods after the shock. This result suggests that an increase in tax wedge reduces employment and that labour tax policy has a statistically significant effect on the employment level. This is in line with theoretical assumptions and the findings of other research presented in the literature review.

Although these results are based on the stable model with no autocorrelation and heteroscedasticity, from the methodological point of view it is necessary to emphasise some limitations that can significantly affect the results of the model. Firstly, due to the unavailability of a longer measurement period (G.D.P. growth rate is available since 2000), the sample on which this analysis is based is relatively small. Secondly, economic shock and policy shock in 2009 (strong fall of the economy and introduction of 'crisis tax') can be seen as outliers which could have affected results. Thirdly, due to the unavailability of data and the limited

size of the sample, we could not directly observe the effects of some other relevant variables such as employment protection legislation, minimum wage etc. Furthermore, introduction of variables in different formats 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 check by estimating the model on two separate, shorter samples.

5. Conclusions and policy recommendations

Taxation can significantly affect employment trends in the economy. Excessive taxation can disturb the proper functioning of labour market by distorting incentives for work. Also, high tax burdens discourage employers to hire new workers, boost incentives for reduction of employment in recessions and stimulate employment in informal sector of the economy. For this reason, emphasis of tax policy should increasingly be put on finding those elements of the tax system which cause biggest distortions and bring them to the minimum. It is generally recommended to reduce the total tax burden in the economy, disperse the tax burden from the employers and workers to other tax forms with broader tax base (such as consumption) and increase flexibility on the labour market.

These general recommendations are also important for Croatia as in this paper we showed that labour taxation, through the tax wedge, has a statistically significant effect on employment. More precisely, our results indicate that increases in tax wedge have statistically significant negative effects on the level of employment, which is in line with theoretical assumptions and findings of other research on the effects of taxation on the Croatian labour market. In recent years we could see that policy makers have put more efforts in the reduction of tax wedge (tax reform of minister Lalovac in 2015 and of minister Maric in 2017).

However, general public and policy makers in Croatia are still mostly focused on income tax. This can be seen from the frequent changes in personal income tax. In this context it should be stressed that income tax is a complex tax form, and that any change causes a number of consequences not only in the fiscal and distribution contexts but also in the segments of fiscal equalisation and financing of local government units. Thus, policy makers in Croatia should continue to reduce the tax wedge in Croatia but the focus should be on social contributions. However, this path seems more challenging as more pronounced cuts in social contributions have to be accompanied by structural reforms in healthcare, social security, and pension systems.

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Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Milan Deskar-Škrbić http://orcid.org/0000-0002-7611-2071
Hrvoje Šimović http://orcid.org/0000-0002-4040-0899

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Appendix 1.

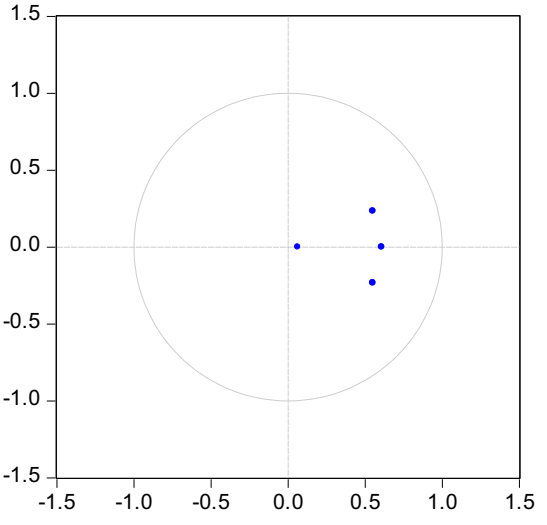

Figure A1. V.A.R. stability test. Source: Authors' calculations.

Table A1. V.A.R. Residual Serial Correlation LM Tests.

Null Hypothesis: no serial correlation at lag order h
Date: 06/12/17 Time: 09:47
Sample: 2000Q1 2016Q4
Included observations: 66

Lags	LM-Stat	Prob
1	9.731357	0.0552
2	6.299316	0.1779
3	2.267795	0.6866
4	18.10535	0.0912
5	4.708091	0.3186
6	4.561696	0.3353
7	5.011040	0.2862
8	6.275262	0.1795
9	6.478210	0.1662
10	5.118889	0.2753
11	6.111428	0.1910
12	6.742210	0.1502

Probs from chi-square with 4 df.

Source: Authors' calculations.

Table A2. V.A.R. Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares).

Date: 06/12/17 Time: 09:47
Sample: 2000Q1 2016Q4
Included observations: 66

Joint test:

Chi-sq	df	Prob.
35.82111	24	0.0571

Individual components:

Dependent	R-squared	F(8,57)	Prob.	Chi-sq(8)	Prob.
res1*res1	0.179907	1.563044	0.1565	11.87389	0.1569
res2*res2	0.235273	2.192054	0.0415	15.52804	0.0497
res2*res1	0.163438	1.391997	0.2198	10.78688	0.2141

Source: Authors' calculations.