

Temporary VAT Reduction during the Lockdown Evidence from Germany

24th August 2022

Marius Clemens Werner Röger

Federal Ministry of Finance Germany, DIW Berlin

prepared for the EEA/ESEM 2022, Milano

*This paper should not be reported as representing the views of the German Federal Ministry of Finance. The views expressed are those of the authors and do not necessarily reflect those of the Federal Ministry of Finance.

Motivation

- ▶ Lockdown 2Q2020 has reduced consumption by 10 percent
 - ▶ German Government decided not only to provide financial aid but also a large stimulus program of 160 bn Euro (5 percent of recent GDP)
 - ▶ Most discussed: Temporary VAT reduction of 3 percent until end of 2020
 - „Not targeted enough“, „ineffective in presence of lockdown measures“ and „too costly (because of limited pass-through to consumer prices)“
 - + „negative demand spillovers“, „powerful if the central bank operates at the zero lower bound (ZLB)“
- VAT effects ambiguously

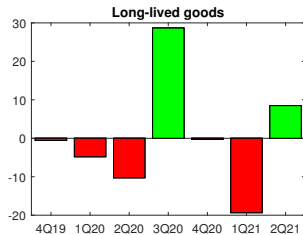
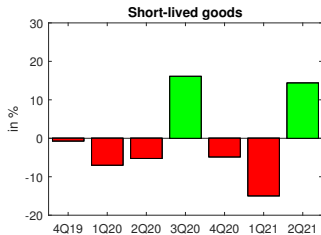
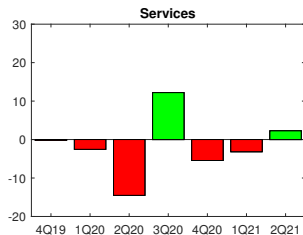
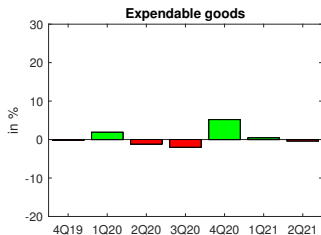
Aim of the paper

- ▶ What are the temporary VAT effects during the lockdowns in Germany?
- ▶ Was the German temporary VAT reduction an effective stabilization tool?

Our contribution

- ▶ **Theoretical effects of a temporary VAT rate change** (Barrell and Weale (2009), Büttner and Madzharova (2017), Voigts (2016)) → important role of durable/non-durable, limited PT, income effect
- ▶ **Empirical literature on temporary VAT changes** (Barrell and Weale (2009), Crossley et al. (2009), Crossley et al. (2014), Fuest et al. (2021), Bachmann et al. (2021)) → sizeable substitution effects (32 bn Euro, ST-multiplier: 1.8) in case we explicitly consider durables for the German temporary VAT reduction 2020, Lockdown lowers effectiveness

COVID-19 pandemics and consumption



Model structure

- ▶ Standard NK model calibrated to German data
- ▶ NK frictions: Monopolistic competition ([Rotemberg and Woodford \(1996\)](#)), Adjustment costs ([Calvo \(1983\)](#))
- ▶ durables and non-durable consumption
- ▶ Partial lockdown
- ▶ Government sector with fiscal rule ([Leeper et al. \(2017\)](#))
- ▶ VAT channels
 - ▶ Substitution/income effect
 - ▶ Durable investment effect
 - ▶ Imperfect pass-through

VAT channel la

substitution effect (through Euler eq)

$$\frac{C_{t+1}^U}{C_t^U} = \beta(1 + i_t) \frac{P_t^{C,U}}{P_{t+1}^{C,U}}$$

without(!) durables/nondurables

$$P_t^{C,U} = (1 + \tau_t^{vat}) P_t^Y,$$

$\rightarrow E_t \Delta \tau_{t+1} > 0, E_t \Delta \tau_{t+2} < 0 \rightarrow E_t \pi_{t+1} \downarrow, E_t \pi_{t+2} \uparrow \rightarrow$
 $\Delta C_{t+1}^U > 0, \Delta C_{t+1}^U < 0$

VAT channel Ib

income effect (LC HH budget constraint, without(!)
durables/nondurables)

$$(1 + \tau_t^{vat}) P_t^{C,LC} C_t^{LC} = (1 - \tau_t^W) W_t L_t^{LC} + Z_t,$$

→ direct positive effect on LC HH consumption

VAT channel II

with durables vs. non-durables

$$D_t^U = \left(\frac{\bar{\psi}^D}{\bar{\psi}^N} \right) (P_t^N)^{\sigma^{n,d}} (P_t^D R_t^{D,U})^{\frac{1}{\sigma^{n,d}}} N_t^U$$

and

$$R_t^{D,U} = r_t - E_t \pi_{t+1}^D + \delta^d - \Delta E_t \tau_{t+1}^{vat}$$

VAT reduction increases durable demand strongly

VAT channel III

Imperfect pass-through (Retail sector):

$$\Pi_t = P_t^C(j)(1 + \tau_t^{\text{vat}})Y_t^C(j) - P_t Y_t - \frac{\gamma^P}{2} (\text{adj}_t^P)^2 - \tau_t^{\text{vat}} P_t(j) Y_t(j)$$

with price adjustment costs

$$\text{adj}_t^P = \left[\frac{(P_t^C(j)(1 + \tau_t^{\text{vat}}))^{\gamma^{\text{VAT}}}}{(\Pi_{t-1}^C)^{s^P} (\Pi_{t-1}^C)^{1-s^P} (P_{t-1}^C(j)(1 + \tau_{t-1}^{\text{vat}}))^{\gamma^{\text{VAT}}}} - 1 \right]$$

with $\gamma^{\text{VAT}} = 0$, firms have lower price adjustment costs due to the VAT change (VAT change=CPI inflation).

with $\gamma^{\text{VAT}} = 1$, price adjustment costs do not depend on the source of the price change.

Lockdown shock

Specific assumptions

- ▶ 2 sectors (affected, non-affected) both produce D & ND
- ▶ LD Shock: $L_t = 0$, $K_t = (1 - \delta)K_{t-1}$ in A sector
- ▶ zero wage and zero capital income from sector 1, but transfer income (short-time work)
- ▶ LD Shock: quantity constraint for consumption in both sector (0 in A sector, \bar{C} in NA sector → forced savings)

Monetary and fiscal policy

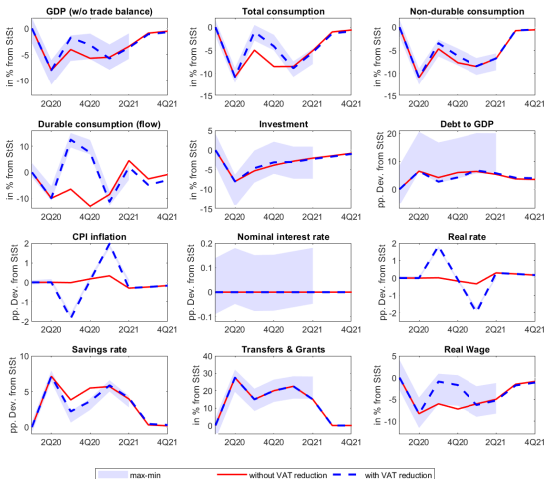
Specific assumptions

- 1 Monetary policy rule: ZLB constraint
- 2 Fiscal rule: set off the debt rule for 3 years

Parametrization

- 1 Matching empirical macro ratios and literature
- 2 γ^D : reaction of durables
- 3 γ^{VAT} : price inflation

Macroeconomic effects of the VAT cut 2Q2020–2Q2021



Unexpected lockdown shocks in 2Q2020 and 4Q2020-2Q2021 with (blue) and without (red) an unexpected VAT rate reduction of 3 pp (3Q-4Q2020)

VAT Multiplier: Lockdown vs. No Lockdown

Frequency	3Q & 4Q	after 1 year	after 5 years
No Lockdown			
w/o durable goods, no ZLB	0.68	0.55	0.17
with durable goods, no ZLB	2.11	1.60	0.65
with durable goods, ZLB	1.92	1.65	1.01
Lockdown - Baseline			
Lockdown, ZLB	1.77	1.48	0.82

Own simulations and calculations

- + strong short-term effect → effective crisis stabilization
- low medium-term effect → not very efficient

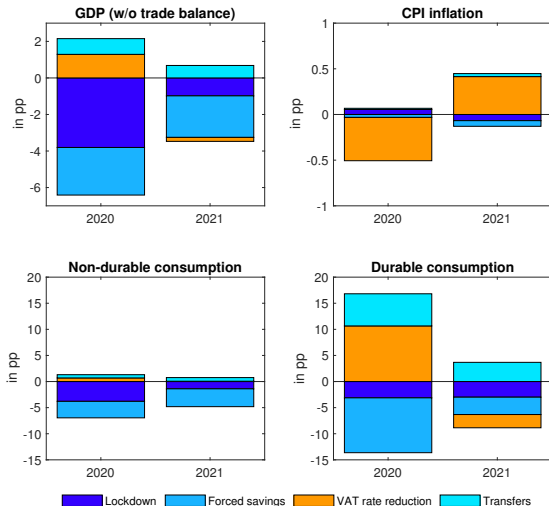
VAT Multiplier: Counterfactuals

Frequency	3Q & 4Q	after 1 year	after 5 years
Lockdown - Counterfactuals			
Lockdown, ZLB, no Kinderbonus	1.67	1.35	0.59
Lockdown, No ZLB	2.36	2.24	1.67
Lockdown, ZLB, full pass-through	3.35	2.58	0.99
Lockdown, ZLB, second VAT shock	1.38	0.73	-0.49
Lockdown - Baseline			
Lockdown, ZLB	1.77	1.48	0.82

Own simulations and calculations

- ▶ confirms general observations
- ▶ lower ZLB effect: missing CB accommodation
- ▶ lower Effects under Lockdown

Decomposition of the VAT Effect in Germany



Conclusion

What are the temporary VAT effects during the lockdowns in Germany?

- ▶ GDP increases in total by roughly 32 bn Euro, (ST-multiplier 1.7) in 2020, mainly due to durables (cars, bikes,..)
- ▶ But negative effects in 2021 (Cumul. multiplier reduces to 0.8 in 2025)

Was the German temporary VAT reduction an effective stabilization tool?

- ▶ by considering durables we find sizeable ST GDP effects (> 1) even under limited VAT pass-through
- ▶ but not over the medium-term (< 1)
- ▶ lockdown reduces effectiveness, extensions are less effective

Thank you for your attention!

Literatur I

- Bachmann, R., Born, B., Goldfayn-Frank, O., Kocharkov, G., Luetticke, R., and Weber, M. (2021). A Temporary VAT Cut as Unconventional Fiscal Policy. NBER Working Paper 29442, National Bureau of Economic Research.
- Barrell, R. and Weale, M. (2009). The Economics of a Reduction in VAT. *Fiscal Studies*, 30(1):17–30.
- Büttner, T. and Madzharova, B. (2017). The Effects of Pre-announced Consumption Tax Reforms on the Sales and Prices of Consumer Durables. VfS Annual Conference 2017 (Vienna): Alternative Structures for Money and Banking 168201, Verein für Socialpolitik / German Economic Association.
- Calvo, G. A. (1983). Staggered prices in a utility-maximizing framework. *Journal of Monetary Economics*, 12(3):383–398.
- Crossley, T., Low, H., and Sleeman, C. (2014). Using a Temporary Indirect Tax Cut as a Fiscal Stimulus: Evidence from the UK. IFS Working Papers W14/16, Institute for Fiscal Studies.
- Crossley, T. F., Low, H., and Wakefield, M. (2009). The Economics of a Temporary VAT Cut. *Fiscal Studies*, 30(1):3–16.
- Fuest, C., Neumeier, F., and Peichl, A. (2021). Hat die Mehrwertsteuersenkung den Konsum belebt? *ifo Schnelldienst Digital*, 2(1).
- Leeper, E. M., Traum, N., and Walker, T. B. (2017). Clearing Up the Fiscal Multiplier Morass. *American Economic Review*, 107(8):2409–2454.
- Rotemberg, J. J. and Woodford, M. (1996). Imperfect Competition and the Effects of Energy Price Increases on Economic Activity. *Journal of Money, Credit and Banking*, 28(4):550–577.
- Voigts, S. (2016). VAT Multipliers and Pass-through Dynamics. SFB 649 Discussion Papers SFB649DP2016-026, Sonderforschungsbereich 649, Humboldt University, Berlin, Germany.