SACHVERSTÄNDIGENRAT
zur Begutachtung der
gesamtwirtschaftlichen Entwicklung

Panel: Inflation objective, structural forces, central bank communication

Volker Wieland
GCEE and IMFS, Goethe University Frankfurt

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"Most importantly, the last decade has been defined by a **persistent decline in inflation** among advanced economies. In the euro area, annual inflation **averaged 2.3% from 1999** to the eve of the great financial crisis in August **2008, but only 1.2% from then until the end of 2019.**

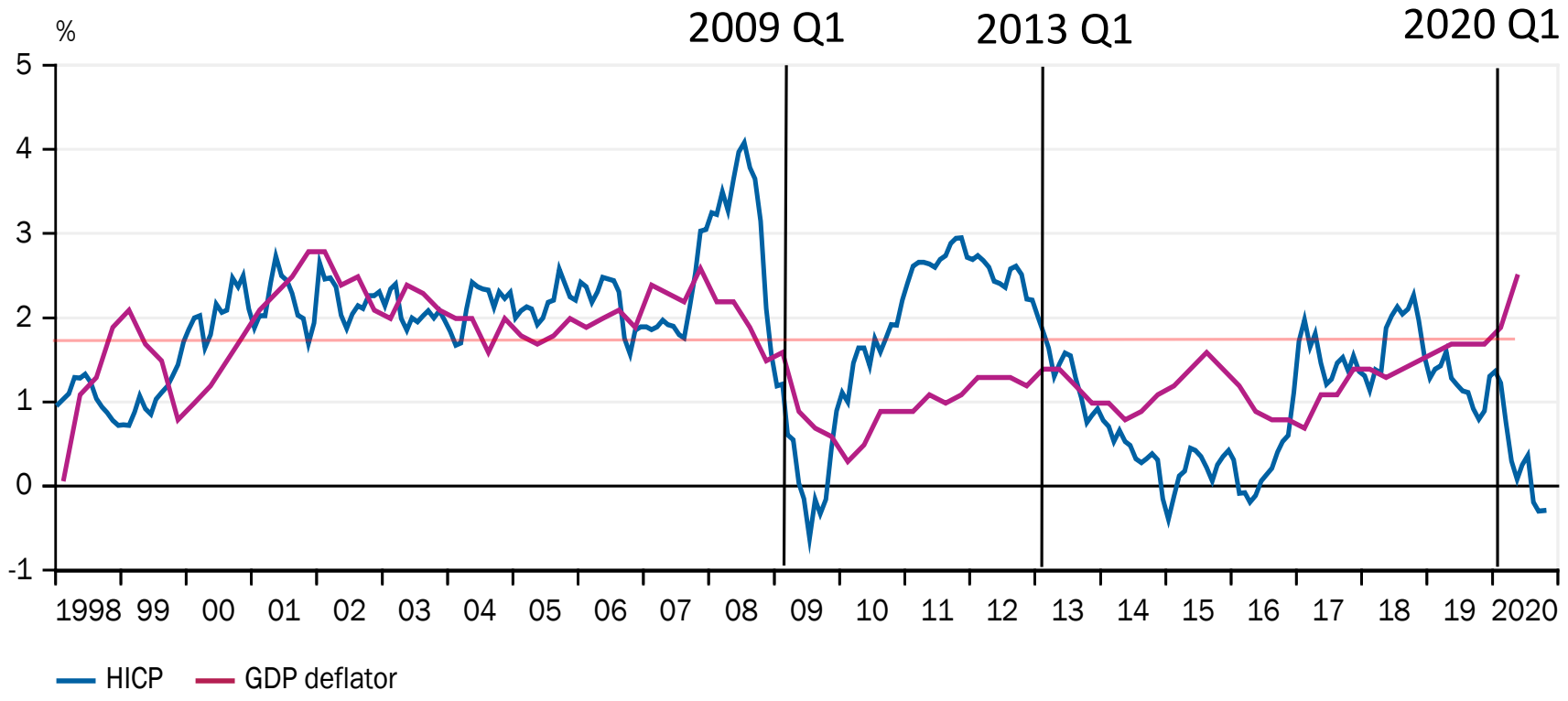
We need to thoroughly analyse the **forces that are driving inflation dynamics** today, and consider whether and how we should **adjust our policy strategy** in response."

Inflation averages – 3 periods: Pre-financial-crisis decade, double recession & recovery

Inflation measures % growth rates	1999 Q1 - 2009 Q1 Up to GFC recession	2009 Q2 - 2013 Q1 Double recession	2013 Q2 – 2020 Q1 Recovery
HICP: Harmonized Index of **Consumer Prices** in the euro area	**2.2**	**1.8**	**0.9**
GDP Deflator: **Prices** of all goods & services **produced** in the euro area	**2.0**	**1.0**	**1.3**
Import Price Deflator: **Prices** of **imported** goods & services.	**1.6**	**2.1**	**-0.3**

Domestic price inflation reached 1.8 % end of 2019

Growth rates of HICP and GDP deflator in the euro area



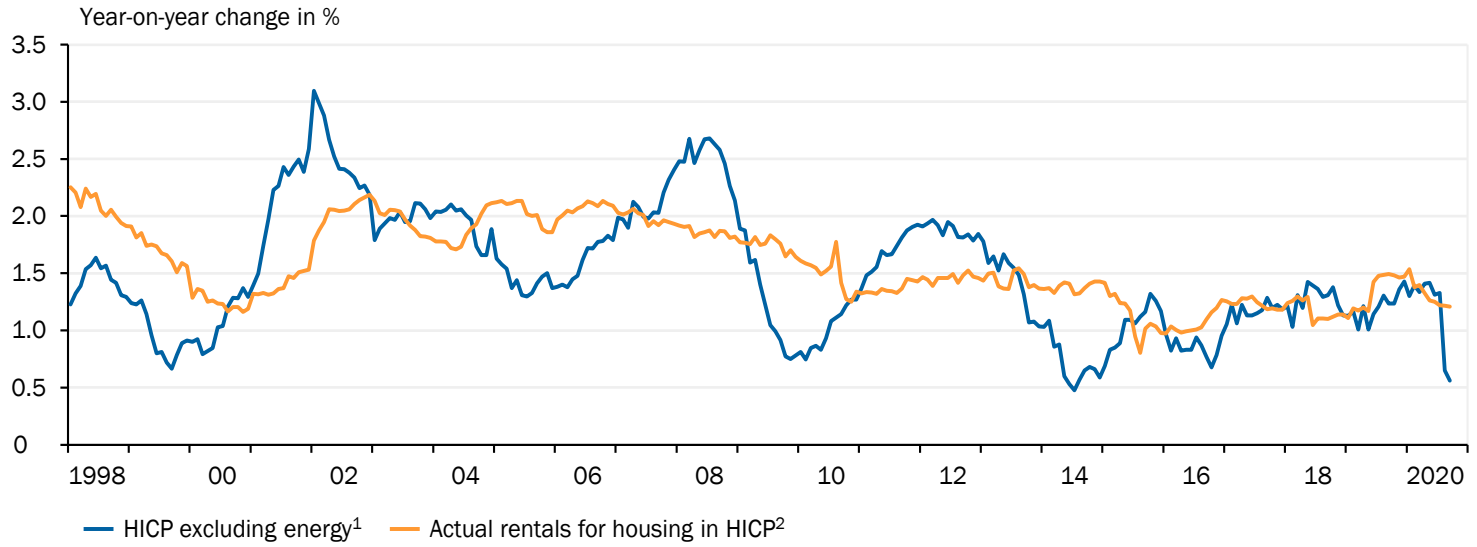
Sources: ECB, Eurostat

- HICP & GDP deflator very similar from 1998 to mid 2007.
- HICP more variable in double recession.
- GDP deflator trends up with recovery.

Bletzinger-Wieland ECB target estimate from reaction function: 1.74%

Cost of housing under-represented in HICP, only rental cost while owner-occupied housing is not included.

Actual rentals for housing and HICP excluding energy: Euro area



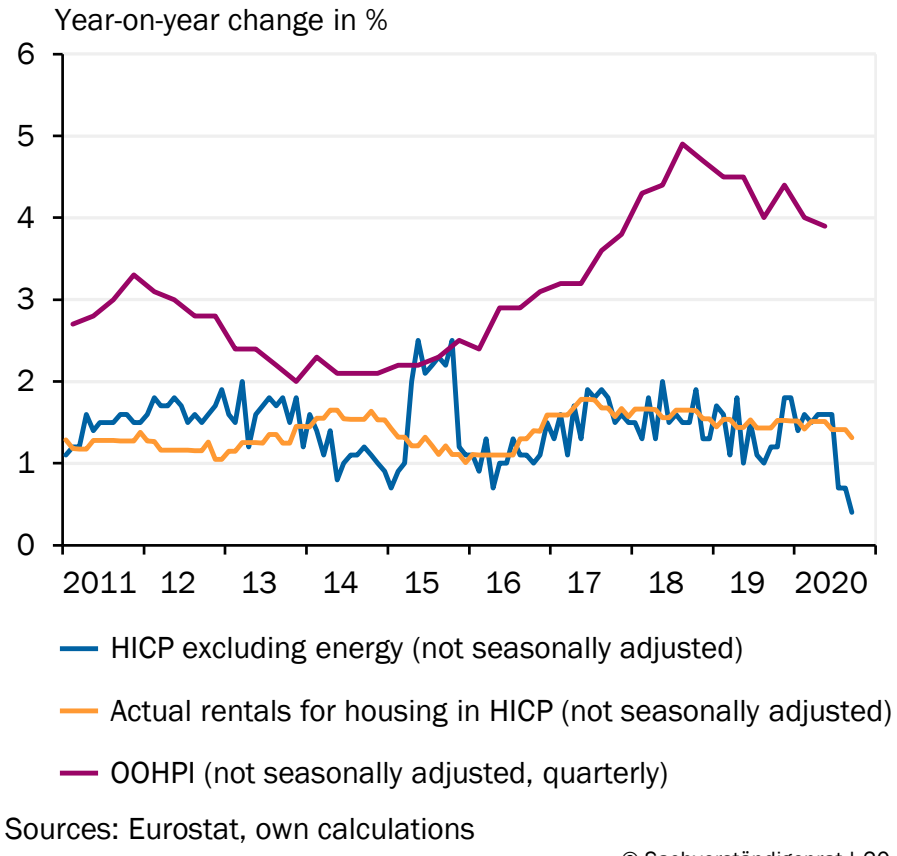
1 – Working day and seasonally adjusted. 2 – Not seasonally adjusted.

Sources: ECB, Eurostat, own calculations

- Cost for housing under-represented in HICP.
- Low weights of rental cost.
- Rental cost inflation smoother higher than HICP inflation in low inflation periods.

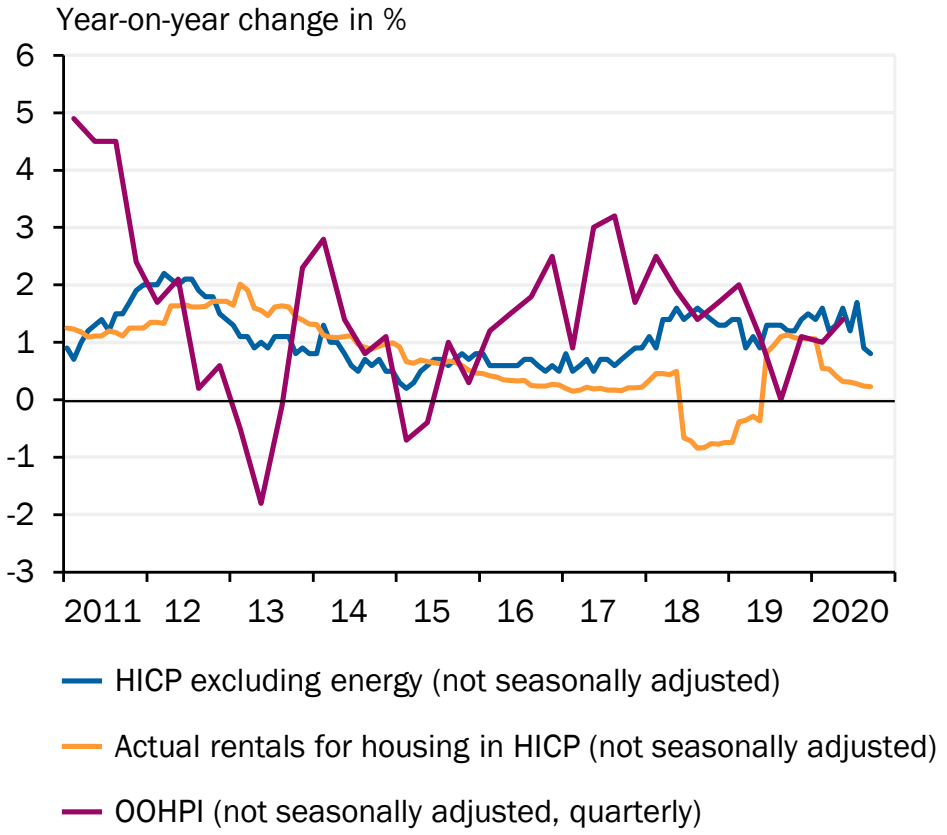
Owner-occupied housing index increased in Germany, quite variable, partly asset price of land.

Germany



Sources: Eurostat, own calculations

France



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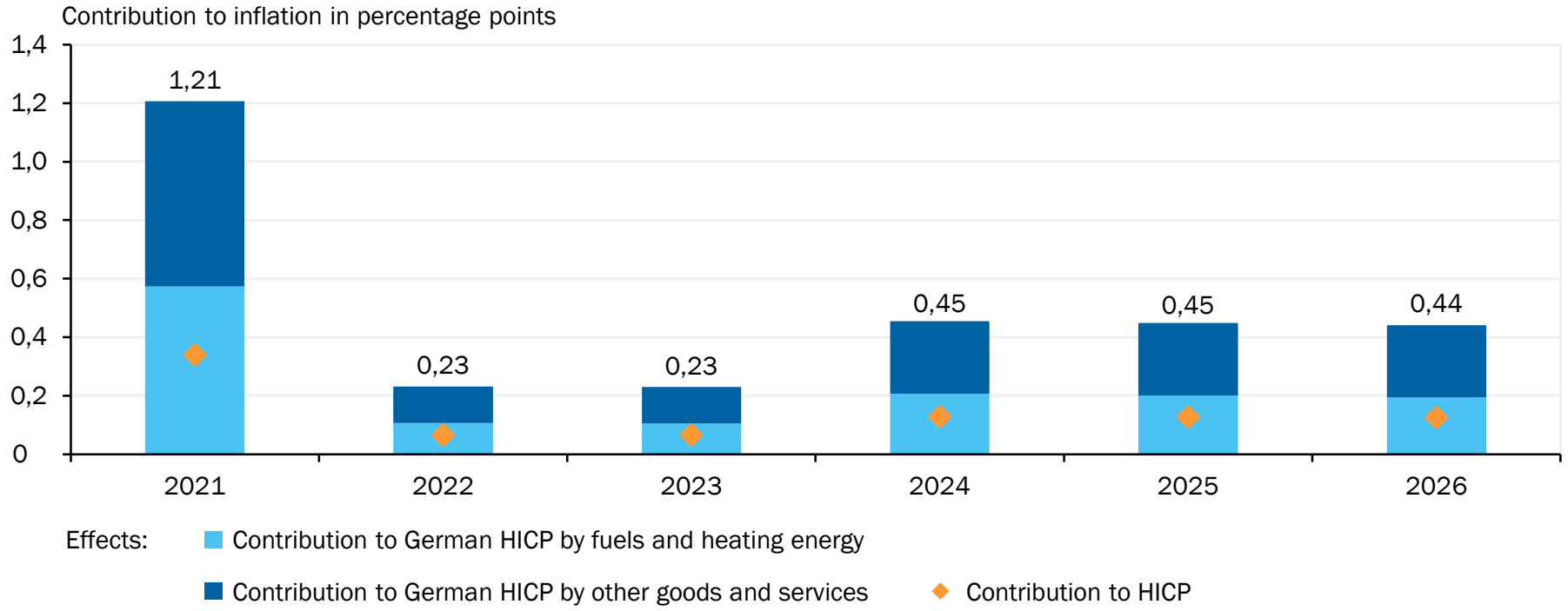
Anticipated increase of HICP inflation due to CO^2 Pricing for heating and mobility in Germany

Effects of German national emissions trading system on HICP between 2021 und 2026



Sources: Eurostat, Federal Statistical Office, RDC of the Federal Statistical Office and Statistical Offices of the Länder, Einkommens- und Verbrauchsstichprobe 2013 Grundfile 5 (HB), own calculations

Contribution to euro area HICP roughly 0.34 pp (0.17 direct effect) in 2021.

Possibly more like a cost-push shock.

Source: Nöh, Rutkowski and Schwarz, GCEE Working Paper 3/2020.

Policy at the ELB: Switching from interest rate to QE, while QE effects are uncertain.

π: inflation, π*: target, i: nominal interest rate, $i*$: nominal equilibrium rate, q: quantitative policy, e: shock, σ: variances.

$$(1) \qquad \pi_t = -a(i_t - i*) + bq_t + \pi_{t-1} + e_t \qquad b \sim N(\bar{b}, \sigma_b)\,, e_t \sim N(0, \sigma_e)$$

$$(2) \qquad \underset{i,q}{\text{Max}}\, E[-(\pi_t - \pi^*)^2] \;\Leftrightarrow\; \underset{i,q}{\text{Max}}(-(E\pi_t - \pi^*)^2 - V\pi_t)$$

$$(3)\ \text{if } i_t \geq i^{LB} \;\Rightarrow\; i_t = i* + \frac{1}{a}(\pi_{t-1} - \pi^*) \quad , \quad q_t = 0 \qquad E_t\pi_t = \pi^*$$

At ELB it may be optimal to have inflation converge more slowly to target from below, because of uncertainty …

π: inflation, π*: target, i: nominal interest rate, i^*: nominal equilibrium rate, q: quantitative policy, e: shock, σ: variances.

$$(4) \quad \text{if} \quad \pi_{t-1} < \pi^* + a(i^{LB} - i^*)$$

$$i_t = i^{LB} \ , \qquad q_t = -\frac{\bar{b}}{(\bar{b}^2 + \sigma_b)}(\pi_{t-1} - a(i^{LB} - i^*) - \pi^*)$$

$$\Rightarrow E\pi_t < \pi^*$$

Brainard (1967) on policy attenuation under multiplicative uncertainy and Orphanides & Wieland (2000) on optimal quantitative easing under uncertainty.

…, or because of the risk of side effects of QE,

z: side effects of QE, s: shock, σ: variances.

$$(5) \qquad z_t = cq_t + s_t \qquad c \sim N(0, \sigma_c)\,, s_t \sim N(0, \sigma_s)$$

$$(6) \qquad \underset{i,q}{\text{Max}}\, E[-(\pi_t - \pi^*)^2 - \lambda z^2]$$

$$(7) \qquad i_t = i^{LB}\ , \qquad q_t = -\frac{\bar{b}}{\left(\bar{b}^2 + \sigma_b + \lambda\sigma_c\right)}(\pi_{t-1} - a(i^{LB} - i^*) - \pi^*)$$

$$\Rightarrow\ E\pi_t < \pi^*$$

Factors that influence the constraint on interest rate policy.

$$(8)\quad [i_t - i^{LB}]_+ = \left[r^* + \pi^* + \frac{1}{a}(\pi_{t-1} - \pi^*) - i^{LB}\right]_+$$

$r^* \downarrow \quad \Rightarrow$ Interest rate policy more constrained.

$\pi^* \uparrow \quad \Rightarrow$ Depends! When at ELB it widens the distance to cover and requires even easier policy.

$i^{LB} \downarrow \quad \Rightarrow$ Interest rate policy less constrained.

π_{t-1}measurement $\uparrow \quad \Rightarrow$ Interest rate policy less constrained.

➔ Some conclusions for strategy

- Consider inflation more broadly in policy communication, not just HICP.
- Range as in “below but close to 2%” offers flexibility to include other measures in policy communication.
- At ELB it may be optimal to have inflation return to target more slowly due to uncertainty and side effects of QE.
- Raising inflation target when at ELB is tricky. Greater distance to target, requires easing policy further.
- Negative effect of lower r* at ELB may be offset by exploring potentially lower i^{LB}.