

# MPhil Macroeconomics - Monetary Economics

Informal course overview for our macro classes in HT & TT 2021

*Note: Informal and highly stylized, includes topics not covered in the lectures and leaves out others.*

*Refer to Andrea's syllabus, lectures and problem sets for the exam-relevant content.*

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## WEEK 1: THE REAL EFFECTS OF MONEY

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### **RBC models w/ money** [■ CLASSICAL MONETARY MODEL]

[■ MIU MODEL → LR: super-neutrality (+ Friedman rule); SR dynamics (log-linearization, fixed capital): neutrality (aside: break non-neutrality (but effect small) w/  $u_{mc} \neq 0$ ; CB policy w/  $M$  or  $i$  ( $P$  undetermined;  $i$  constant →  $\pi_t$  also indeterminate; need feedback rule + Taylor principle]

PS6, Q1\* (CIA) [■ SHOPPING TIME MODELS → (i) transaction technology, (ii) cash-in-advance (CIA) → w/  $u_{lm} \neq 0$ , effect on  $c$  if  $u_{cl} \neq 0$ ]

PS6, Q2 (VAR w/ LR restrictions) **Empirical evidence on role of money** [LR neutrality; SR non-neutrality; identification: (i) dynamic correlations, (ii) event studies, (iii) VARs w/ short-run restrictions]

## WEEK 2: THE NEW NEOCLASSICAL SYNTHESIS

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### **New-Keynesian model** (imperfect competition + nominal rigidities)

PS6, Q3 (Rotemberg adj cost) & PS6, Q4\* (IRFs) [Wholesale producers (differentiated goods, monopolistic competition,  $P_t > MC_t$ ) → retailers (perfect competition) → HHs; choices: (i) wholesalers: production ( $Y_t(i) = A_t N_t(i)$ ) + price setting ( $P_t(i)$ ), (ii) retailers: aggregation (CES;  $Y_t(i) \rightarrow Y_t$ ), (iii) HH: consumption ( $C_t$  vs  $N_t$ ); price rigidities (Calvo, Rotemberg ...) → dynamic price setting problem (dispersion w/ Calvo); log-linearization & flexible-price benchmark to compute output gap → 3-equation model: IS, NKPC, TR; IRFs for 3 shocks]

## WEEK 3: THE 3-EQUATION NK MODEL

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PS7, Q2\* (Interest rate peg) & PS7, Q4 (Alt det criteria) **Equilibrium properties of the 3-equation NK model** [w/o capital/ other endogenous states purely forward-looking; eq determinacy via Blanchard and Kahn, 1980 → #controls = # $\lambda < 1$ ; for 2x2 system: Bullard and Mitra, 2002; generalized Taylor principle; weak mp/ int rate peg → role for non-fundamental/ sunspot shocks]

**Volcker disinflation & Great Moderation** [Clarida, Galí, and Gertler, 2000: illustration of indeterminacy problem (good/ bad policy); aside: alternative explanations → e.g. Orphanides, 2002 (measurement); good shocks, bad shocks hypothesis ...]

## WEEK 4: OPTIMAL MONETARY POLICY

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**Welfare objective** [linear-quadratic (LQ) approach (tractable); 2nd order approximation of  $\mathbb{W}_0$  → quadratic in output gap and inflation]

**Solution under commitment** [CB can credibly influence expectations; only constraint: PC; perfect stabilization  $\forall$  shocks other than cp → opt price level/ output gap trade-off; time 0/ time inconsistency problem → Woodford, 1999 timeless perspective; in practice: FED's average infl targeting; aside: no stabilization bias; no inflation bias]

PS7, Q1\* (Inflation bias) & PS7, Q3 (Inflation nutter) **Solution under discretion** [CB takes expectations as given; only constraint: PC; time-consistent solution; optimal trade-off in inflation/ output gap; opt int rate setting tracks efficient real int rate and responds to  $\pi_t$  (TR principle satisfied); inflation bias]

## WEEK 5: THE LOWER BOUND ON NOMINAL INTEREST RATES

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	<b>Motivation</b> [The effective lower bound & negative rate policies]
	<b>Demand-driven recessions</b> [financial crises as demand shocks ( $r_t^* \downarrow$ ); think discount factor shocks instead of prod shocks where ff not explicitly modelled; aside: $c_t/i_t$ co-movement problem w/ discount factor shocks, Smets and Wouters (2007) introduce risk premium shocks; full stabilization w/o ZLB]
PS8, Q1* (Contractionary New Deal)	<b>Demand shocks and the ZLB</b> [non-linearity in the mp rule; solve w/ 2-state Markov process for $r^*$ as in Eggertsson and Woodford (2003) → analytical solution (alt: occbin toolbox; regime-switching; global methods); upward-sloping AS/AD system; $\{x_t, \pi_t\} < 0$ & $\downarrow$ as $\mu \uparrow$ ; expectations key; appl: <u>Great Depression &amp; Great Recession</u> ]
PS8, Q2 (Inf target)	<b>Optimal policy at the ZLB</b> [AD binding constraint; opt commitment policy history-dependent ( $T_1 \leq T_2$ ); forward guidance vs systematic rule (avg $\pi$ targeting); <u>raising <math>\pi^*</math></u> ]

## WEEK 6: LABOR MARKET FRICTIONS

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PS8, Q3* (Nominal wage rigidity)	<b>NK model w/ sticky wages</b> [empirical evidence for sluggish wage adjustment; simple model w/ monopolistic labor supply by hhs & sticky wages (alt: add labor unions) → Wage Phillips Curve & eq unemployment; Galí (2011): in data, $\text{corr}(u_t, \pi_t^w) < 0$ ] <b>Optimal policy w/ sticky wages</b> [wage dispersion in hh utility → $\pi_t^w$ in welfare fct; op stabilizes both $\pi_t$ and $\pi_t^w$ ; degree of price/ wage stickiness key]
PS8, Q4 (S&M and Beveridge Curve)	<b>Search &amp; matching</b> [intuition: UE arises because of <u>search frictions</u> ; introduce in NK model → 'Shimer puzzle': employment too persistent, wages too volatile; solve via sticky wages, hiring cost, alternating-offer bargaining ... (anything that reduces the fundamental surplus overview as discussed in Ljungqvist and Sargent (2017))]

## WEEK 7: FISCAL POLICY

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	<b>Debt sustainability</b> [govt budget constraint w/ Ricardian equivalence; simple log-linear approximation → tax rule $\hat{\tau}_t(b_{t-1})$ ensures debt sustainability (c.p.)]
PS9, Q1* (Govt exp in a NK model)	<b>Fiscal dominance</b> [3-eq NK model w/ mp & fp → 2 states $\{\pi_{t-1}, b_{t-1}\}$ ; Leeper (1991), det: active/passive (separation principle) & passive/active mp / fp (fiscal dominance)]
PS9, Q2 (FTPL) & PS9, Q3 (Flex infl targeting & det)	<b>Optimal fiscal policy</b> [fp only via endog sales tax (cp shock): debt sust vs supply dist; Benigno and Woodford (2003), op st PC & govt BC: (i) flex prices → fiscal dominance; (ii) sticky prices → permanent change/ unit root in real vars (taxes, debt, output)] <b>FP at the ZLB</b> [ignore debt sust (lump-sum T); normal times: $g_t$ w/ ad & $\hat{\tau}_t$ w/ cp prop; switches at ZLB → $g_t \uparrow$ exp, $\hat{\tau}_t \downarrow$ contract; Eggertsson (2011): cons tax $\downarrow$ exp]

## WEEK 8: THE FORWARD GUIDANCE PUZZLE

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	<b>The puzzle</b> [Del Negro et al (2012), exaggerated model response to fg → $i_{t+j}$ w/ direct effect on $x_t$ ; resolution: add discounting (olg; het + incomplete markets; myopia)]
	<b>Complete markets</b> [availability + trade in complete set of state-contingent securities → perfect consumption insurance/ aggr under heterogeneity/ repr agent]
	<b>Empirical evidence</b> [market incompleteness via liquidity constraints (vs PIH) → 20-30% of hhs hand-to-mouth (h-t-m); 2/3 of these wealthy h-t-m (Kaplan et al, 2014)]
PS9, Q4* (Hand-to-mouth agents)	<b>Simple model w/ h-t-m hhs</b> [ <u>two-agent setup w/ &amp; w/o fin market participation</u> ; transition probab + with-in group cons insurance; focus on zero-eq-liquidity: wealthy h-t-m & imperfect insurance → prec savings + add discounting ✓ (Bilbiie, 2019)]