

# The Effects of Tax and Transfer Shocks on Output: Reassessing the German case

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## Motivation

- How large is the revenue multiplier?
- Identification problem (endogeneity of the budget to business cycle fluctuations)
  - Top-down approach (Blanchard and Perotti, 2002; Tenhofen et al., 2010) →  $m \approx 0 - 1$
  - Bottom-up approach (Romer and Romer, 2010; Hayo and Uhl, 2013) →  $m \approx 2 - 3$
- How to reconcile these findings?

## Recent Attempts to Reconciliation

- Favero and Giavazzi (2012) (US), estimation of Romer and Romer (2010)-identification in a VAR instead of ARDL.  
→  $m \approx 0 - 1$
- However, Hayo and Uhl (2013) (GER), Cloyne (2013) (UK), estimation within a VAR →  $m \approx 2 - 3$
- Mertens and Ravn (2012) (US) use narrative tax shocks as proxy for structural shocks in the Blanchard and Perotti (2002)-approach →  $m \approx 2 - 3$
- Perotti (2012) (US) compares specifications →  $m \approx 1 - 2$

→ still no consensus

## Our Argument

- Blanchard and Perotti (2002); Tenhofen et al. (2010) estimate multipliers of *taxes + social security contributions – transfers*
- Romer and Romer (2010) only consider *taxes + social security tax*, Hayo and Uhl (2013) *taxes only*  
→ different underlying fiscal measures could account for the different effects

## Moreover, ...

- Social security especially important in Germany, accounts for half of the overall budget (including statutory pension and health care system)
- Changes to effective contribution rates and benefits most often by law

## Contribution of the Paper

- Construct a series of social security and transfer shocks, augmenting the Hayo and Uhl (2013) tax shock series for Germany
- Estimate net revenue multipliers for Germany with a rich narrative data set

## Constructing the Shock Series

- 1970q1-2007q4
- Tax shock series reconstructed from Hayo and Uhl (2013) (Finanzberichte)
- Social Security Contributions and Transfers:
  - Chronicles from Federal Ministry of Labour and Social Affairs, German Statutory Pension Insurance Scheme, Sozialpolitische Chronik
  - Historical records of draft legislations and legislative texts from Bundestag (Federal Parliament) and Bundesrat (Federal Council)
    - Provide timing, motivation and expected amount of full-year budgetary effect of the measure
- Distinguish exogenous from endogenous changes according to motivation given in the draft

Figure 1 : Exogenous Shocks to Taxes and Social Security System at Implementation Date

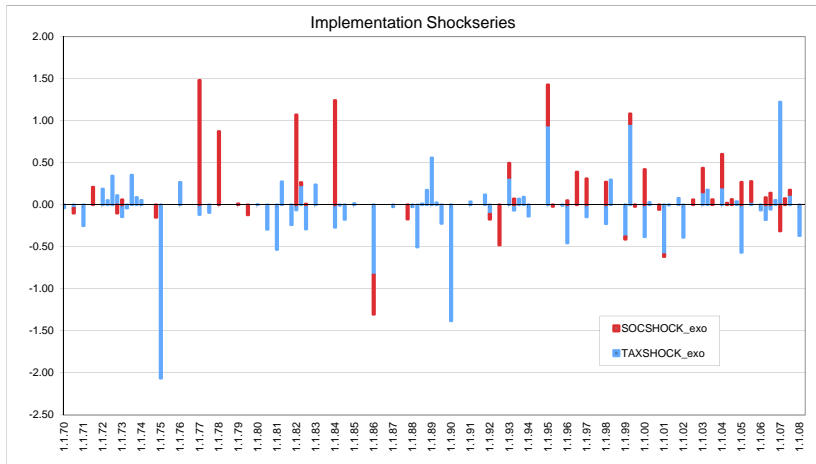


Table 1 : Predictability of the shock series - F-test p-values

lags	TAXSHOCK		SOCSHOCK	
	4	8	4	8
GDP	0.1855	0.5533	0.1811	0.1577
INFL	0.7583	0.7396	0.9662	0.512
G	0.9584	0.9707	0.4952	0.7488
T	0.6332	0.3738	0.9783	0.9423



## VAR model

$$\Gamma(L)X_t = v + \mathbf{A}(L)d_t + \varepsilon_t \quad (1)$$

$$X_t = [g_t \quad \tau_t \quad y_t \quad p_t \quad i_t] \quad (2)$$

$\Gamma(L)$  = 4th-order lag polynomial of coefficients of endogenous variables

$g_t$  = log real per capita general gov't spending (including transfers)

$\tau_t$  = log real per capita taxes + social security contributions

$y_t$  = log real per capita GDP

$p_t$  = log GDP deflator

$i_t$  = short-term interest rate

(All variables in first differences)

$v$  = constant and re-unification dummy

$d_t$  = exogenous revenue shock series

$\mathbf{A}(L)$  = 8-th order lag polynomial of coefficients of shock series

Figure 2 : IRFs of Endogenous Variables to Exogenous Tax Shock

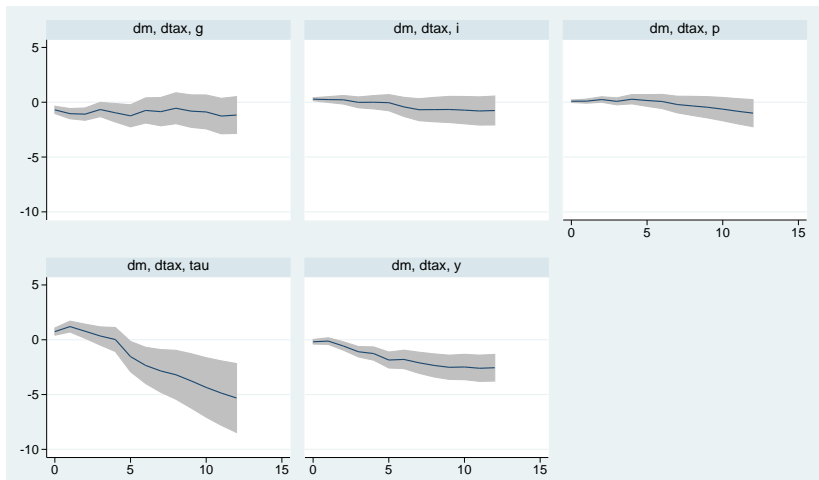


Figure 3 : IRFs of Endogenous Variables to Exogenous Net Revenue Shock

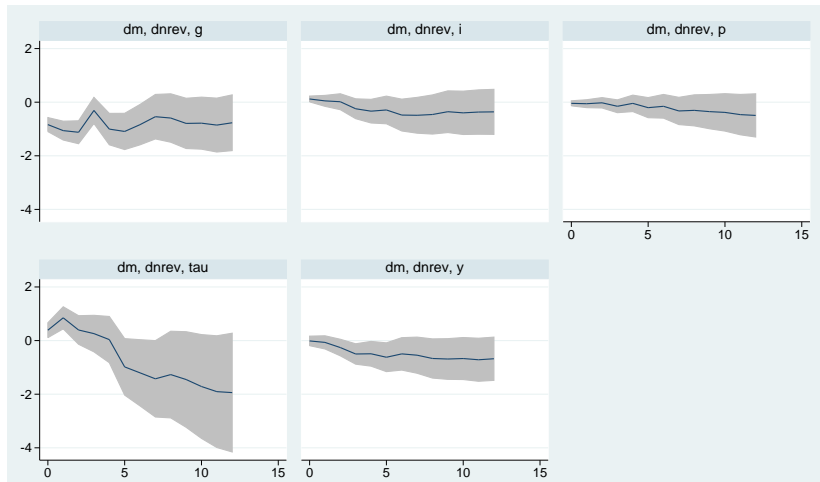
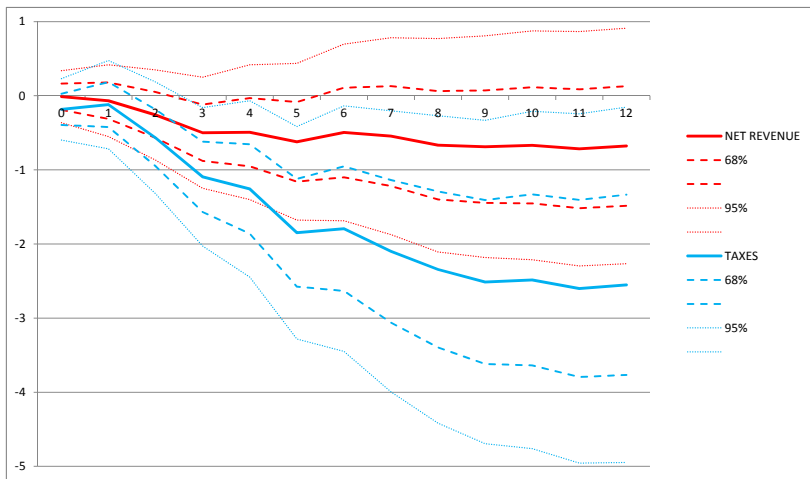


Figure 4 : Significant Differences of Fiscal Multipliers



## Results are robust to...

- Exogenous / endogenous classification of shocks
- Alternative lag lengths
- Alternative specifications of endogenous variables ( $g, \tau, i, \rho$ )
- Outliers
- Not robust to shortening the sample (level of multipliers)

## Central Findings

- Full record of *taxes + social security contributions – transfers* can help reconcile results from top-down and bottom-up identification for Germany
- Net revenue shocks of the narrative are in line with the net revenue shocks of top-down approach  $\rightarrow m \approx 0.5 - 1$

## Open Questions / Ideas

- Social security shocks alone deliver implausibly zero to negative multipliers.
- Do we correctly capture the interference of separate tax and social security shocks?
- What about interference with the general gov't spending side?
- Incorporate shock series into Mertens and Ravn (2012); Perotti (2012) framework

Thank you very much!

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