Keynesian Micromanagement

Mishel Ghassibe — *CREi, UPF & BSE*

Francesco Zanetti — *University of Oxford*

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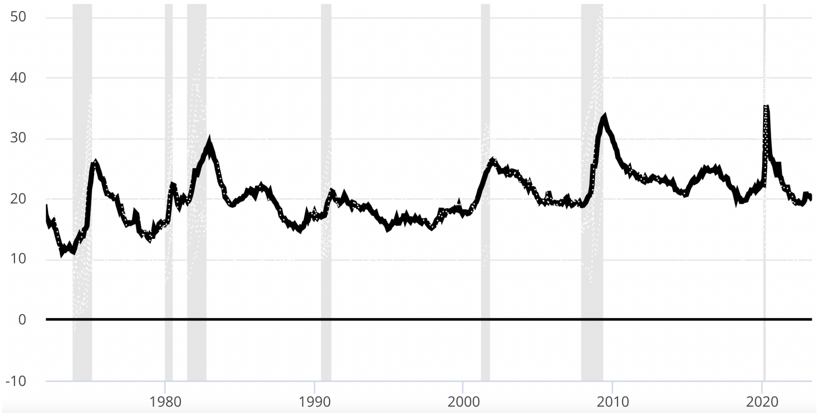
Spare Capacity (United States, %)



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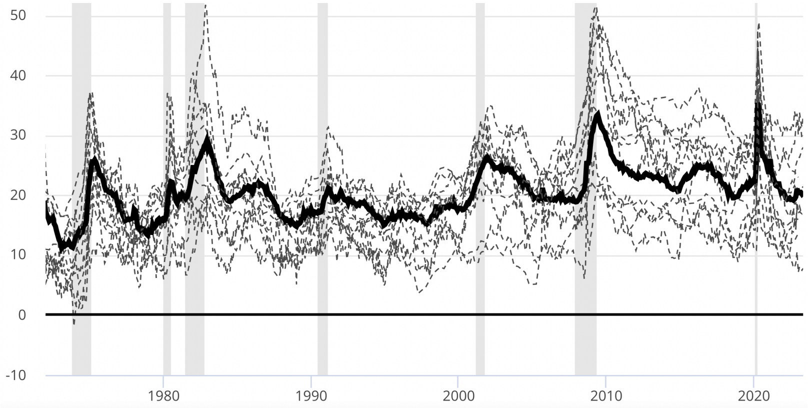

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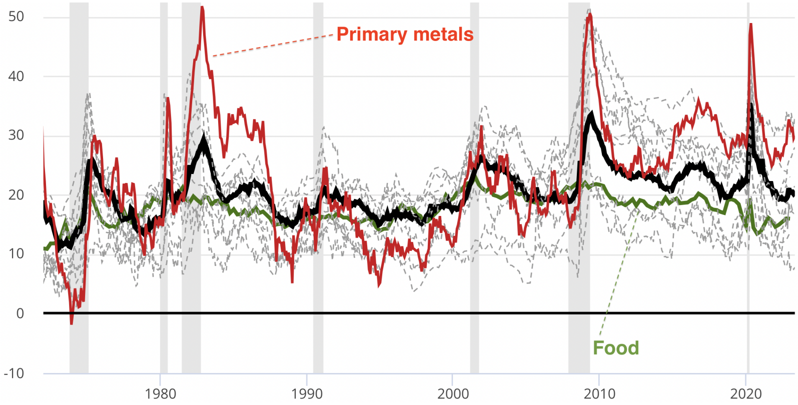

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Utilisation Effect *vs.* Congestion Effect

- Extra government spending on a sector can either increase or decrease endogenous sectoral productivity, depending on which of the two effects dominates

Optimal sector-specific government spending policy

- Consider a household who consumes N goods (cars, food, computers etc), and each good i can be either privately purchased (C_i) or provided by the government (G_i), amounting to utility:

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MULTI-SECTOR MODEL WITH SEARCH FOR GOODS

Multi-sector model with search: an overview

- *Agents*. firms subdivided into $N + 1$ sectors, indexed by $\{0, 1, ..., N\}$, households, fiscal authority

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- Each visit costs ρ_i of the sectoral good; hence consuming one unit requires purchasing:

$$1 + \gamma_i(x_i), \quad \gamma_i' > 0, \quad \forall i$$

units, where $1 + \gamma_i(x_i) \equiv q_i(x_i)/(q_i(x_i) - \rho_i)$ is the sectoral **congestion wedge**

Equilibrium

- *Firms.* Perfectly competitive, hire labor L_i and intermediate inputs $\{Z_{ij}\}_{j=0}^{N}$ to obtain capacity K_i:

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- Close the model with labor market clearing, as well as in clearing the goods market:

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- A pricing rule to pin down movements in tightness: $\quad P_i = \mathcal{P}_i(MC_i), \quad \mathcal{P}_i' \geq 0, \quad \mathcal{P}_i'' \leq 0, \quad \forall i$

OPTIMAL FISCAL POLICY

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- Indirect effect: government spending in any sector k (G_k), in general, affects private consumption in any other sector i (C_i):

$$\frac{\partial C_i(\mathbb{G})}{\partial G_k} = \overbrace{A_i'(x_i)\frac{\partial x_i(\mathbb{G})}{\partial G_k}K_i + A_i(x_i)\frac{\partial K_i(\mathbb{G})}{\partial G_k}}^{\text{Supply-side effect}} - \overbrace{\frac{\partial G_i}{\partial G_k} - \sum_{j=1}^{K}\frac{\partial Z_{ji}(\mathbb{G})}{\partial G_k}}^{\text{Demand-side effect}}$$

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- If private and public versions of the same good are perfect substitutes $\Longrightarrow$ optimal policy targets $x_i = x_i^*, \forall i$ (maximise *TFP*)

Optimal Fiscal Policy:

An Approximation near Constrained Efficiency

$$\left(\{S_i^*\}_{i=0}^N, \;\; \left\{(G_i/C_i)^*\right\}_{i=1}^N\right)$$

Functional Forms

- Assume CES aggregators for final demands:

$$D^i(C_i, G_i) = \left[(1-\delta_i)^{\frac{1}{\epsilon_i}} C_i^{\frac{\epsilon_i - 1}{\epsilon_i}} + \delta_i^{\frac{1}{\epsilon_i}} G_i^{\frac{\epsilon_i - 1}{\epsilon_i}}\right]^{\frac{\epsilon_i}{\epsilon_i - 1}}, \quad \forall i$$

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- Assume CES aggregators for final demands:

$$D^i(C_i, G_i) = \left[(1-\delta_i)^{\frac{1}{\epsilon_i}} C_i^{\frac{\epsilon_i - 1}{\epsilon_i}} + \delta_i^{\frac{1}{\epsilon_i}} G_i^{\frac{\epsilon_i - 1}{\epsilon_i}} \right]^{\frac{\epsilon_i}{\epsilon_i - 1}}, \quad \forall i$$

- Assume the following utility function:

$$\mathcal{U} = \sum_{i=1}^{N} \frac{[D^i(C_i, G_i)]^{1-\sigma} - 1}{1-\sigma}$$

where $\sigma > 0$

- Assume a Cobb-Douglas matching function:

$$h^i(K_i, V_i) = K_i^{\eta_i} V_i^{1-\eta_i}, \quad \forall i$$

- Assume constant pass-through of marginal costs to prices:

$$\mathcal{P}_i(MC_i) = MC_i^{1-r_i}, \quad \forall i$$

Optimal Fiscal Policy: an Approximation

Proposition (Optimal policy near constrained efficiency)

Near constrained efficiency, optimal deviations of sectoral government consumptions and spare capacities satisfy:

$$\hat{gc}_i = \frac{\zeta_i}{1-\delta_i} \times \underbrace{\left[\sum_{t=0}^{N} \lambda_t^* \frac{r_t}{1-\eta_t} \hat{s}_t\right]}_{\text{Common component}}, \qquad i = 1, \ldots, N$$

where

$$\zeta_i \equiv \frac{\left(\frac{\delta_i}{1-\delta_i}\frac{1}{\epsilon_i} + \sigma\right)^{-1}}{\sum_{j=1}^{N} \omega_j^{CG} \left(\frac{\delta_j}{1-\delta_j}\frac{1}{\epsilon_j} + \sigma\right)^{-1}}$$

and $\quad \hat{gc}_i \equiv \left[\log(G_i/C_i) - \log(G_i/C_i)^*\right], \quad \hat{s}_t \equiv (S_t - S_t^*)/(1-S_t^*).$

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- Sectoral component: dependence on the elasticity of substitution between private and public provision (ϵ_i)
- Common component: larger weight on spare capacity of sectors that are: (i) larger (λ_t); (ii) have lower price-cost pass-through (r_t); (iii) lower elasticity of spare capacity to tightness (η_t)

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Conclusion

- Develop a novel multi-sector model with search frictions in goods markets
- Study optimal sector-specific fiscal policy to address involuntary spare capacity across sectors
- Theoretical results provide a tractable generalisation of the classic Samuelson principle
- A highly generalisable setting: fluctuations away from efficiency, alternative government funding schemes, segmented labor markets

APPENDIX