

Macro II

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Five steps according to Kydland and Prescott

- 1 Pose a question or aim, e.g.,
 - account for certain facts in the data.
 - find implications of policy change, welfare costs of business cycles, etc.
- 2 Use “well-tested theory” to address the question.
- 3 Construct the model: feasibility and simplicity versus relevance.
- 4 Calibrate the model parameters in ways that are not directly related to the question. (Statistical test are not very helpful, all models are false.)
- 5 Put on lab coat and run the experiment.

Calibration and comparing to data

- Calibrate β to match interest rate, α and δ to match labor share and investment ratio.

Use a range of values for preference parameters (intertemporal and labor supply elasticities) or calibrate based on micro studies. Do not use model to estimate these!

- Calibrate technology shock process to match Solow residual.
- Solow growth accounting in terms of log-deviations from steady state:

$$\hat{Y}_t = \hat{Z}_t + \alpha \hat{K} + (1 - \alpha) \hat{L}$$

- Then fit an AR(1) process $\hat{Z}_{t+1} = \rho \hat{Z}_t + \varepsilon_{t+1}$
usually gives $\rho = 0.95$

- What is the Solow residual, really? Not only shocks to technology.
 - Measuring quality improvements.
 - Utilization of capital.
 - Measuring effort, human capital.
 - Labor hoarding.
- *Critical comments:*
 - Negative shocks hard to swallow.
 - Shocks are meaningful on industry or firm level, but not necessarily in the aggregate.
 - They serve as a representation of something else, *measure of ignorance?*
- But in the end it may make sense with some aggregate movements in technology. Do we need to know exactly what is is?

TABLE 6.4
Moment comparison

<i>H-P filtered Data</i>						
<i>j</i>	σ_j	$\frac{\sigma_j}{\sigma_y}$	$\varphi(1)$	$\varphi_{j,y}(0)$	$\varphi_{j,y}(1)$	
<i>y</i>	0.0177	1.00	0.86	1.00	0.86	
<i>c</i>	0.0081	0.46	0.83	0.82	0.75	
<i>i</i>	0.0748	4.23	0.79	0.95	0.80	
<i>n</i>	0.0185	1.05	0.90	0.83	0.62	
<i>RBC Model</i>						
	σ_j	$\frac{\sigma_j}{\sigma_y}$	$\varphi(1)$	$\varphi_{j,y}(0)$	$\varphi_{j,y}(1)$	
<i>y</i>	0.0207	1.00	0.87	1.00	0.87	
<i>c</i>	0.0101	0.48	0.94	0.96	0.93	
<i>i</i>	0.0752	3.63	0.81	0.98	0.79	
<i>n</i>	0.0076	0.366	0.78	0.97	0.76	

Notes: $\varphi(1)$ denotes first-order serial correlation; $\varphi_{j,y}(l)$ denotes l^{th} order correlation between variables j and y . Model moments based on the parameterization

$$\mu = [\alpha \ \beta \ \phi \ \varphi \ \delta \ \rho \ \sigma]' = [0.24 \ 0.99 \ 1.5 \ 0.35 \ 0.025 \ 0.78 \ 0.0067]'$$

Notes: Taken from DeJong and Dave

- Volatility and comovement of consumption and investment with output are well accounted for.
- But in the data, wages are not very volatile and
- the empirical correlation between hours and labor productivity is small.
- The RBC model predicts a high correlation between hours worked and labor productivity (=wages), since labor moves only because the marginal product of labor fluctuates.
- Need theory for real wage rigidity.
- Economic mechanisms play only a small role in propagating shocks (behavior of output similar to that of shock Z).

Wedge accounting – RBC as benchmark

- Chari, Kehoe and McGrattan (2007). Idea: account for which margins in RBC-model are responsible for deviation between model and reality. Induction. Brinca (2013).
- "Something" prevents optimality conditions from being satisfied exactly
- For example; assume

$$U(C_t, L_t) = \ln C_t + \frac{\varepsilon}{\varepsilon - 1} \phi L_t^{\frac{\varepsilon-1}{\varepsilon}}$$
$$C_t \phi L_t^{\frac{-1}{\varepsilon}} = w_t$$

- Then define

$$\tau_{lt} = 1 - \frac{C_t \phi L_t^{\frac{-1}{\varepsilon}}}{w_t}$$

Variations in τ_{lt} could be driven by variations in ϕ , or something else.

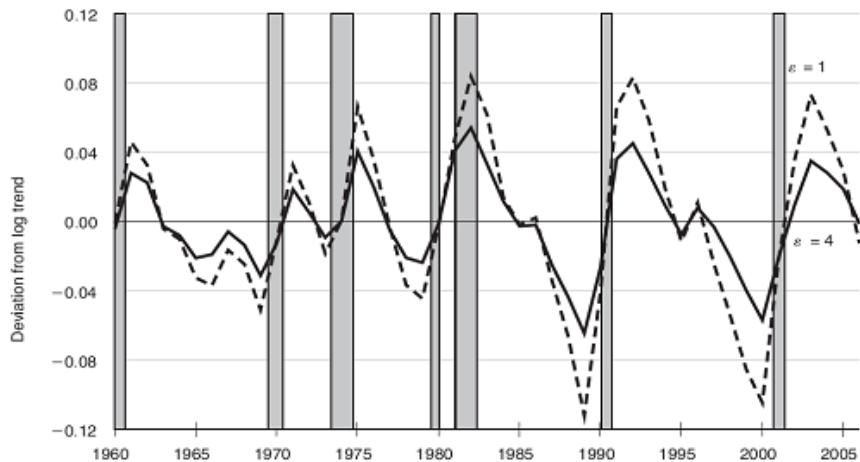
- Similar wedge can be constructed for intertemporal wedge.

Wedge accounting results

- Productivity shock Z_t and labor wedge τ_{lt} drive most of the cyclical variation. Other wedges (investment wedge) is not very important for the cyclical variation.
- Labor Wedge



Cyclical component of labor wedge



What is the of labor wedge

- Countercyclical labor tax rates
- Preference or markup shocks
- Heterogeneity.
- Intensive and extensive margin
- Labor market frictions, hoarding, search.
- Price and wage stickiness.