

Macroeconomic effects of VAT changes in a small open economy: a narrative approach*

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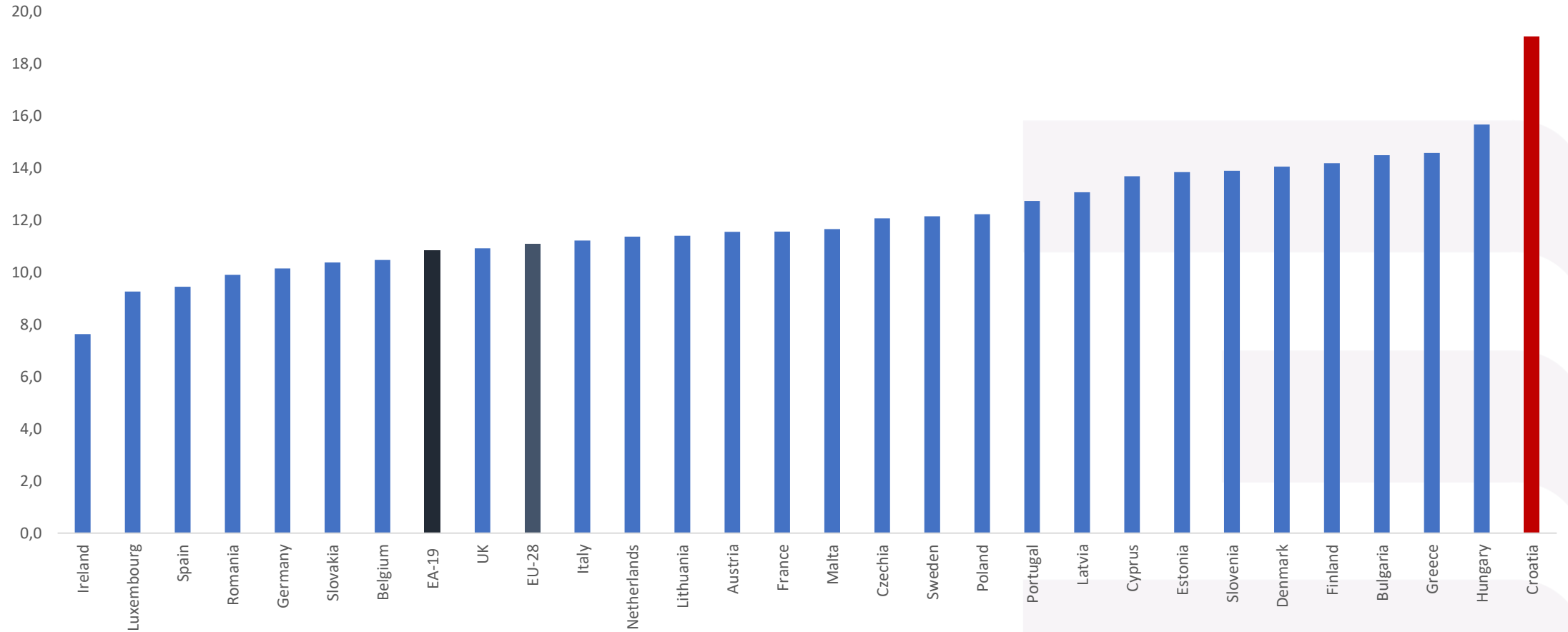


Motivation

- VAT is the **most important tax form** in Croatia (consumption based tax system)
- frequent **changes** in VAT system (standard rates, reduced rates, groups of products etc.)
- **macroeconomic effects** of VAT
 - VAT affects domestic demand (private consumption) – **tax multiplier**
 - however, this depends on the strength of the **pass through effect** from VAT changes to prices
- in the analysis of macroeconomic effects of tax changes it is important to identify exogenous, discretionary tax changes → **narrative approach + zero and sign restrictions**
- Croatia is a small open economy; external shocks play important role in Croatian economy → **small open economy VAR model**

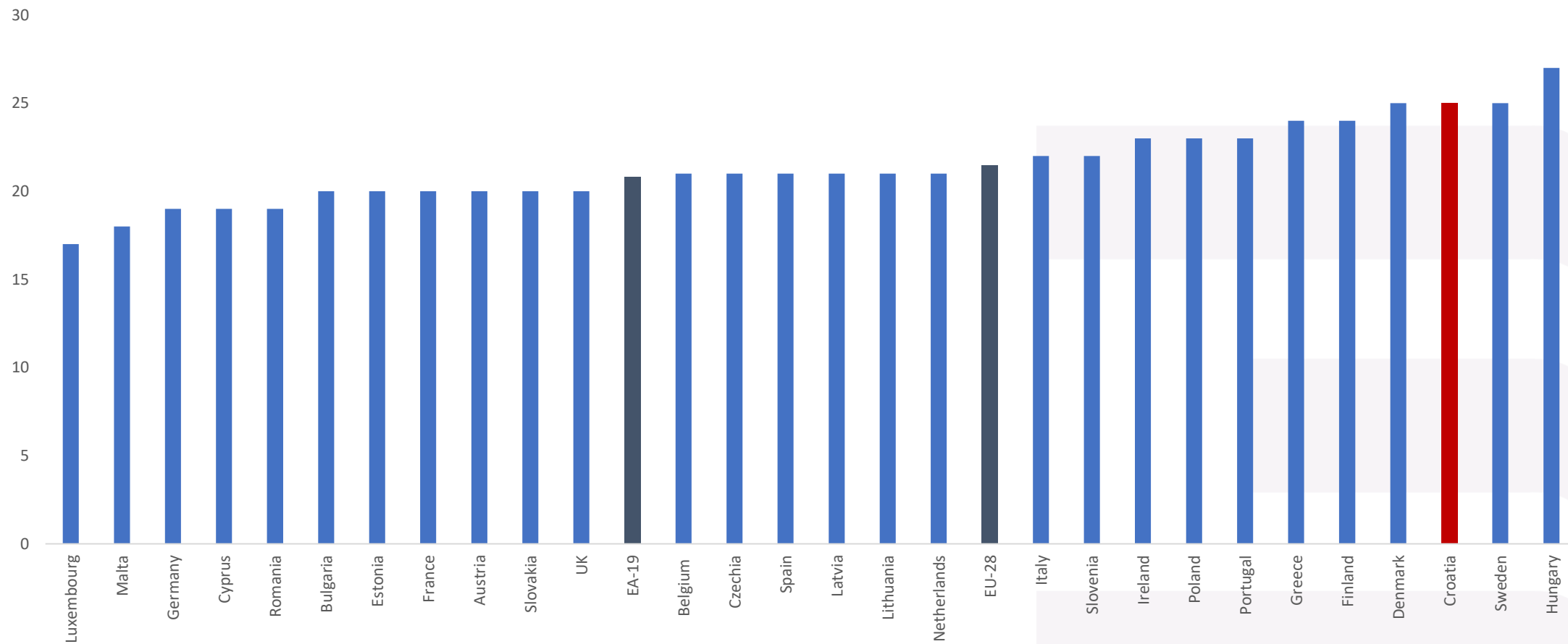


Consumption taxes in the EU (% of GDP)





Standard VAT rates in the EU



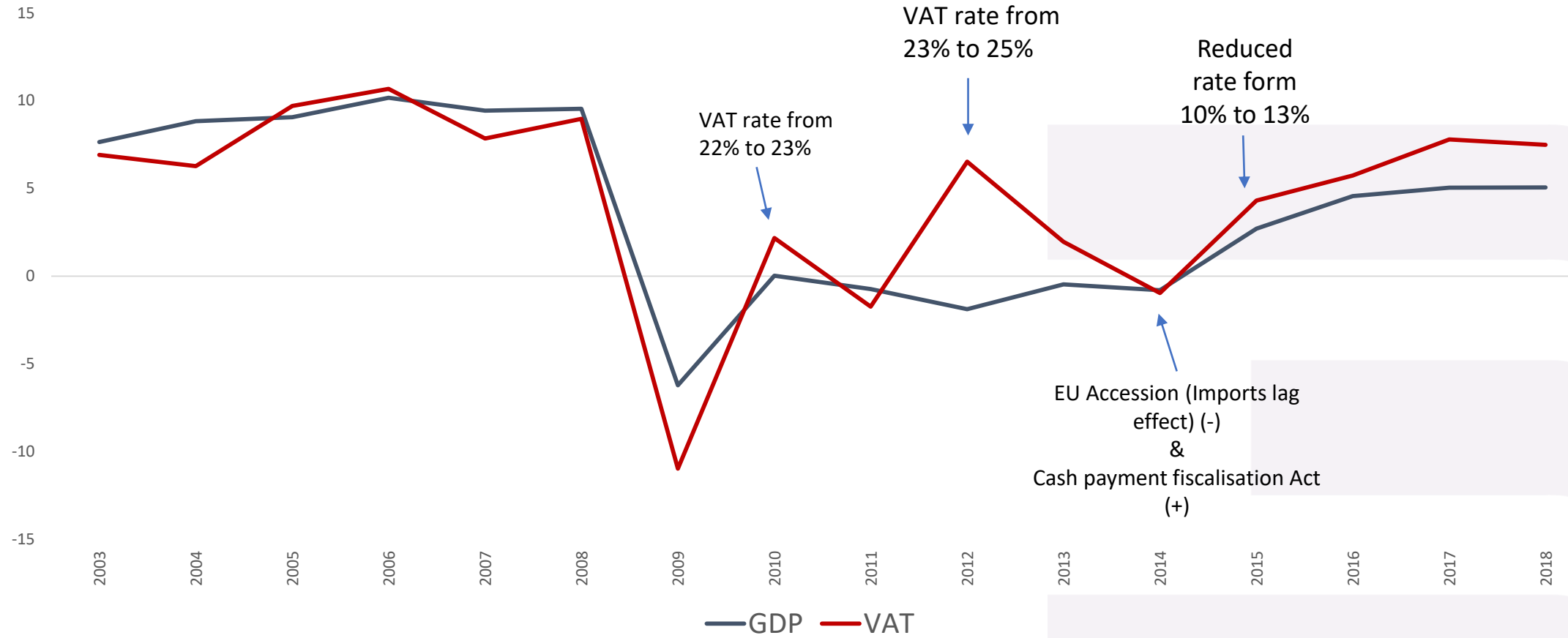


Identification of tax shocks

- Consistent estimation of the effects of taxes on economic growth through tax multiplier is complicated by the **endogenous response** of taxation policy to the phase of business cycle
- Also, changes in taxes are likely to contemporaneously affect GDP but commonly used tax variables such as tax revenues are also contemporaneously driven by GDP – **simultaneity problem**
- Inadequate estimation procedure would lead to **overestimated size of tax multipliers or wrong sign of tax multiplier**
- To tackle this problem researchers use two approaches to the identification of **exogenous tax policy shocks**
 - structural VAR models (e.g. Blanchard and Perotti (2002))
 - narrative approach (Romer and Romer (2010))

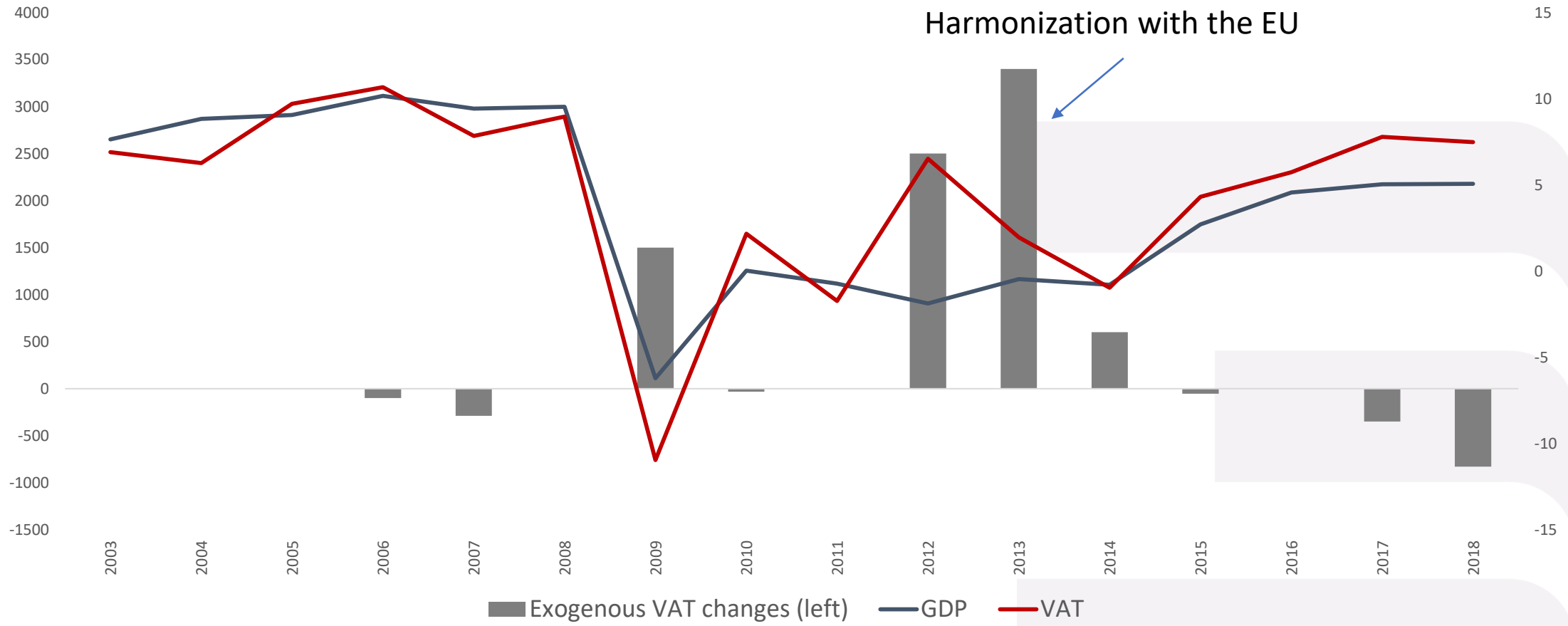


VAT revenues – pronounced cyclical component





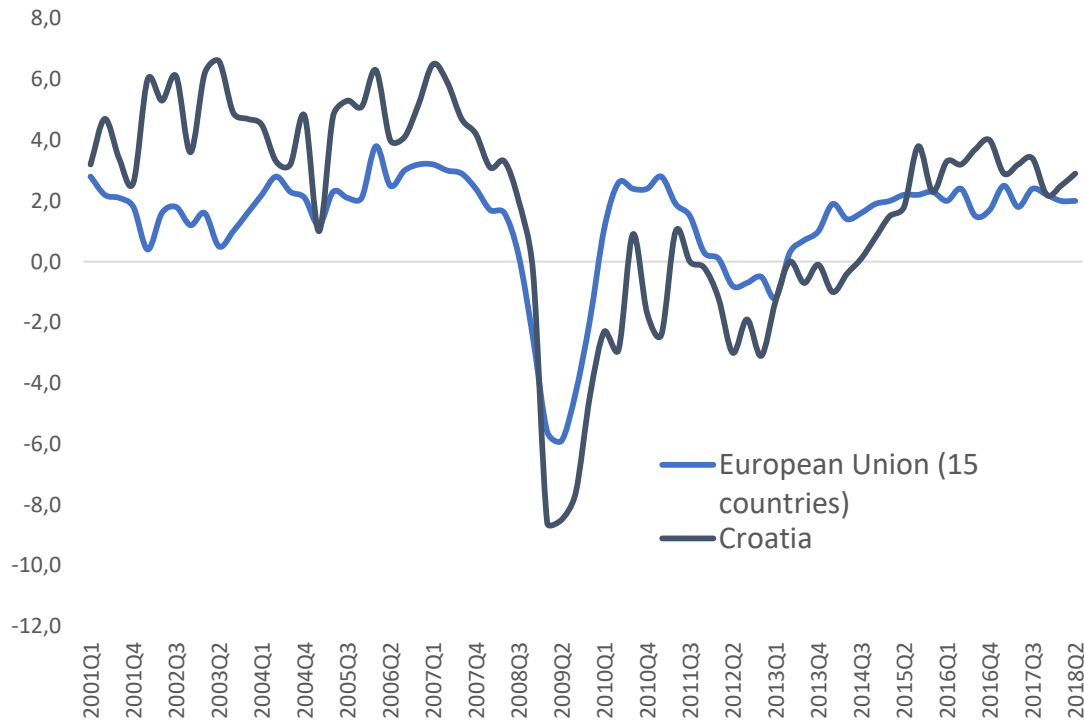
Legislative changes in VAT – exogenous tax „shocks”





Openess of Croatian economy

Real growth rates



- **external shocks are dominant drivers** of business cycle movements in Croatia (Kunovac and Jovičić (2015), Palić, Dumičić and Šprajac (2015), Deskar-Škrbić, Kotarac and Kunovac (2019))
- Negligence of the role of external shocks can lead to omitted variable bias problem – **overestimated effects of tax shocks**



Methodology

Variable/Shock	HR AD	HR AS	HR TAX	EA AD	EA AS
HR GDP	+	+	-	?	?
HR CPI	+	-	+	?	?
HR TAX	0	0	0	0	0
EA GDP	0	0	0	+	+
EA CPI	0	0	0	+	-

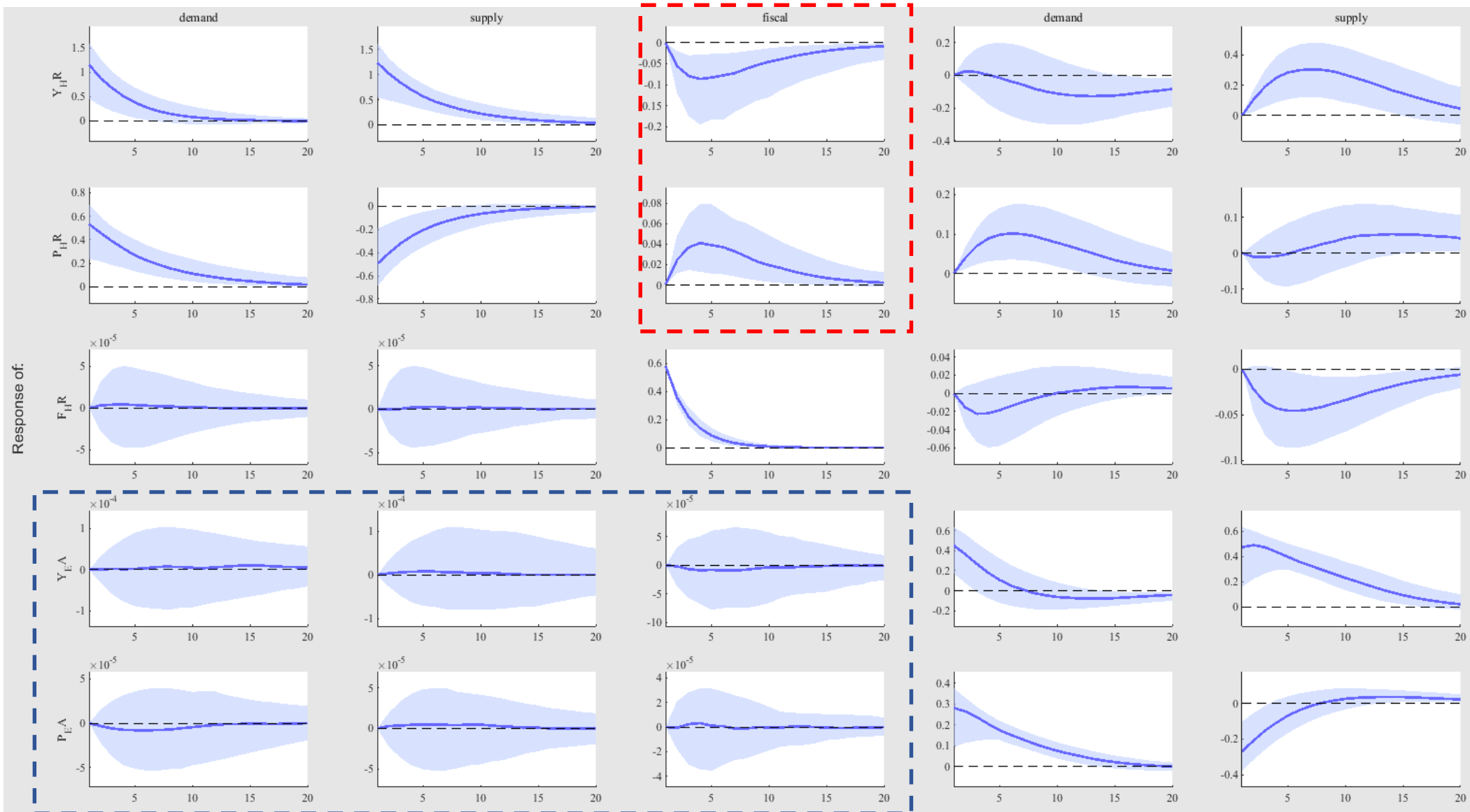
- **small open economy BVAR** model with tax shocks identified through **sign and zero restrictions**, based on **narrative** time series of VAT changes
- sample: 2003q4 – 2018q4
- **two blocks** (block exogeneity assumption)
 - domestic: GDP, inflation, VAT
 - external: GDP, inflation
- identification strategy

Results



domestic shocks

external shocks



Domestic shocks cannot affect external variables in both first period and other periods



Conclusion and contributions

- to obtain reliable estimates of macroeconomic effects of VAT changes one needs to identify **discretionary, exogenous VAT shocks**
- also, in small open economies it is important to model the effects of **external shocks** on domestic economy
- results in this paper indicate that exogenous VAT changes have **statistically significant macroeconomic effects**:
 - exogenous rise in VAT → fall of GDP (**negative tax multiplier**)
 - exogenous rise in VAT → rise in prices (evidence of **pass through effect**)
- contributions to existing literature - first analysis of macroeconomic effects of VAT changes in Croatia based:
 - on a constructed series of **narrative changes** in VAT
 - on structural BVAR model with **sign and zero restrictions**
 - on an **open economy framework**



Thank you!

