The Macroeconomic and Redistributive Effects of Shielding Consumers from Rising Energy Prices: the French Experiment

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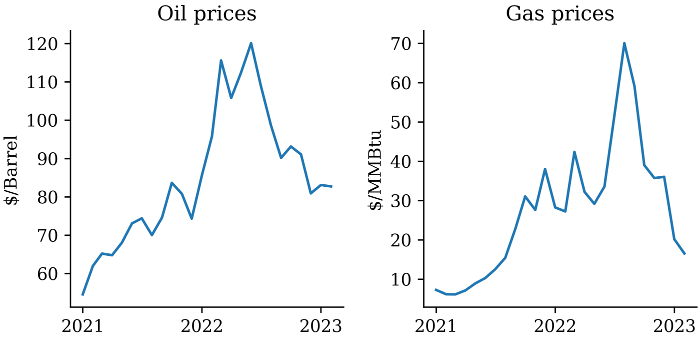
28 August 2023

On the European energy markets from 2021 to 2023

- the price of oil has doubled
- the price of gas has been multiplied by 5



World Bank Commodity Price Data

- **Growth forecasts have been revised downwards**

Forecasts 2021	2022	2023
France	6.2%	3.7%
Germany	3.3%	4.4%

⇐ Post-Covid recovery

Forecasts 2022	2022	2023
France	2.85%	1.0%
Germany	1.9%	1.7%

⇐ Russian invasion of Ukraine

- **With respect to its pre-crisis level (1.5% {2010 – 2018}), the inflation has significantly risen**

Realization	2022
France	5.9%
Germany	8.7%
Euro Area	8.2% Portugal (min without France) 11.6% Netherlands (max)

figure

- **France is an outlier: why?**

Macro impact: output growth & inflation

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Original policy: the "tariff shield". French government has put in place from the beginning of 2022

- a freezing of gas prices at their October 2021 levels,
- a capping of the increase in electricity prices,
- a discount at the gasoline pump as of April 2022

for an estimated cost of 110 billion € in 2022-2023 (the Debt-to-GDP ratio increases by +2.5 pp)

This paper:

- Why did government choose this policy among all those aimed at dampening the energy shock?
- Is there a better one?

The French experiment: tariff shield

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Objective: policy evaluation in real time

- To answer these questions, we need to develop a method allowing to evaluate in real time different policies aiming to damp the energy shock
- Why "in real time"?
- Because the parliament votes before the end of 2022 the government's budget for the year 2023.
  This budget law commits the government to its expenditures and receipts based on forecasts for 2023 to 2027 given its policy choices.

$\Rightarrow$ Governments need the economists to help them decide before the policy implementation

We propose a method to do that

Method: ex-ante evaluation

- Structural approach:
  - HANK with energy (Auclert et al. (2023), Pieroni (2023))
    * Since the “yellow vests” protests in France, the energy policy must care on inequality
    * HANK models generate a recession after an energy shock, contrary to RANK models (Auclert et al. (2023))
  - Estimated on French data, using conditional forecasts method (Del Negro & Schorfheide (2013))
- What role does the "tariff shield" play during this crisis?
  - What impact on aggregates?
  - What impact on inequalities?
- What other policies could be used, for what effectiveness?
  - Demand-driven policy: through redistributive transfers

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Model

- HANK model with one asset
- Discrete time and infinite horizon
- Energy is both a consumption good and an input for production
- The tariff shield is a subsidy on energy prices for households

Household consumption

The consumption basket is given by:

$$c = \left(\alpha_E^{\frac{1}{\eta_E}} (c_{FE} - \underline{c}_{FE})^{\frac{\eta_E - 1}{\eta_E}} + (1 - \alpha_E)^{\frac{1}{\eta_E}} (c_H)^{\frac{\eta_E - 1}{\eta_E}} \right)^{\frac{\eta_E}{\eta_E - 1}}$$

where $\underline{c}_{FE}$ is an incompressible energy consumption level

The consistent definition of the Consumer Price Index P is:

$$P = \left[\alpha_E((1 - s_H) P_{FE})^{1-\eta_E} + (1 - \alpha_E) P_H^{1-\eta_E} \right]^{\frac{1}{1-\eta_E}}$$

where s_H is the tariff shield

Household problem

$$
\begin{aligned}
V_t(e, a_-) &= \max_{c,a} \left\{ u(c) - v(n) + \beta \sum_{e'} V_{t+1}(e', a)\mathcal{P}(e, e') \right\} \\
(1+\tau_c)c + a &= (1+r_t)a_- + (1-\tau_l)wen + \tau\bar{\tau}(e) + d\bar{d}(e) \\
& \quad -(1+\tau_c)(1-s_H)p_{FE}\underline{c}_{FE} \\
a &\geq 0
\end{aligned}
$$

where:

- real interest rate: $1 + r_t = \frac{1+i_{t-1}}{1+\pi_t}$
- $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$ and $v(n) = \theta \frac{n^{1+\nu}}{1+\nu}$
- τ_c: Value-added tax (VAT); τ_l: labor income tax
- $\bar{\tau}(e)$ decreasing with e, $\bar{d}(e)$ increasing with e
  Transfers decline (financial revenues increases) with earnings

Intermediate goods producers: price takers details

Produces a home good using energy E and labor N:

$$Y_H \leq Z\left(\alpha_f^{\frac{1}{\sigma_f}} E^{\frac{\sigma_f-1}{\sigma_f}} + (1-\alpha_f)^{\frac{1}{\sigma_f}} N^{\frac{\sigma_f-1}{\sigma_f}}\right)^{\frac{\sigma_f}{\sigma_f-1}}$$

Final good producers: price takers details

Combines Y_H and Y_{FE} to satisfy the households' preferences:

$$Y_F = \left(\alpha_E^{\frac{1}{\eta_E}} Y_{FE}^{\frac{\eta_E-1}{\eta_E}} + (1-\alpha_E)^{\frac{1}{\eta_E}} Y_H^{\frac{\eta_E-1}{\eta_E}}\right)^{\frac{\eta_E}{\eta_E-1}}$$

Retailers differentiates the product by putting a mark on it.

They are price makers details

Using Y_F, each monopolistic retailer produces $Y(i)$ goods

Goods are imperfectly substitutable: $Y = \left(\int Y(i)^{\frac{\varepsilon_d-1}{\varepsilon_d}} di\right)^{\frac{\varepsilon_d}{\varepsilon_d-1}}$

Price rigidity. Assuming price rigidity à la Rotemberg, we derive a first NKPC:

$$\pi_t = \kappa_P \left(mc_t - \frac{1}{\mu} \right) + \frac{1}{1 + r_{t+1}} \frac{Y_{t+1}}{Y_t} \pi_{t+1}$$

with $mc_t = \frac{P_{Ft}}{P_t}$, $\kappa_P = \frac{\varepsilon_d}{\psi_P}$ and $\mu = \frac{\varepsilon_d}{\varepsilon_d - 1}$ details

Wage rigidity. Assuming that a union sets nominal wage and support an adjustment cost when it changes the nominal wage, we derive the second NKPC:

$$\pi_{Wt} = \kappa_w \left(N_t v'(N_t) - \frac{1}{\mu_w} \frac{1 - \tau_l}{1 + \tau_c} w_t N_t u'(C_t) \right) + \beta \pi_{Wt+1}$$

with $\mu_w \equiv \frac{\varepsilon}{\varepsilon - 1}$ and $\kappa_w \equiv \frac{\varepsilon}{\psi_W}$ details

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Government collects revenues (R_t) and incurs expenditure (S_t):

$$R_t = \underbrace{\tau_{lt} w_t N_t}_{\text{Labor taxes}} + \underbrace{\tau_{ct}(C_t + p_{FEt}\underline{c}_{FE})}_{\text{Consumption taxes}}$$

$$S_t = G_t + \tau_t + \underbrace{s_{Ht} p_{FEt}(Y_{FEt} + (1+\tau_{ct})\underline{c}_{FE})}_{\text{tariff shield}}$$

Differences between R and S is financed by issuing public debt:

$$b_t = (1 + r_t) b_{t-1} - R_t + S_t \quad \text{real public debt}$$

Taylor rule of the ECB with respect to the French inflation:

$$i_t = \rho_r i_{t-1} + (1-\rho_r)(r_{ss} + \underbrace{\phi_\pi(\mu_{FR} + (1-\mu_{FR})\rho_\pi)}_{<\phi_\pi}\pi_t) + \varepsilon_t$$

where $\varepsilon_t = \widetilde{\varepsilon}_t + \phi_\pi(1-\rho_r)(1-\mu_{FR})\pi_t^{REU*}$, $corr(\pi_t^{REU*}, \pi_t) = 0$

Market clearing

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Market clearing

Quantitative method: Ex ante (“real time”) policy evaluation

- **Objective:**
  - to propose a method for “real time” policy evaluation
  - because, the parliaments of all countries vote the government’s budget before the implementation of reforms, we develop a method for a “real time” evaluation
- **Identification strategy**
  - Given calibrated parameters for the steady state
  - our HANK model reproduces the government forecasts (output, inflation and public debt)
  - conditionally to
    - government’s policies (expenditures and receipts)
    - energy prices

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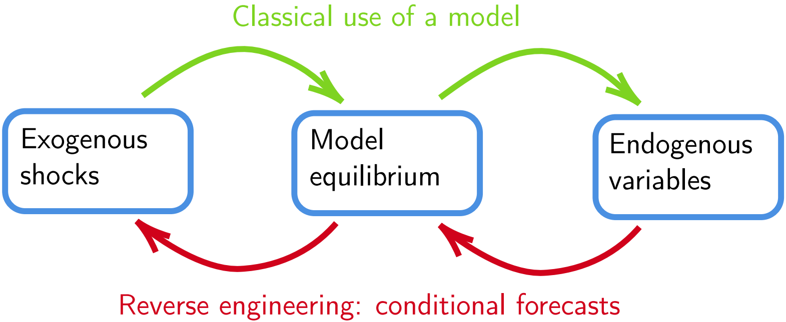
Reverse engineering

- We reveal the shocks that make consistent model's variables to government's forecasts



- These shocks are then considered as invariant: with these same shocks (all other things being equal), would another policy have done better?

Estimation

1. The selected time series targeted data

$$\Theta = \left\{ Y_t, \pi_t, b_t, p_{FE,t}, G_t, T_t \right\}_{t=4Q2019}^{4Q2027} \quad \text{blue: exogenous}$$

2. Define the exogenous shocks

$$\Psi = \left\{ \epsilon_t^{\beta}, \epsilon_t^{\mu}, \epsilon_t^{\vartheta}, \epsilon_t^{P_{FE}}, \epsilon_t^{G}, \epsilon_t^{T} \right\}_{t=4Q2019}^{4Q2027} \quad \text{blue: exact mapping}$$

⇒ Reveal the time-specific realizations of Ψ in order to fit Θ

3. Solution for Ψ are obtained thanks to details
   - a first-order approximation (Reiter (2009), (2010))
   - Sequence-space Jacobian approach (Auclert et al. (2021))
4. Given the solution for Ψ, we change policy rules to build counterfactual scenarios

calibration | Propensity to consume | Shock decomposition | Uncertainty

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Impact of the tariff shield on aggregates

Scenario	GDP growth 2022	GDP growth 2023	Inflation rate 2022	Inflation rate 2023	Debt-to-GDP ratio Long-term (2027)
No tariff shield	**1.18%**	**0.92%**	**7.5%**	**3.5%**	**110.7%**
Tariff shield in 2022 and 2023	2.85%	1.00%	6.5%	3.4%	112.5%
	(+1.67pp)	(+0.08pp)	(-1.1pp)	(-0.1pp)	(+1.8pp)
Tariff shield only in 2022	2.85%	0.57%	6.5%	3.8%	112.8%
	(+1.67pp)	(-0.35pp)	(-1.0pp)	(+0.3pp)	(+2.1pp)

Without the tariff shield : strong inflationary pressures

- strong wage increases
  $\Rightarrow$ lower growth, via a rise in labor costs reducing employment
- rise in interest rates
  $\Rightarrow$ brake on activity
- Stable debt

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Tariff shield in 2022 and 2023

- 2022: growth remains high $\Leftarrow$ end of Covid catch-up
  2023: weak growth due to the energy crisis
- 2022: -1.1pp inflation, period of sharp rise in energy prices
  2023: -0.1pp inflation, expected drop in energy prices
- cost = Debt-to-GDP ratio +1.8pp

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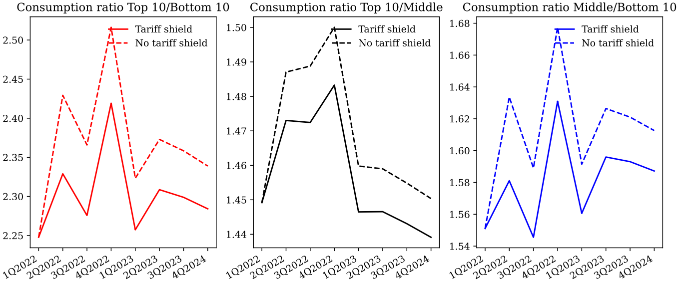
Tariff shield only in 2022

- mechanical effect in 2023: inflationary because prices are no longer "subsidized"
- modest inflation effects: the 2022 shield braked the price-wage spiral (powerful when energy prices rise)
- cost = Debt-to-GDP ratio +2.1pp

Inequalities: the tariff shield is progressive



		Top/Bottom	Top/Middle	Middle/Bottom
Data		3	1.97	1.52
Model	$\frac{C(T10)}{C(B10)}$	2.38 $\rightarrow$ 2.30	1.455 $\rightarrow$ 1.44	1.63 $\rightarrow$ 1.59
	Δ	-3%	-1%	-2.5%

INSEE data (household budget survey)

$\downarrow$ **inequality:** the poorer the agents, the less they can substitute energy and the higher the share of energy in their consumption: the tariff shield is therefore more favorable to the poorest behaviors

An alternative policy: redistributive policy

Replace the tariff shield by transfers to households aiming at compensating for the incompressible energy consumption

- Incompressible energy consumption represents around 20% of households' energy consumption
- Cost of the measure: 25% of the tariff shield
- The same amount is given to everybody but this represents a higher share of consumption for the bottom of the distribution $\Leftrightarrow$ **redistribution**

Decile	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
Incompressible energy cons. % of E. Conso.	31%	26%	24%	21%	20%	19%	17%	18%	16%	14%

Effectiveness of a redistributive policy details

Scenario	GDP growth 2022	GDP growth 2023	Inflation rate 2022	Inflation rate 2023	Debt-to-GDP ratio Long-term (2027)
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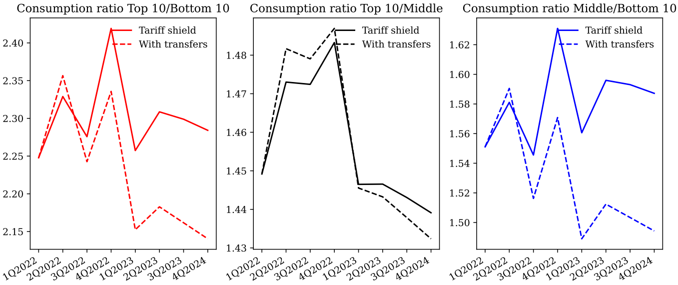
Tariff shield in 2022 and 2023	2.85%	1.00%	6.5%	3.4%	112.5%
	(+1.67pp)	(+0.08pp)	(-1.1pp)	(-0.1pp)	(+1.8pp)
Transfers	**1.70%**	**1.28%**	**7.9%**	**5.0%**	**119.3%**
	(+0.52pp)	(+0.36pp)	(+0.4pp)	(+1.5pp)	(+8.6pp)

Transfers versus tariff shield

- More inflationary (price-wage spiral more active)
- Less effective on growth (-1 point over 2 years); labor costs $\uparrow$
- Even with a lower ex-ante cost, weak growth and high ECB rate (inflation) rising debt burden $\Rightarrow \uparrow$ debt-to-GDP ratio

Impact of a redistributive policy on inequalities



- **Relatively to tariff shield**, transfers reduce more inequalities at the bottom: $\frac{C(T10)}{C(B10)}$: $2.31 \rightarrow 2.18 \approx$ -5%
- **Why?** Stronger support for the consumption of the poorest because, with a greater propensity to consume, they are very sensitive to transfers.

Conclusion

- "Tariff shield" is **very efficient**
  - to support growth
  - to reduce inflation
  - to damp inequality
- Can we do better than the "tariff shield"?
  No, without sacrificing growth, having more inflation and further increasing the debt-to-GDP ratio
  - Remark: a policy encouraging to index wage on price more quickly is not desirable details
- **Cost**: 58 billion in 2022 and 52 billion in 2023
  $\Rightarrow$ 2.5 points Debt/GDP

The "hidden" costs of the “tariff shield”

- **Free-rider problem**
  - If all countries had implemented a tariff shield, then the energy price would have increase more, canceling the effect of policy (Auclert et al. (2023))
  - But for this crisis, which seems to be a one shot game, France has played first and quicker (opportunistic reaction)
- **Pollution**
  - After the tariff shield, the carbon tax should be increased in France to respect international commitments
  - ...with the risk of new “yellow vest” protests!

“Making environmental policies acceptable” (Langot et al. (2023))

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Size of the energy shock back

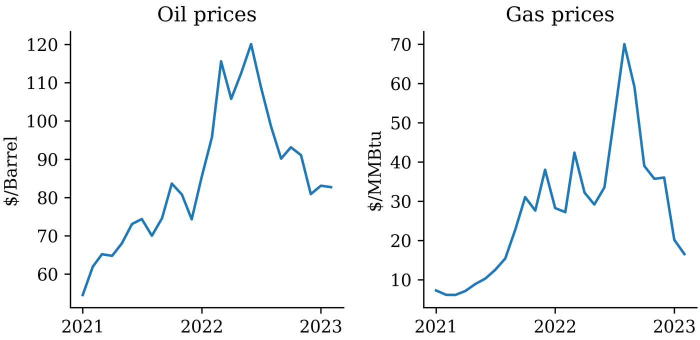


Figure: European oil and gas prices. *World Bank Commodity Price Data*

Inflation back

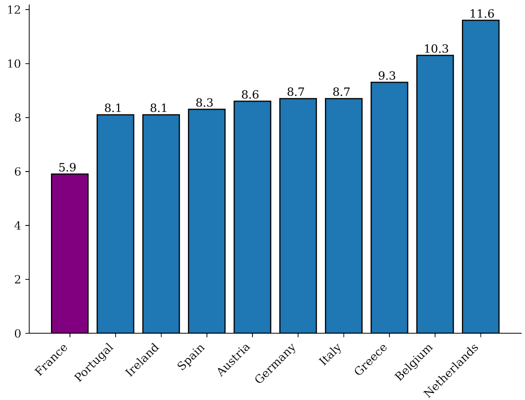


Figure: Euro area inflation 2022 (% yoy). *Source: Eurostat, DBnomics*

French tariff shield back

French policy: for high costs for public finance (approximately 100 billion), government has subsided energy:

- Electricity tariffs have increased by only 4% in 2022 and 15% in 2023
- Gas tariffs have increased by only 15%
- 30-cent reduction at the pump from September 1, 2022 to November 15, 2022;
  10 cents afterwards until December 31, 2022

$$\min_{E,N} \quad \{WN + (1-s_F)P_{FE}E\}$$

$$s.t. \quad Y_H \leq Z\left(\alpha_f^{\frac{1}{\sigma_f}} E^{\frac{\sigma_f - 1}{\sigma_f}} + (1-\alpha_f)^{\frac{1}{\sigma_f}} N^{\frac{\sigma_f - 1}{\sigma_f}}\right)^{\frac{\sigma_f}{\sigma_f - 1}}$$

The optimal demands of production factors are:

$$N = (1-\alpha_f)\left(\frac{W}{MC_H}\right)^{-\sigma_f} Y_H$$

$$E = \alpha_f\left(\frac{(1-s_F)P_{FE}}{MC_H}\right)^{-\sigma_f} Y_H$$

Intermediate goods (2)

The marginal cost is defined as follows

$$MC_H = Z^{-\frac{1}{\sigma_f}} \left(\alpha_f((1-s_F)P_{FE})^{1-\sigma_f} + (1-\alpha_f)W^{1-\sigma_f}\right)^{\frac{1}{1-\sigma_f}}$$

Assuming perfect competition, profits and free entry condition leads to

$$\begin{aligned} MC_H &= P_H \\ mc_H &= p_H \end{aligned}$$

back

$$\min_{Y_H, Y_{FE}} \quad \{P_H Y_H + (1 - s_H) P_E Y_{FE}\}$$

$$s.t. \qquad Y_F \leq \left(\alpha_E^{\frac{1}{\eta_E}} (Y_{FE})^{\frac{\eta_E - 1}{\eta_E}} + (1 - \alpha_E)^{\frac{1}{\eta_E}} (Y_H)^{\frac{\eta_E - 1}{\eta_E}} \right)^{\frac{\eta_E}{\eta_E - 1}}$$

The optimal decisions satisfy

$$Y_{FE} = \alpha_E \left(\frac{(1 - s_H) P_{FE}}{MC_F} \right)^{-\eta_E} Y_F$$

$$Y_H = (1 - \alpha_E) \left(\frac{P_H}{MC_F} \right)^{-\eta_E} Y_F$$

The marginal cost is

$$MC_F = \left(\alpha_E((1-s_H)P_E)^{1-\eta_E} + (1-\alpha_E)\left(P_H\right)^{1-\eta_E}\right)^{\frac{1}{1-\eta_E}}.$$

Assuming perfect competition, profits and free entry condition leads to

$$\begin{aligned} MC_F &= P_F \\ mc_F &= p_F \end{aligned}$$

back

Retailers Using Y_F, each monopolistic retailer produces $Y(i)$ goods:

$$\Pi_t(P_{i,-}) = \max_{P_i} \left\{ \frac{P_i - P_F}{P} Y(i) - \frac{\psi_P}{2} \left(\frac{P_i}{P_{i,-}} - 1 \right)^2 Y + \frac{1}{1+r_+} \Pi_{t+1}(P_i) \right.$$

$$\text{s.t. } Y(i) = \left(\frac{P_i}{P} \right)^{-\varepsilon_d} Y \quad \text{with} \quad Y = \left(\int Y(i)^{\frac{\varepsilon_d - 1}{\varepsilon_d}} di \right)^{\frac{\varepsilon_d}{\varepsilon_d - 1}}$$

This leads to the following NKPC:

$$\pi_t = \kappa_P \left(mc_t - \frac{1}{\mu} \right) + \frac{1}{1+r_{t+1}} \frac{Y_{t+1}}{Y_t} \pi_{t+1}$$

with $mc_t = \frac{P_{Ft}}{P_t}$, $\kappa_P = \frac{\varepsilon_d}{\psi_P}$ and $\mu = \frac{\varepsilon_d}{\varepsilon_d - 1}$.

The firm profit (its dividends) is defined by

$$D_t = P_t Y_t - P_{Ft} Y_{Ft} - \frac{\psi_P}{2} \left(\frac{P_t}{P_{t-1}} - 1 \right)^2 P_t Y_t,$$

knowing that with a linear production, we have $Y_t = Y_{Ft}$.

A union sets a unique wage by task k whatever the levels of productivity e and wealth a. The union's program is:

$$
\begin{aligned}
U_t^k(W_{k,-}) &= \max_{W_k} \int_e \int_a [u(c(e,a)) - v(n(e,a))]\, d\Gamma(a,e) \\
&\quad - \frac{\psi_W}{2}\left(\frac{W_k}{W_{k,-}} - 1\right)^2 + \beta U_{t+1}^k(W_k) \\
&\quad \text{s.t. } N_k \left(\frac{W_k}{W}\right)^{-\varepsilon} N \quad \text{with} \quad W = \left(\int_k W_k^{1-\varepsilon} dk\right)^{\frac{1}{1-\varepsilon}}
\end{aligned}
$$

This decision of the nominal wage leads to a New-Keynesian Phillips curve:

$$
\pi_{Wt} = \kappa_w \left(N_t v'(N_t) - \frac{1}{\mu_w} \frac{1-\tau_l}{1+\tau_c} \frac{W_t}{P_t} N_t u'(C_t) \right) + \beta \pi_{Wt+1}
$$

with $\mu_w \equiv \frac{\varepsilon}{\varepsilon - 1}$ and $\kappa_w \equiv \frac{\varepsilon}{\psi_W}$.

Equilibrium back

The market clearing conditions are:

Asset market: $b = \mathcal{A} \equiv \int_{a_-} \int_e a(a_-, e) d\Gamma(a_-, e)$

Labor market: $N = \mathcal{N} \equiv \int_{a_-} \int_e n(a_-, e) d\Gamma(a_-, e)$

Energy market: $\overline{E} = \mathcal{E} \equiv Y_{FE} + \underline{c}_{FE} + E$

Good market: $Y \left(1 - \frac{\psi_P}{2}\pi^2\right) = p_{FE}\overline{E} + \mathcal{C} + G$

Using solution for the dynamics of the general equilibrium,

- response to aggregate shocks obtained thanks to a first-order approximation around the steady-state: Reiter (2009), Reiter (2010).
- sequence-space Jacobian approach: Auclert et al. (2021)

  Complete Jacobian of the dynamic system G

  AR(1) shock: $dZ_t = \sum_{s=0}^{\infty} \mathbf{m}_s^Z \varepsilon_{t-s}^Z$

  Response: $dY_t = \sum_{s=0}^{\infty} \sum_{\text{shock } z} \left[G^{Y,z} \mathbf{m}^z \right]_s \varepsilon_{t-s}^z$

back

$$\mathbf{H}_t(\mathbf{Y},\mathbf{Z}) \equiv \begin{pmatrix} \Phi(S_{t+1}, S_t, S_{t-1}) \\ \mathcal{A}_t - b_t \\ \mathcal{N}_t - N_t \\ \mathcal{E}_t - \overline{E} \end{pmatrix} = 0$$

where $\mathbf{Y}$ gathers the time series of unknown aggregate variables and $\mathbf{Z}$ of exogenous aggregate shocks.

$\Phi(S_{t+1}, S_t, S_{t-1}) = 0$ is the system gathering all the equations describing the firms, unions, government and central bank behaviors. S is the vector of aggregates they control. back

Sequence-space Jacobian

Differentiating the previous equation:

$$0 = \sum_{s=0}^{\infty} [H_Y]_{t,s} dY_s + \sum_{s=0}^{\infty} [H_Z]_{t,s} dZ_s$$

$$\text{where} \quad [H_Y]_{t,s} \equiv \frac{\partial H_t}{\partial Y_s} \quad \text{and} \quad [H_Z]_{t,s} \equiv \frac{\partial H_t}{\partial Z_s}$$

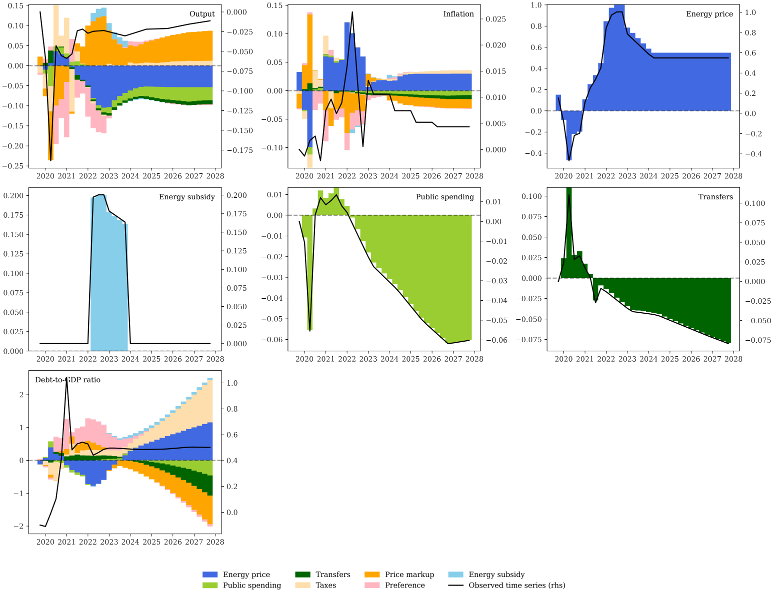
$$\Rightarrow \quad dY = -H_Y^{-1} H_Z dZ = G dZ$$

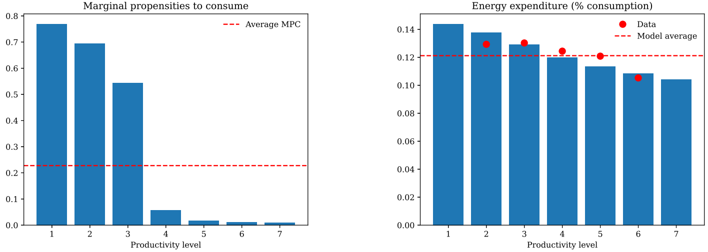
where G is the complete Jacobian of the dynamic system. back

Calibration back

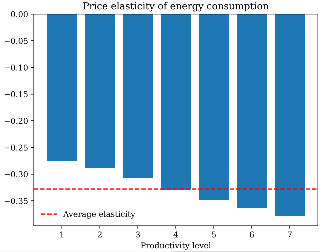
Parameter	Value	Target
Preferences		
Discount factor β	0.9922	Real interest rate $r = 0.5\%$ per quarter
Disutility of labor θ	0.6343	Aggregate labor $L = 1$
Frisch elasticity of labor supply φ	0.5	Auclert el al (2020)
Elasticity of intertemporal substitution σ	1	Log-utility
Incompressible energy consumption $\underline{c}$	0.0370	20% of the households' energy consumption
Wage markup μ_w	1.1	Auclert el al (2020)
Elasticity of substitution between production inputs η_E	0.5	Negative impact on GDP of energy price shock
Share parameter (energy, intermediate good) α_E	0.025	Sharing rule: an half of energy to households
Production		
Elasticity of substitution between production inputs σ_f	η_E	Simplifying assumption
Share parameter (energy, labor) α_f	0.075	Sharing rule: an half of energy to firms
Firm markup μ	1.2	Auclert el al (2020)
Aggregate targets		
Share of GDP spent on energy se	3.18%	Share of energy in GDP
Public debt B	4.749	Debt-to-GDP ratio 100% with annual GDP
Public spending G	0.2374	Public spending-to-GDP ratio 20%
Transfers	0.2968	Transfers-to-GDP ratio 25%
VAT rate τ_c	20%	French VAT
Income tax rate τ_l	20%	French employee tax rate
Nominal rigidity		
Price rigidity κ	0.95	Arbitrary lower than Auclert et al (2018)
Wage rigidity κ_w	0.1	Auclert et al (2018)
Monetary policy		
Taylor rule coefficient $\phi_\pi(\mu_{FR} + (1-\mu_{FR})\rho_\pi))$	1.2	With $\phi_\pi = 1.5$ and $\mu_{FR} = 20\%$, the $\rho_\pi = 0.75$
Persistence of monetary policy ρ_r	0.85	Carvalho et al (2021)
Heterogeneity		
Persistence of productivity shocks ρ	0.966	Fonseca et al. (2023) data for France
Volatility of productivity shocks σ	0.5	preliminary values: to match consumption inequalities

Estimation (focus on 4Q2020 onwards) back

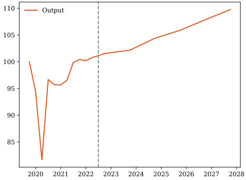




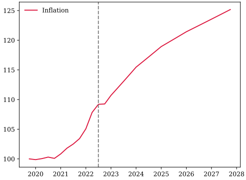
(a) **Marginal Propensity to Consume** (b) **Energy share in consumption**



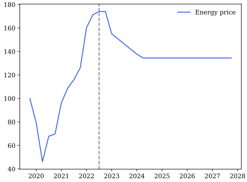
Data: Observed and forecasts (4Q2019=100) back



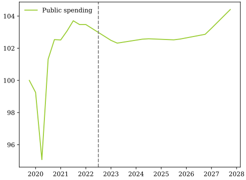
(a) GDP



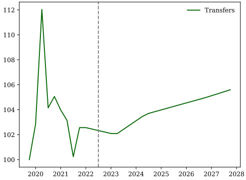
(b) GDP Price Index



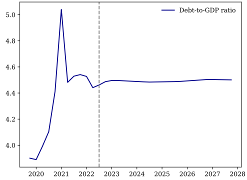
(c) Energy Price Index



(d) Gov. expenditures



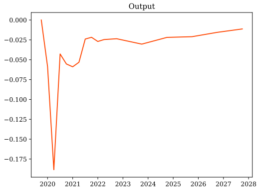
(e) Gov. transferts



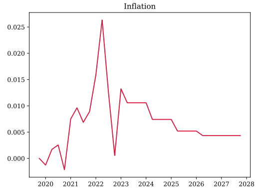
(f) Debt over GDP

Stationarized data

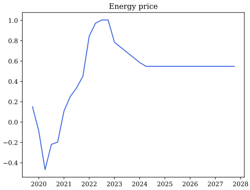
back



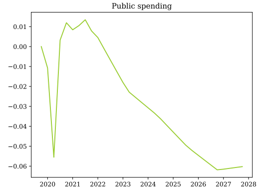
(a) $\frac{GDP_t}{1.0032^t}\frac{1}{100}-1$



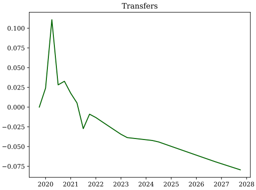
(b) $\frac{P_t - P_{t-1}}{P_{t-1}}$



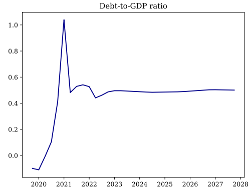
(c) $\frac{P_E \text{ Index}_t - 86.819}{86.819}$



(d) $\frac{G_t}{1.0033^t}\frac{1}{100}-1$

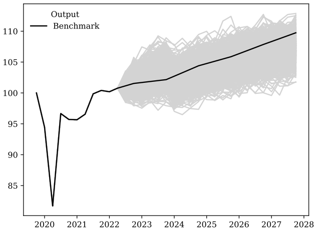


(e) $\frac{T_t}{1.0043^t}\frac{1}{100}-1$

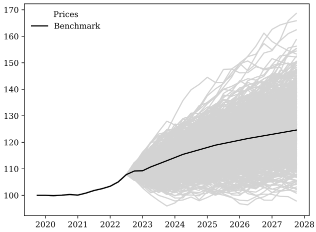


(f) $\frac{B_t}{GDP_t}-4$

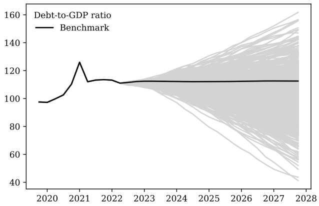
Uncertainty: Confidence band for forecasts back



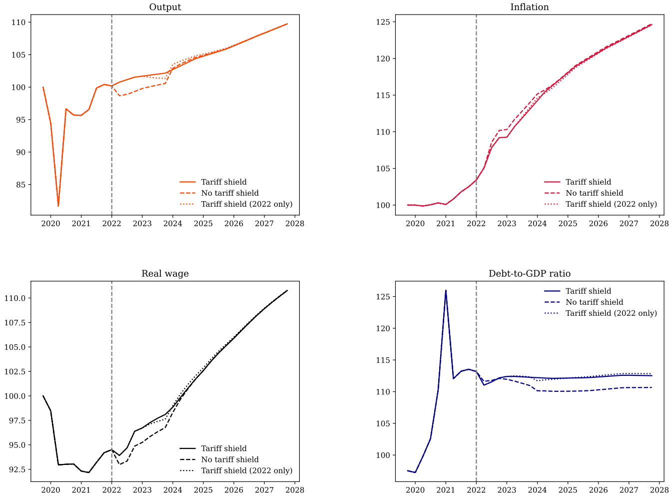
(a) GDP



(b) Consumer Price Index



Impact of the tariff shield



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Would wage indexation increase the effectiveness of the tariff shield?

From 2022, nominal wages adjust yearly to changes in inflation.

Scenario	GDP growth 2022	GDP growth 2023	Inflation rate 2022	Inflation rate 2023	Inequality evolution	Debt-to-GDP ratio Long-term (2027)
No tariff shield	1.18%	0.92%	7.5%	3.5%	Increase	110.7%
Tariff shield in 2022 and 2023	2.85%	1.0%	6.5%	3.4%	Decrease	112.5%
Tariff shield only in 2022	2.85%	0.57%	6.5%	3.8%	Decrease	112.8%
Transfers	1.70%	1.28%	7.9%	5.0%	Decrease	119.3%
Wage indexation on prices	2.01%	0.40%	8.0%	4.8%	Decrease	115.1%

details

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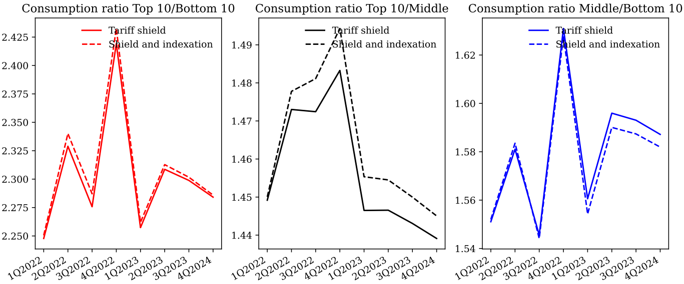
Impact of wage indexation on inequalities



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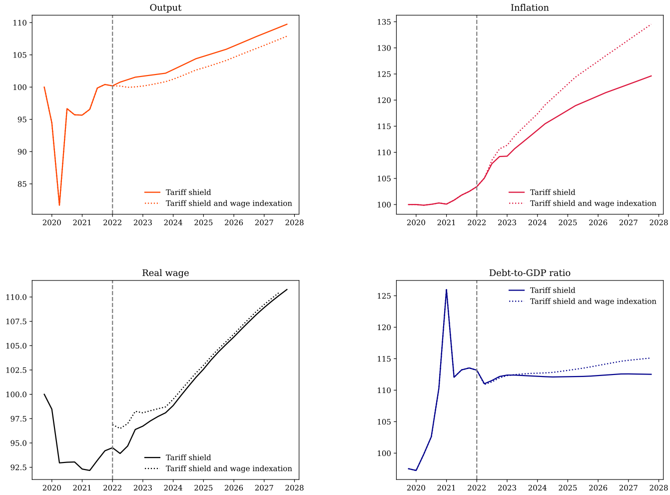
Impact of the tariff shield and wage indexation



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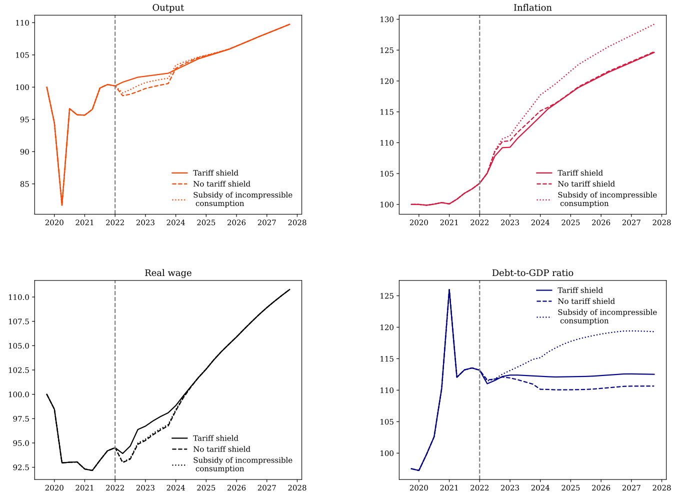
Impact of a redistributive demand policy



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