

Greed? Profits, Inflation, and Aggregate Demand

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Greed: Inflation and Inequality

- ▶ return of inflation: "greed", profits (markups), "sellers' inflation"
- ▶ intimately related to distributional considerations
 - ▶ benefit the "rich", hurt poor twice (also erodes wages)
- ▶ "demand" component: inflation *beyond* cost increase
 - ▶ *aggregate-demand* amplification of recession
- ▶ = **comovement of: inflation, profits, aggregate demand**
- ▶ policy speeches: Lagarde, Schnabel; President Biden, IRA anniversary: "*one reason we've seen inflation fall by two thirds without losing jobs is corporate profits are coming back down to earth.*"

Finance and economics | Capital v labour

Are greedy corporations causing inflation?

That is the popular narrative. Yet there is reason to doubt it



IMAGE: GETTY IMAGES
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The Guardian view on corporate greed: it's causing inflation

Editorial

Sun 12 Mar 2023 18.25 GMT

Unite's claim that firms are profiteering on the back of a crisis hitting workers is hard to dismiss



Literature

- ▶ sticky wages and profits in (RA-)NK transmission
 - ▶ **Christiano Eichenbaum Evans** 1997, 2005; *markups*: Nekarda Ramey; Burstein Carvalho Grassi
 - ▶ Erceg Henderson Levin, Schmitt-Grohe Uribe, Galí
 - ▶ Bilbiie Melitz 2020 (without and with *free* entry)
- ▶ TANK flex-wage: Galí Lopez-Salido Vallés 2007, **Bilbiie 2008**, Bilbiie 2020, Debortoli Galí 2018
 - ▶ sticky-wage extensions of Bilbiie 2008: Colciago 2011, Furlanetto 2011, **Ascari Colciago Rossi** 2017; Diz Giarda Romero 2023
- ▶ HANK sticky-wage role for transmission:
 - ▶ Broer Harbo-Hansen Krusell Oberg; Hagedorn Manovskii Mitman; Auclert Bardoczy Rognlie; Auclert Rognlie Straub; Alves Kaplan Moll Violante; Bilbiie Känzig Surico
- ▶ "sellers' inflation": Lerner; Weber and Wasner

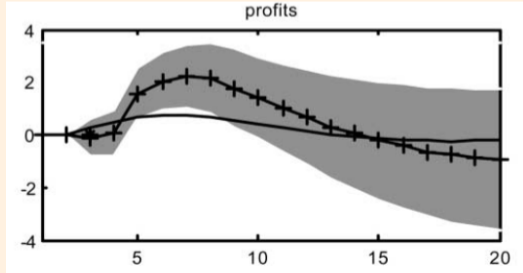
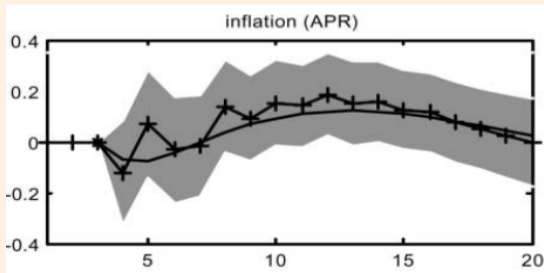
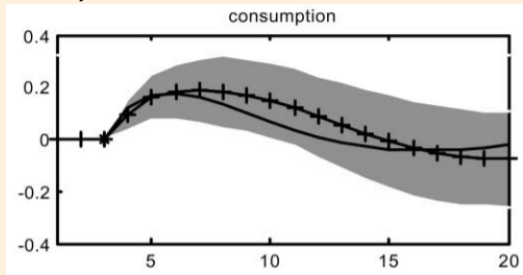
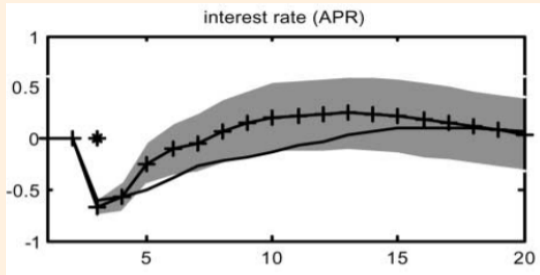
Starting Point

- ▶ standard sticky-price (RA-)NK model implies the **opposite**
- ▶ profits *negatively* related to demand → **Deflation!**

$$\pi_t = -\psi_p d_t$$

- ▶ *novel* analytical condition for demand-procyclical, inflationary profits:
- ▶ *sticky-enough* nominal wages

Christiano Eichenbaum Evans JPE 2005



Supply Shocks?

- ▶ profits *supply*-procyclical even w/ sticky P only, no puzzle
 - ▶ TFP $\downarrow \longrightarrow mc \uparrow \longrightarrow d \downarrow$ in a "recession" ($y \downarrow$)
- ▶ However:
 1. still puzzling π : TFP $\downarrow \longrightarrow \pi \uparrow$ negative comovement (d, π)
 - \rightarrow positive (d, π) correlation needs to be driven by something else (focus on *demand shocks*)
 2. separate issue: supply shocks \nrightarrow recession \equiv negative output **gap**
 - \rightarrow to fix, *endogenous entry-exit*, Bilbiie Melitz 2020

RANK Baseline: Sticky Prices & Wages

- ▶ DRS $c_t = y_t = (1 - \alpha) n_t$, gross markup post-subsidy \mathcal{M}
- ▶ Given Aggregate Demand e.g fixed real rate $\rightarrow c_t = E_t c_{t+1} - \sigma r_t$
- ▶ Loglinearized profits and marginal cost (= -markup):

$$d_t = y_t - \frac{1 - \alpha}{\mathcal{M}} (w_t + n_t) = \left(1 - \frac{1}{\mathcal{M}}\right) c_t - \frac{1 - \alpha}{\mathcal{M}} w_t$$

$$mc_t = -\mu_t = w_t + \frac{\alpha}{1 - \alpha} c_t.$$

- ▶ Static Phillips curve wlog (Bilbiie 2017, 2019, etc.)

$$\pi_t = \psi_p mc_t = \psi_p \left(w_t + \frac{\alpha}{1 - \alpha} c_t \right)$$

$$\pi_t^w = w_t - w_{t-1} + \pi_t = \psi_w \left(\sigma^{-1} c_t + \varphi n_t - w_t \right)$$

- ▶ Combine \rightarrow Profits' dynamics:

Sticky Wages and Profits' Cyclicity in RANK

$$d_t = \frac{\mathcal{M} - 1 + \Omega}{\mathcal{M}} c_t - \frac{1 - \alpha}{\mathcal{M}} \Theta w_{t-1}$$

- ▶ Profits' cyclicity determinant:

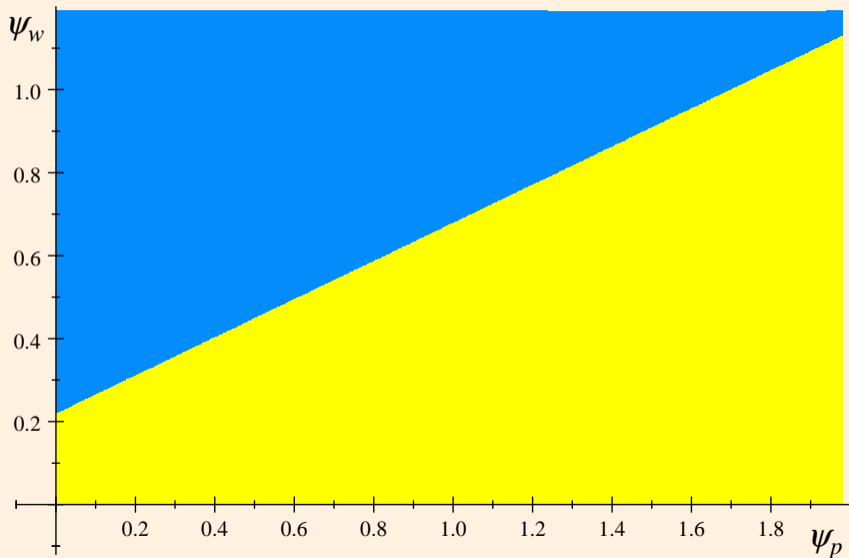
$$\Omega \equiv \left[\psi_p \alpha - \psi_w \left(\sigma^{-1} (1 - \alpha) + \varphi \right) \right] \Theta$$

- ▶ Endogenous persistence $\Theta \equiv \left(1 + \psi_p + \psi_w \right)^{-1}$ iff both P & W sticky
- ▶ **Proposition:** Profits procyclical wrt demand $\frac{\partial d_t}{\partial c_t} > 0$ iff:

$$\mathcal{M} - 1 + \Omega > 0 \rightarrow \frac{\psi_w \left[(1 - \alpha) \sigma^{-1} + \varphi \right] - \alpha \psi_p}{1 + \psi_p + \psi_w} < \mathcal{M} - 1$$

- ▶ two contradicting forces, procyclical if wage-stickiness-induced procyclicality dominates
 - ▶ see Cantore et al 2021 for an earlier related result on the labor share

W & P stickiness for *procyclical profits* (yellow) $\alpha = .33$ $\varphi = 1$ $\sigma = 1$ $M = 1.3$



Inflation Dynamics: PC with Profits

- ▶ Assume *wlog* optimal subsidy $\mathcal{M} = 1 \rightarrow \Omega = \text{cyclicality}$

$$d_t = \Omega c_t + \Theta d_{t-1}$$

- ▶ Modified PC ($\Omega \in [0, \alpha]$ restriction)

$$\pi_t = \psi_p \frac{\alpha}{1 - \alpha} c_t - \psi_p \frac{1}{1 - \alpha} d_t$$

- ▶ Note: endogenous persistence

$$\pi_t = \Theta \pi_{t-1} + \frac{\psi_p}{1 - \alpha} (\alpha - \Omega) c_t - \alpha \frac{\psi_p}{1 - \alpha} \Theta c_{t-1}$$

- ▶ Different AD models $\rightarrow c_t \rightarrow$ inflation; **RANK useful benchmark!**
- ▶ How to get an inflation surge + profits increase + AD expansion
- ▶ First: amplified aggregate demand? (inflation later)

Profits, Inequality, and AD

- ▶ simplest TANK (Bilbiie 2008): $\lambda \in (0, 1)$ H hand-to-mouth
- ▶ rest savers S ; All work for a union, sticky wages (Ascari et al, 2017)
- ▶ H may get some profits per-capita $\eta \in \left[0, \frac{1}{\lambda}\right]$, e.g. redistribution
- ▶ $\eta < 1$: profits skewed to S , own/price shares (natural assumption)
- ▶ Loglinearized model (SS with equal consumption):

$$c_t^H = (1 - \alpha) (w_t + n_t) + \eta d_t$$

$$c_t^S = E_t c_{t+1}^S - \sigma r_t$$

$$c_t = \lambda c_t^H + (1 - \lambda) c_t^S$$

Consumption Inequality: Sufficient Statistic

- ▶ Define consumption inequality $\gamma_t^C \equiv c_t^S - c_t^H$, rewrite

$$c_t^S = c_t + \lambda \gamma_t^C$$

- ▶ Aggregated Euler

$$c_t = E_t c_{t+1} - \lambda \left(\gamma_t^C - E_t \gamma_{t+1}^C \right) - \sigma r_t$$

- ▶ Amplification iff consumption inequality is countercyclical

$$\frac{\partial \gamma_t^C}{\partial c_t} < 0$$

Consumption Inequality: Sufficient Statistic

- ▶ Consumption inequality as a function of profits:

$$\gamma_t^C = \frac{1 - \eta}{1 - \lambda} d_t \rightarrow$$

$$c_t = E_t c_{t+1} - \lambda \frac{1 - \eta}{1 - \lambda} (d_t - E_t d_{t+1}) - \sigma r_t$$

- ▶ Amplification if either

1. profits countercyclical and go to S ($\eta < 1$) **or**
2. profits procyclical but go to H .

Consumption Amplification

- ▶ Solution:

$$c_t = \frac{1 - \lambda}{1 - \lambda (1 - (1 - \eta) \Omega)} \sigma E_t \sum_{j=0}^{\infty} (-r_{t+j}) - \frac{\lambda (1 - \eta)}{1 - \lambda (1 - (1 - \eta) \Omega)} \Theta d_{t-1}$$

- ▶ Key: interaction of profits' *distribution* and *cyclical* (wage vs price stickiness)

A Conundrum

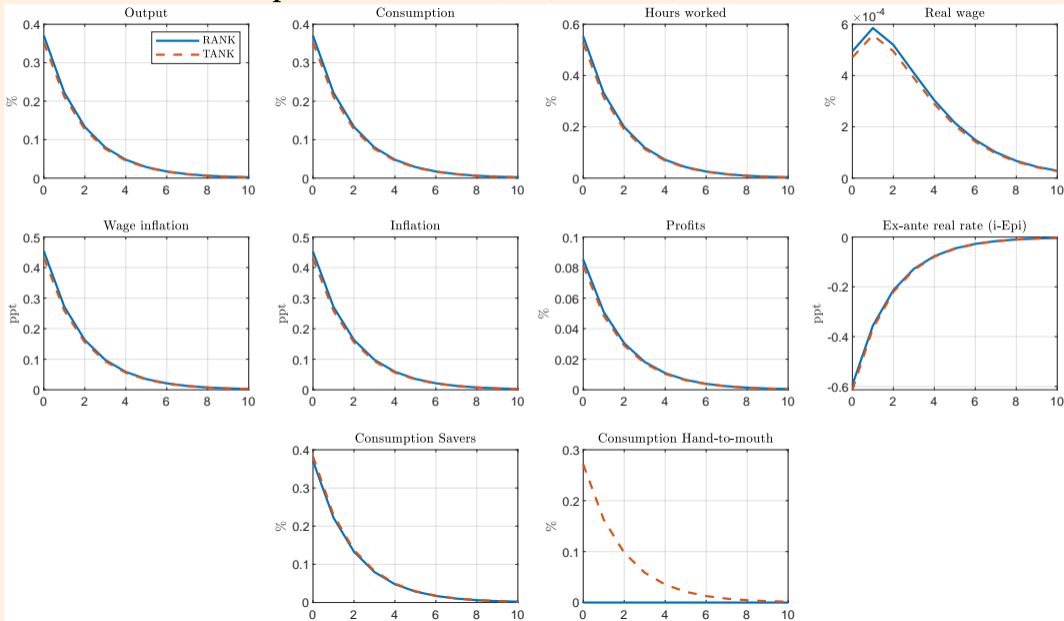
Profits	<i>Distribution</i> (skewed towards):	
<i>Cyclicality</i>	Asset-holders $\eta < 1$	Hand-to-mouth $\eta > 1$
Procyclical $\Omega > 0$	dampen	amplify
Counter- $\Omega < 0$	<u>amplify</u>	dampen

- ▶ Procyclical profits + concentrated stockholding (profits go to low-MPC) + amplification through heterogeneity

Understanding TA/HA Literature Findings

- ▶ Add sticky W to sticky P \rightarrow dampening;
 - ▶ Intuition: contains $w \uparrow, d$ less countercyclical (Ascari et al 2017; Bilbiie Kanzig Surico 2022)
- ▶ flex-P fixed-W $\Omega = \alpha > 0 \rightarrow$ dampening! (in benchmark $\eta < 1$)
 - ▶ akin to case in several papers by Auclert et al ($\alpha = 0 \rightarrow$ proportional incomes)
- ▶ NB: amplification in Broer et al from $\Omega > 0$ & $\eta > 1$
- ▶ Parameterized example; $\lambda = .27; i_t = \phi\pi_t + \varepsilon_t, \phi = 1.5$

AD amplification? TANK (dash) vs RANK (solid); 1% interest cut



Quantitative (Ir)relevance

- ▶ Calibrated example – almost neutral. Intuition: "aggregate MPC"
 - ▶ $\psi_w = .052 < \psi_p = 1.85$ (CEE): $1 - (1 - \eta) \Omega = 0.819 \rightarrow$ dampen by 0.937
- ▶ Small "victory": Procyclical profits \rightarrow inflationary demand shocks
- ▶ BUT: Silly model of profits (no role other than income transfer) + too large (determinant) role of profit redistribution

Profits as Investment Payoff

- ▶ Consumption inequality still sufficient statistic for AD amplification
- ▶ But inequality now has a richer set of determinants

$$\frac{C}{Y}c_t^H = (1 - \alpha)(w_t + n_t) + \eta d_t^A$$

$$\frac{C}{Y}c_t^S + \frac{1}{1 - \lambda} \frac{I}{Y}i_t = (1 - \alpha)(w_t + n_t) + \alpha \frac{1}{1 - \lambda} (r_t^K + k_t) + \frac{1 - \eta\lambda}{1 - \lambda} d_t^A$$

- ▶ Accounting profits(-ish), as in CEE:

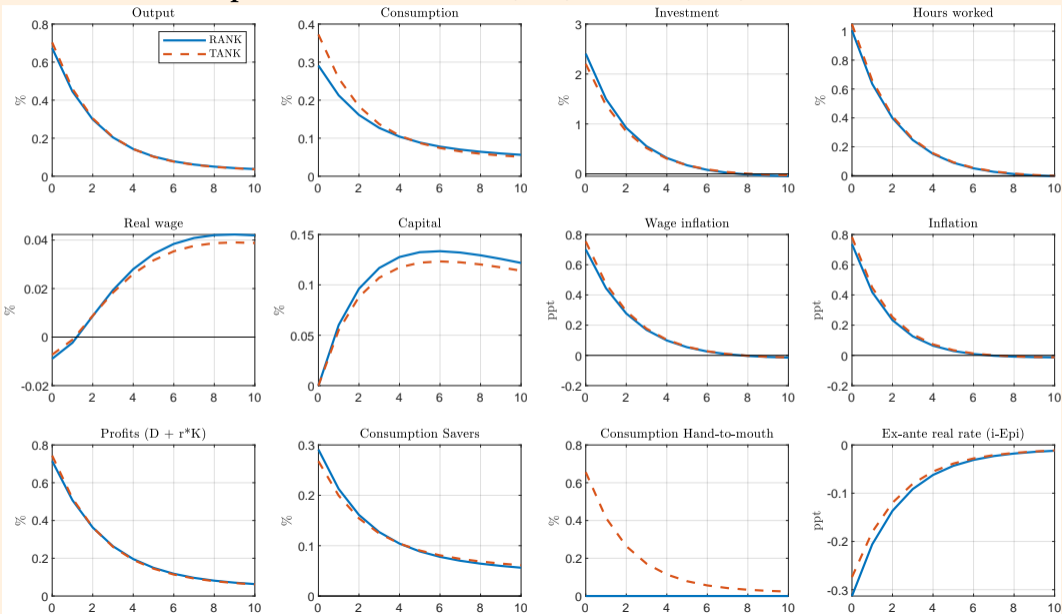
$$d_t^A = \alpha^{-1}d_t + (r_t^K + k_t)$$

- ▶ **Proposition:** C amplification if investment procyclical enough

$$\frac{\partial \gamma_t^C}{\partial c_t} < 0 \Leftrightarrow \frac{\partial i_t}{\partial c_t} > (1 - \eta) \left(1 + \frac{r}{\delta}\right) \frac{\partial d_t^A}{\partial c_t}$$

Generically satisfied even with *procyclical profits*

C amplification via I : TANK (dash) vs RANK (solid); 1% interest cut



And Inflation (and Greed)?

- ▶ No inflation amplification through AD and profits $\uparrow \rightarrow$ no "Greed"
- ▶ Recall

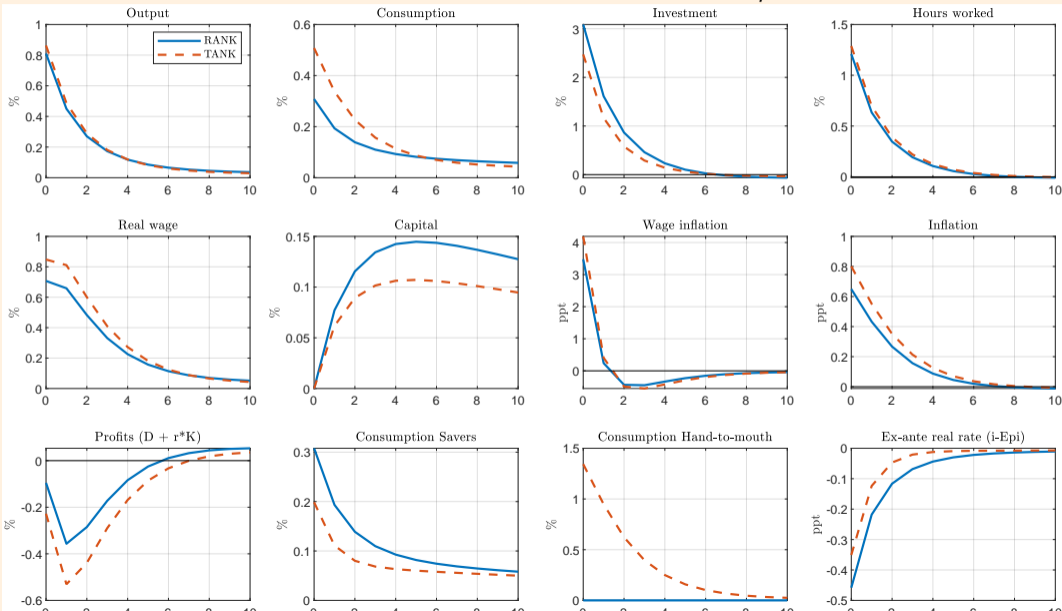
$$\pi_t = \psi_p \frac{\alpha}{1 - \alpha} c_t - \psi_p \frac{1}{1 - \alpha} d_t$$

- ▶ With capital:

$$\pi_t = \psi_p \frac{\alpha}{1 - \alpha} y_t - \psi_p \frac{\alpha}{1 - \alpha} d_t^A$$

- ▶ Sticky P: direct effect ψ_p less inflation; indirect effect more AD expansion \rightarrow more inflation
 - ▶ Related (but different): Hagedorn Mitman "Nominal demand" feedback AD-PC
- ▶ Can get π amplification through AD but requires *countercyclical* profits $\Omega < 0$

π amplification? TANK (dash) vs RANK (solid); 1% interest cut; $\psi_p = .05 < \psi_w = 1.05$



Greed? Profits, Inflation and AD All UP?

1. Procyclical & inflationary profits: analytical condition, sticky enough wages
2. Conundrum for HA models: procyclical profits going to asset owners → *dampening* through heterogeneity
3. Way out: Capital, cyclical enough investment → *AD* amplification with procyclical profits (profits' *redistribution* becomes a side show)
4. But: **no inflation** amplification, counteracting forces
 - ▶ →no "greed story" ≡ higher inflation & (*caused by?*) higher demand expansion & increasing profits