The COVID19-Pandemic in the EU: Macroeconomic Transmission and Economic Policy Response

MMCN Webinar Series on "Macroeconomic Modelling and Pandemics"

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Introduction

Covid-19 is the dominant economic shock which will shape economic activities in 2020 and beyond.

Nearly all forecasts published in Spring project the deepest recession in the post war era.

Governments have announced massive stabilisation efforts.

Besides automatic stabilizers, short time work allowances (STW) and liquidity support (LIQS) in the form of government guarantees are the dominant instruments.

Structure of presentation

This presentation adapts the Commission's Macroeconomic model QUEST III to

- Look at the various **transmission channels** of the shock.
- **Quantify** their respective impact on depth and duration of the recession.
- Present some analysis on the effects of **short time work allowances and liquidity support**.

Two region QUEST Model: EU - RoW

Frictions:

- Nominal price rigidity: Price Phillips curve.
- Nominal and real wage rigidity: Wage Phillips curve
- Employment adjustment costs.

- A share of households is liquidity constrained.
- But: Habit persistence has been turned off: consumers exit consumption lockdown quickly.
- Investment adjustment costs.

- Restricted monetary policy: limited interest rate response.
- Automatic fiscal stabilisation via tax revenues, constant spending in real terms and unemployment insurance.

4Additional info on QUEST: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/economic-research/macroeconomic-models_en

Transmission channels

We quantify **different economic transmission channels** of the pandemic:

i. **Supply shocks** through containment measures.
ii. Shortfalls in **consumer demand**.
iii. **Liquidity constraints** for firms.
iv. **Policy** supports demand and cushions liquidity shortfalls.

Supply and demand shock (see Jonung and Roeger, 2006)

Related work published in DG ECFIN's spring forecast considers additional channels (e.g. uncertainty, longer targeted containment) and a larger model

Demand lockdown

- **Self-imposed:** Households avoid certain consumption activities. Reduced marginal utility of consumption in period t.
- **Government imposed:** Households are prevented from undertaking certain consumption activities.
- Because of externalities, the analysis of Eichenbaum, Rebelo and Trabandt (2020) suggests that government imposed constraints are more relevant during lockdown.

Consumption Shock: unconstrained HH

Intertemporal utility function

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[\left(\frac{1}{1+\mu_t} \right) \log(C_t^U) - \chi \frac{N_t^{\kappa+1}}{\kappa+1} \right]$$

$\left(\frac{1}{1+\mu_t}\right) < 1$: Self imposed demand constraint in t

$C_t^U \leq \bar{C}^U$: Regulatory constraint on consumption (binding in t, $\phi_t^C > 0$)

$$\frac{C_{t+1}}{C_t} = \beta(1+r_t)(1+\mu_t)(1+\phi_t^C)$$

Both reduce consumption in t, but they have different policy implications.

The latter prevents fiscal policy measures from increasing C_t.

Consumption Shock: constrained HH

Are affected similarly.

Self imposed consumption constraint

$$w_t N_t + TR_t > C_t^C$$

Regulatory constraint

$$w_t N_t + TR_t > \bar{C}^C$$

Forced savings

$$\Delta B_t^C = C_t^C - w_t N_t - TR_t + T_t$$

And dissaving in periods following the lockdown

$$C_{t+i}^C = w_{t+i} N_{t+i} + sB_{t+i-1}^C$$

Supply lockdown

Governments impose restrictions on labour input to avoid infections.

Decision problem of entrepreneur:

$$E_0 \sum_{t=0}^{\infty} \beta^t \left[\left(\frac{1}{1+\mu_t} \right) \log(C_t) \right]$$

$$L_t = (1 + r_{t-1}) L_{t-1} + C_t + I_t - (Y_t - W_t N_t)$$

Labor adjustment costs

$$Adj(N_t) = \theta^N \left(\frac{N_t}{N_{t-1}} - 1 \right)^2$$

Labor input constraint:

$$N_t \leq \bar{N}_t$$

Labour input constraint

Labor input constraint:

$$N_t \leq \bar{N}_t$$

Shifts down the labour demand schedule.

$$\frac{\partial Y}{\partial N_t} = W_t + \phi_t^N \qquad \text{with } \phi_t^N > 0 \; if \; N_t = \bar{N}_t$$

Liquidity constraints

Demand and supply lockdown reduces GOS of firms (GOS = Y – wage bill)

Δ : difference between the pandemic and non-pandemic scenario

$$\Delta I_t = \Delta L_t + \Delta GOS_t$$

When banks tighten credit supply investment declines more than GOS.

Investment rule (augmented Q-equation):

$$\left(\frac{I_t}{K_{t-1}} - \delta\right) = (1 - s_t^{li})Qadj_t + s_t^{li}\left(\frac{GOS_t}{K_{t-1}} - \delta - \alpha\right)$$

Share of liq. constrained investment : $s_t^{li} = 0.3$

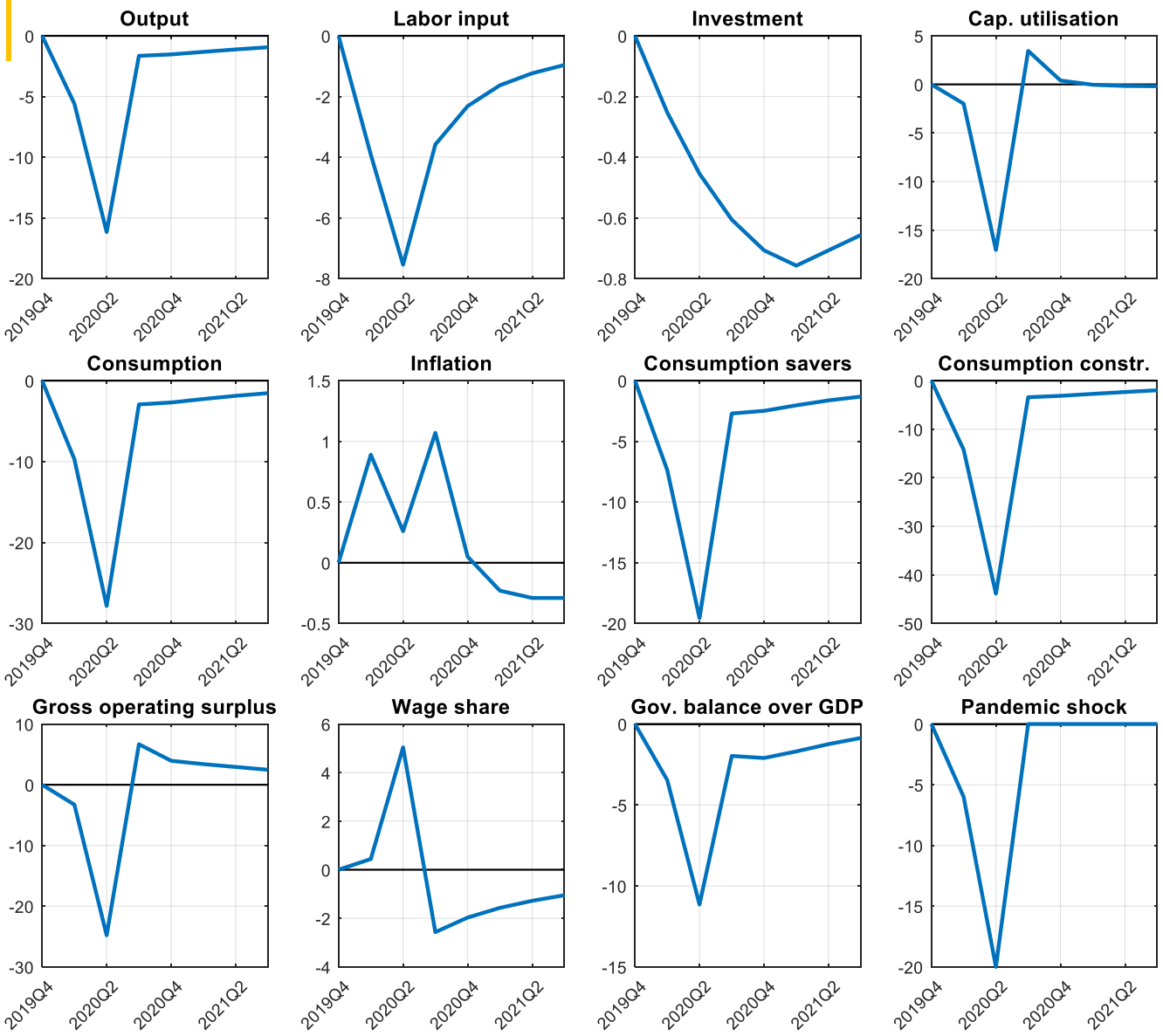
Shock assumptions

- All shocks are global.
- **Absence of workforce (containment)** active in March till June with a peak early in Q2 -> affects 40% of the work force
    - **Difficult distinction between supply and demand:**
        - Supply constraints are only one factor behind the closure of shops and factories.
        - Supply shocks can have “Keynesian” features (Guerrieri, Lorenzoni, Straub, Werning, 2020)
- **Sectoral demand shortfalls** are based on detailed assumptions.
    - Particularly strong declines in air transport, accommodations, restaurants, tourism etc.
    - The shock extends into Q3 and Q4 for some sectors.

Assumed sectoral declines

NACE_R2/GEO	% of VA	Reduction 2020Q1(%)		Reduction 2020Q2(%)	
		Hours work	Demand	Hours work	Demand
Agriculture, forestry and fishing	1.8	-1.0	0.0	-4.0	0.0
Mining and quarrying	0.4	-1.0	0.0	-4.0	0.0
Manufacturing	17.2	-1.0	-2.0	-4.0	-6.6
Electricity, gas, steam and air conditioning suppl	1.8	-1.0	0.0	-4.0	0.0
Water supply; sewerage, waste management and	0.9	-1.0	0.0	-4.0	0.0
Construction	5.2	-1.0	0.0	-4.0	-5.5
Wholesale and retail trade and repair of motor ve	1.5	-1.0	-10.0	-4.0	-33.0
Wholesale trade, except of motor vehicles and m	5.5	-1.0	-10.0	-4.0	-33.0
Retail trade, except of motor vehicles and motorc	4.3	-1.0	-10.0	-4.0	-33.0
Land transport and transport via pipelines	2.3	-1.0	-8.0	-4.0	-33.0
Water transport	0.2	-1.0	-8.0	-4.0	-33.0
Air transport	0.3	-1.0	-25.0	-4.0	-82.5
Warehousing and support activities for transpor	1.8	-1.0	0.0	-4.0	0.0
Postal and courier activities	0.4	-1.0	0.0	-4.0	0.0
Accommodation and food service activities	2.9	-1.0	-25.0	-4.0	-77.0
Information and communication	4.8	-1.0	0.0	-4.0	0.0
Financial and insurance activities	4.6	-1.0	0.0	-4.0	0.0
Real estate activities	10.8	-1.0	-5.0	-4.0	-11.0
Professional, scientific and technical activities	6.5	-1.0	0.0	-4.0	0.0
Administrative and support service activities	4.6	-1.0	0.0	-4.0	-16.5
Public administration and defence; compulsory s	6.5	-1.0	0.0	-4.0	0.0
Education	4.9	-1.0	-5.0	-4.0	-11.0
Human health and social work activities	7.4	0.0	0.0	0.0	0.0
Arts, entertainment and recreation	1.3	-1.0	-20.0	-4.0	-60.5
Other service activities	1.7	-1.0	0.0	-4.0	-5.5
Activities of households as employers; househo	0.4	-1.0	0.0	-4.0	0.0
Total - all NACE activities	100	-0.9	-3.5	-3.7	-11.8

Supply and demand, without liquidity problem



V shaped recession in Q1 and Q2

Delayed N response, partly offset by UCAP

Strong decline of C

Small decline of I: temp. S+D shocks cannot explain fall of I

Strong decline of GOS =>liquidity problems

Note: Wage share and government balance over GDP (all other variables) are expressed in percentage point deviation (percent deviation) from a pre-COVID-19 baseline Pandemic shock is an index..

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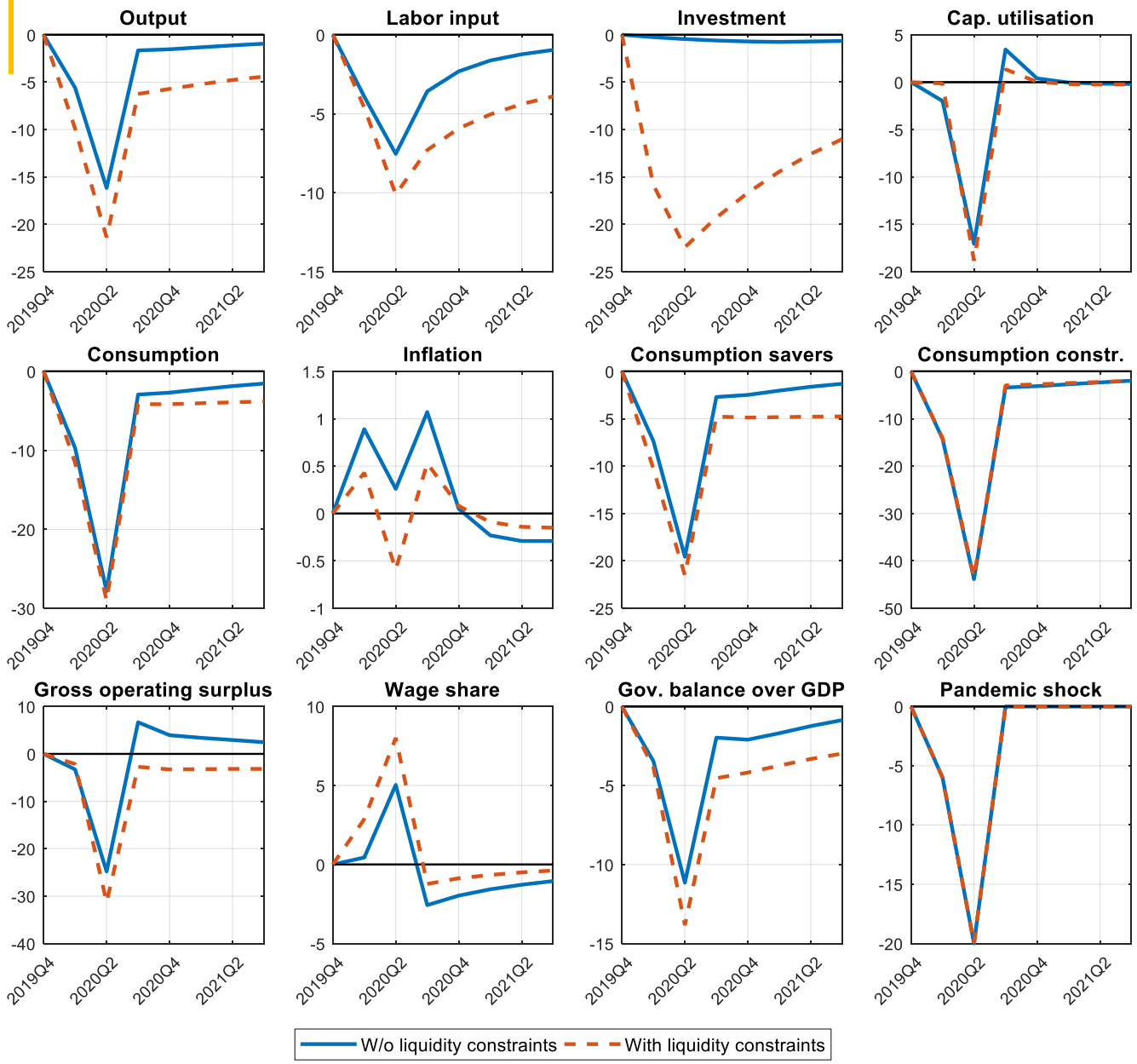
Impact of liquidity constraints



Liquidity channel can generate a decline of I.

Persistence because of I adjc

N more persistent

Y more U shaped.

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Announced fiscal measures

	bln EUR	*% of GDP*
1. Measures with a direct budgetary impact		
Expenditure	**368**	**2.8**
2. Liquidity measures without budgetary impact		
a. Tax delays	248	1.9
b. Public guarantees	2301	17.6
c. Others	334	2.6
Total liquidity support1	**2882**	**22.1**

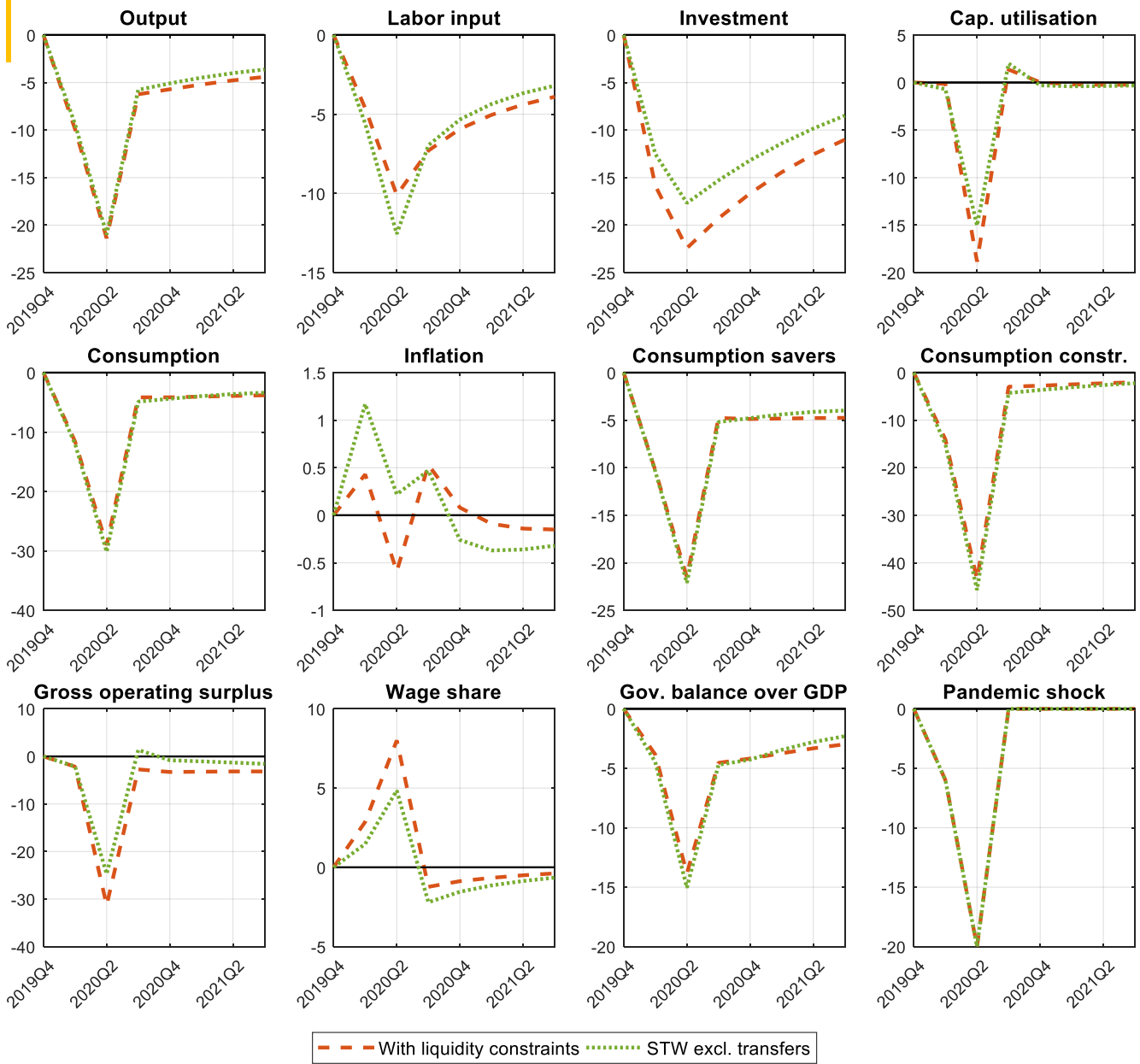
STW-Short time work allowances

Comparison with unemployment benefits:

STW reduces employment adjustment costs

STW is more generous

Effects of STW: employment adjustment



STW allow firms to adjust labor input more in Q2.

This stabilizes GOS of firms

Less firms become liquidity constrained

I declines less

N recovers more strongly.

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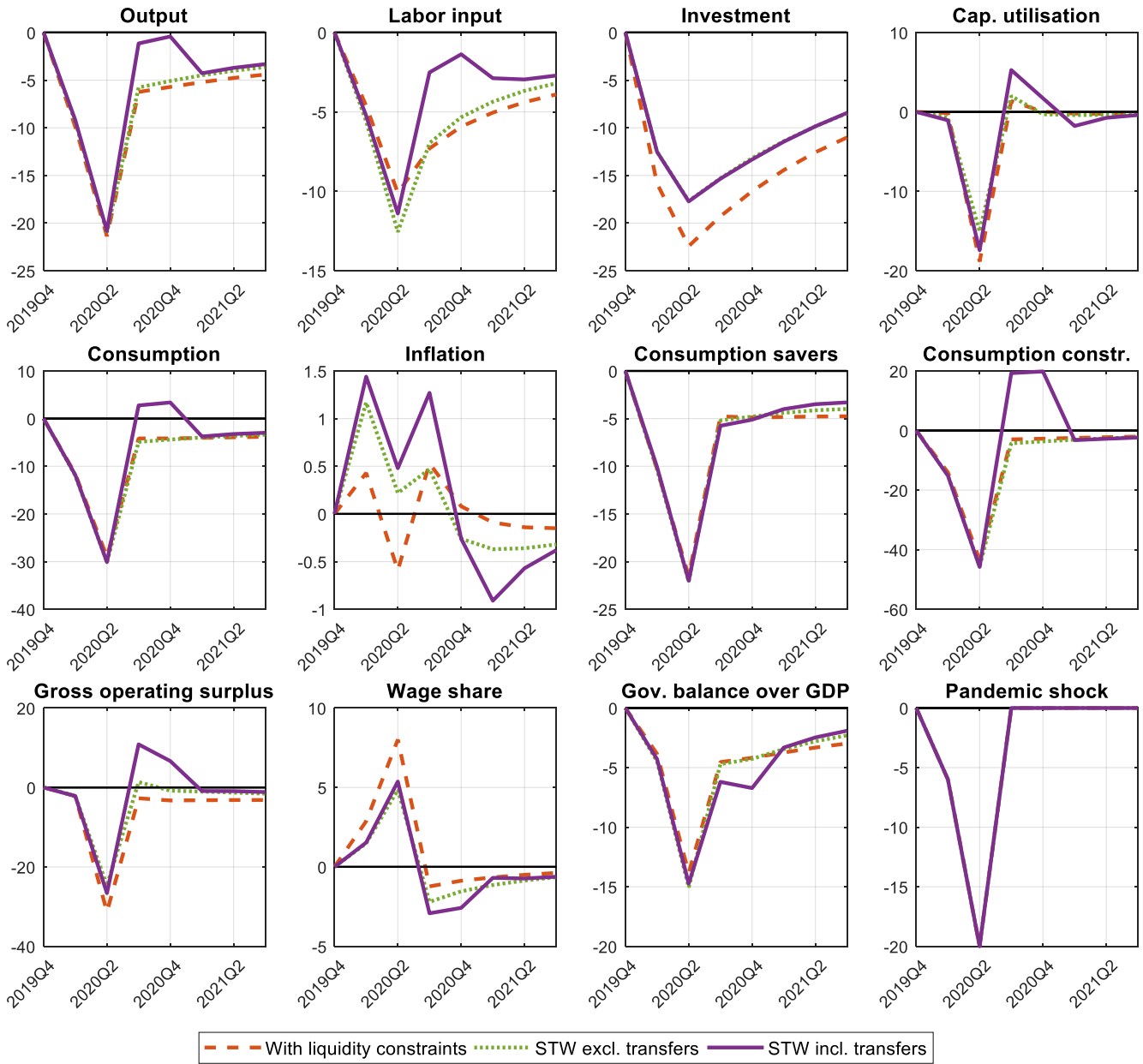
Effects of STW + Transfers (liq. constr. HH)



The 2.8% discretionary measures are spend as transfers to HH.

Transfers paid/spend in Q3 and Q4 can facilitate exit.

Boost to employment (STW: more flexibility)

Improves risk sharing among households: Consumption of constrained households declines a lot because of higher U and ST-work.

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Assumptions on liquidity support

LIQS - **liquidity support**: Max **22%** of GDP

Goal: Stabilise investment of liquidity constrained firms.

Take up rate difficult to measure. We can nevertheless say something about the **'guarantee multiplier'**.

To a first approximation (assuming GOS not much affected by LIQS) the investment multiplier to a loan increase is 1

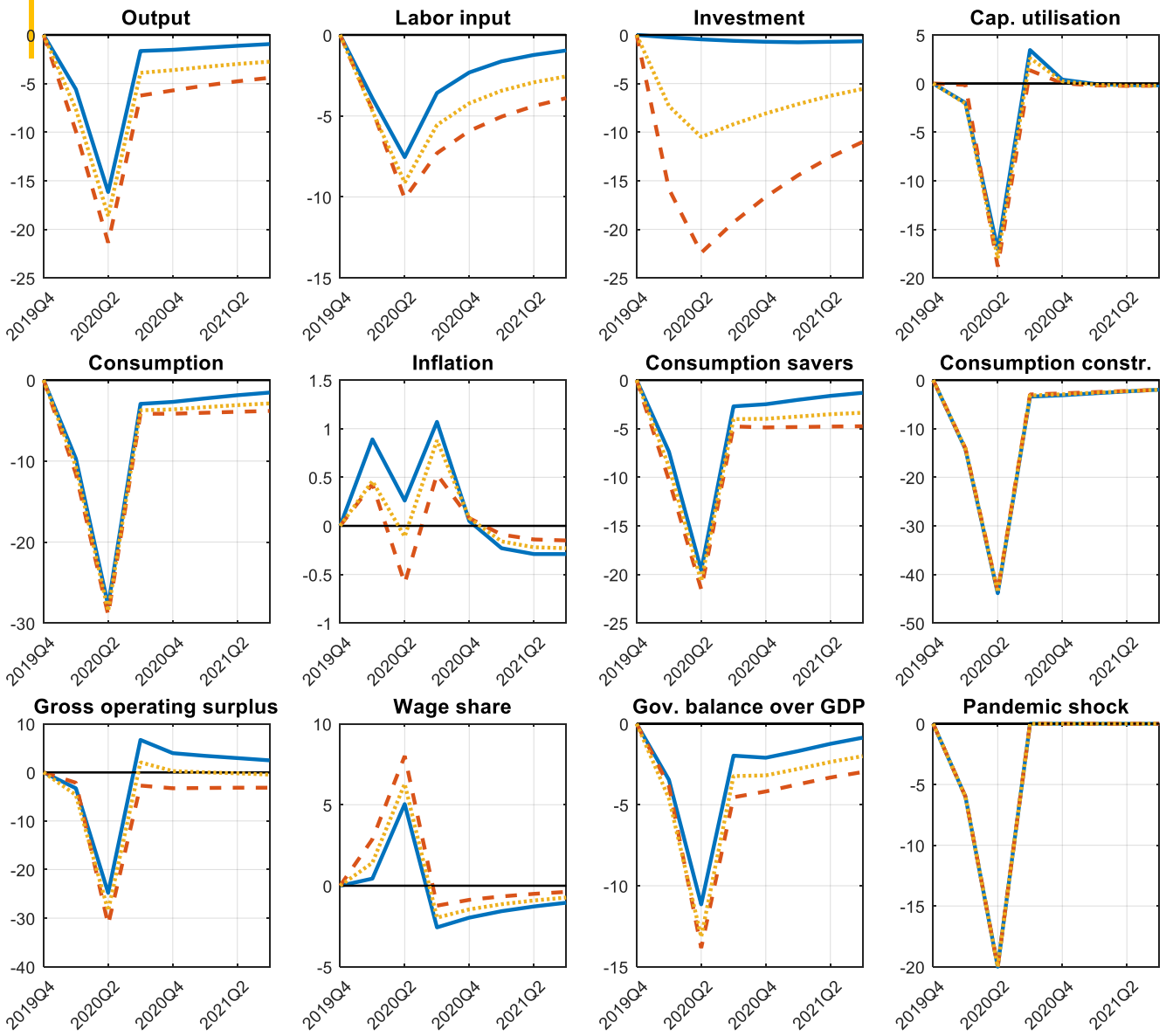
$$I_t^G - I_t^C = \Delta L_t^G - \Delta L_t^C$$

$\Delta L_t^G - \Delta L_t^C$ fully guaranteed by the government.

Assuming a loss rate of ca. 20% yields multiplier

$$m^G = \frac{Y_t^G - Y_t^C}{0.2 * (\Delta L_t^G - \Delta L_t^C)}$$

Effects of guarantees



If losses from LIQS are restricted to new loans (and do not cover losses from existing loans), the guarantee multiplier is large (ca. 5).

LIQS primarily target the liquidity channel, but cannot offset direct effects from the lockdown.

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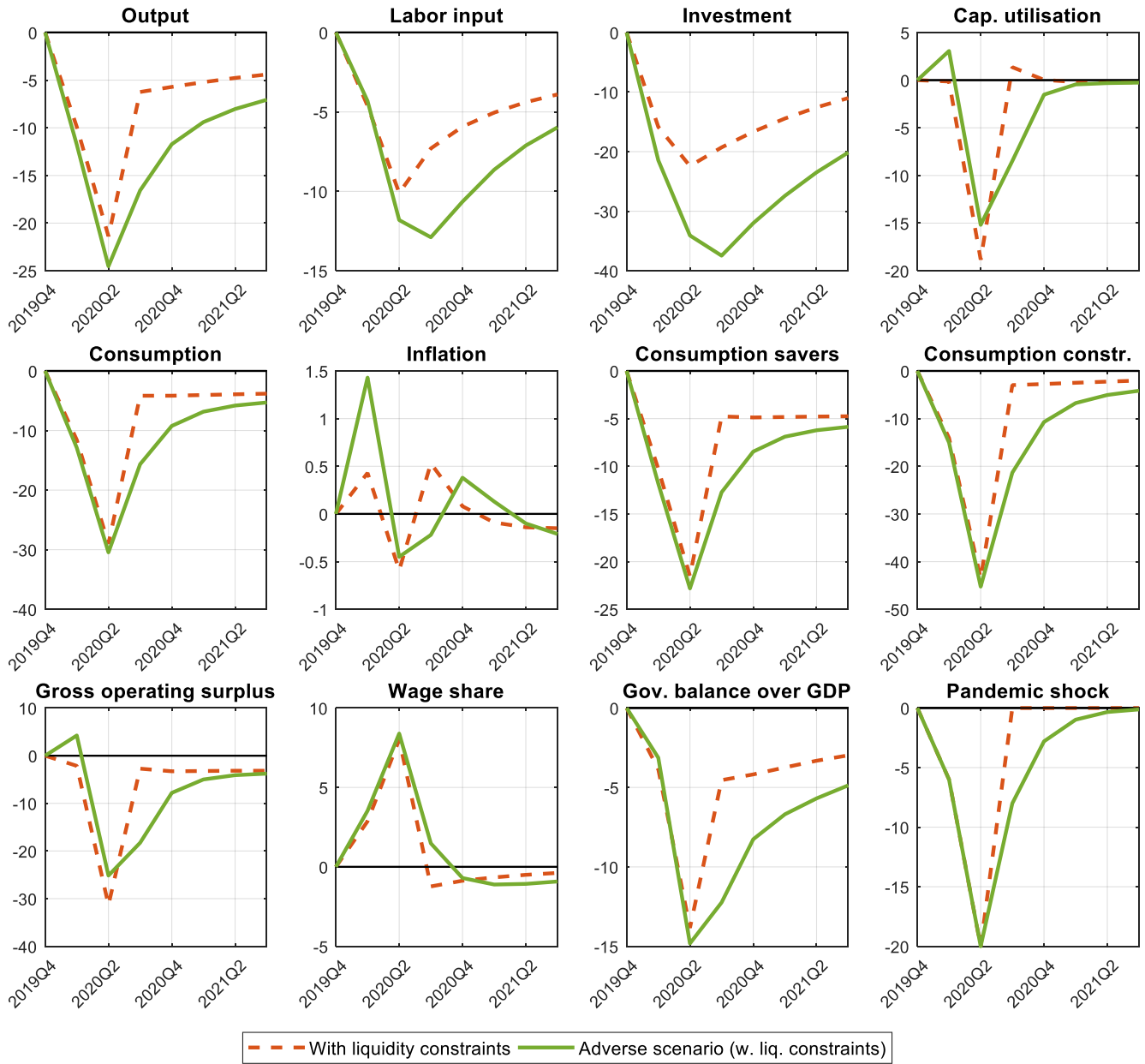
Longer Pandemic



Duration of pandemic is crucial for the length of the economic downturn.

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Overview results

Scenario	No liq. constr.		Liq. constraints		STW		Guarantees		Adverse (no policy)	
	2020	*2021*	*2020*	*2021*	*2020*	*2021*	*2020*	*2021*	*2020*	*2021*
GDP	-6.7	-1.4	-10.8	-4.6	-8.6	-3.9	-8.6	-3.0	-16.1	-7.7
Consumption	-10.8	-1.8	-12.2	-3.9	-8.9	-3.2	-11.6	-3.0	-17.1	-5.7
Investment	-0.5	-0.7	-18.5	-11.9	-14.7	-9.2	-8.8	-5.9	-31.2	-22.1
Labor input	-4.3	-1.2	-7.0	-4.2	-5.1	-2.8	-5.9	-2.8	-9.9	-6.7
GOS	-4.4	2.7	-9.9	-3.2	-2.8	-1.1	-7.7	-0.3	-11.8	-4.1
Wage share	0.2	-1.2	2.2	-0.5	0.3	-0.6	1.1	-0.8	3.2	-1.0
Gov. balance/GDP	-4.7	-1.1	-6.6	-3.2	-8.0	-2.3	-6.1	-2.2	-9.6	-5.4

Conclusions

Recession:

Temporary demand and supply shocks lead to V shaped recessions in a standard New Keynesian Model.

However, one feature of a lockdown, namely a strong decline of GOS can induce liquidity constraints on firms. This generates persistence.

Policy:

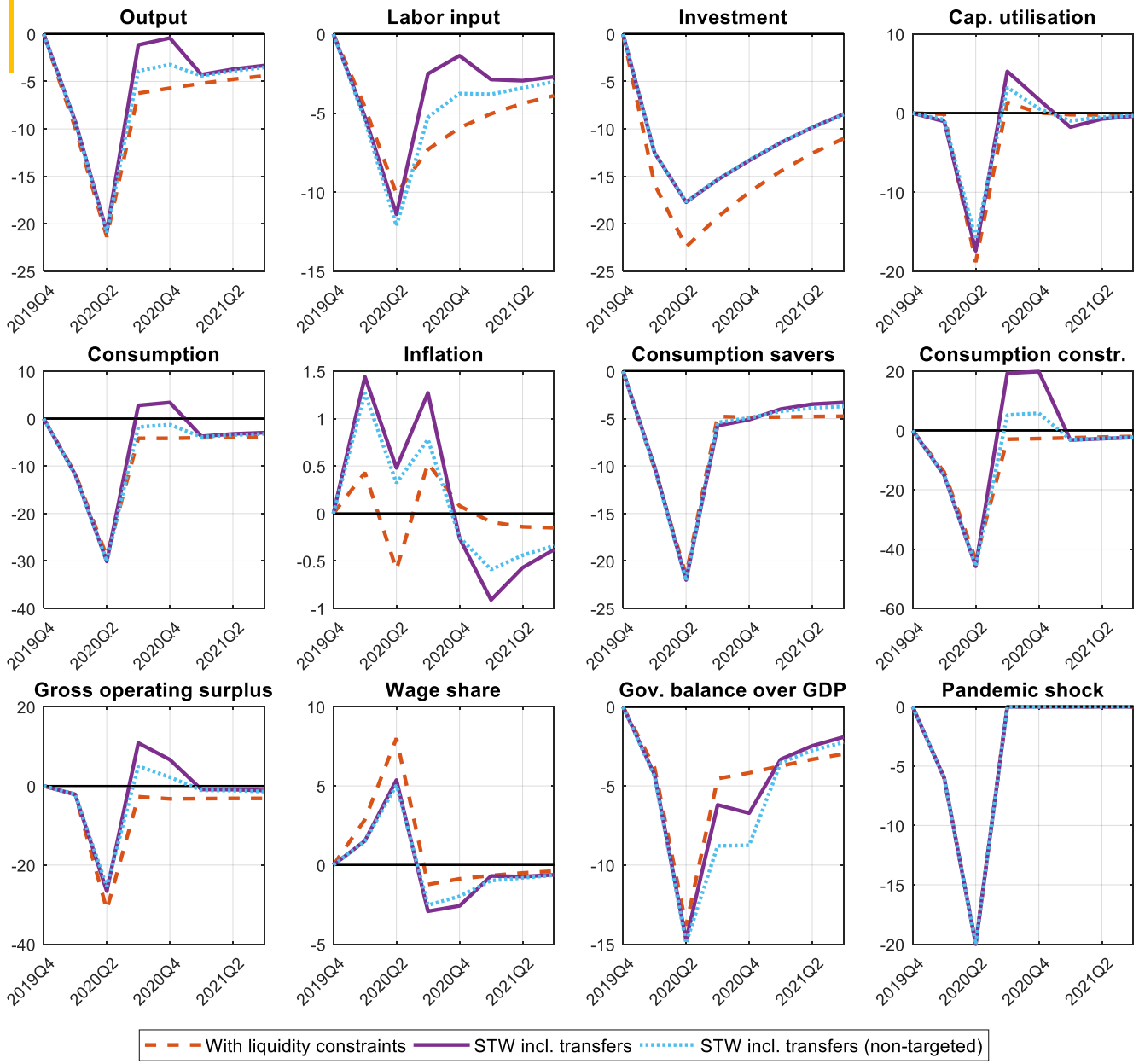
Given that lock downs cannot be stabilised when they are present, policies should target a rapid exit, once the lockdown is lifted.

STW: desirable policy, apart from reducing stress for employees associated job loss, it allows more labour input flexibility, reduces liquidity constraints of firms and fosters exit from the lockdown.

LIQS targets investment and employment which supports exit from the lockdown as well.

Reserve Slides

STW (robustness)



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