Final State Exam: IES FSV UK

Class	Macroeconomics A
Code	JEM004
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Notes	

1. Solow growth model: Assumptions and Inada conditions. Dynamics of capital in continuous time. Phase diagram. The golden rule of capital. Qualitative effects of a change in the saving rate on k, y, c, $\dot{y}$ (output per head). Quantitative effects of a change in the saving rate. Growth accounting. Implications of the model for the central questions of the growth theory.

Hint:

$$\dot{k} = sf(k(t)) - (n+g+\delta)k(t)$$

$$k(t) - k^* \simeq e^{-[1-\alpha_k(k^*)](n+g+\delta)t}[k(0) - k^*]$$

$$\frac{s}{y^*}\frac{\partial y^*}{\partial s} = \frac{\alpha_k(k^*)}{1-\alpha_k(k^*)}$$

$$\frac{\partial c^*}{\partial s} = [f'(k) - (n+g+\delta)]\frac{\partial k}{\partial s}$$

$$\frac{\dot{Y}_t}{Y_t} = \alpha_K \frac{\dot{K}_t}{K_t} + \alpha_L \frac{\dot{L}_t}{L_t} + R_t$$

2. Ramsey-Cass-Koopmans model: Assumptions. Behaviour of households: utility function and budget constraint at time *t*, no Ponzi-game restriction. Behavior of firms. Optimization problem and Hamiltonian.

3. Ramsey-Cass-Koopmans model II: Dynamics of the economy and phase diagram. Qualitative and quantitative effects of a changes in the discount rate. Welfare questions. Government expenditures in the model. Barro-Ricardian equivalence.

Hint to questions 2 and 3:

$$U = \int_0^\infty u[c(t)]e^{nt}e^{-\rho t}dt$$

$$\frac{c - c^*}{k - k^*} = \frac{f''(k^*)c^*}{\theta}\frac{1}{\mu}$$

$$\frac{\dot{c}(t)}{c(t)} = \frac{f'(k(t)) - \rho - \delta - \theta g}{\theta}$$

$$\dot{k}(t) = f(k(t)) - c(t) - (n+g+\delta)k(t)$$

4. Models of endogenous growth: Motivation and assumptions. AK models and R&D models – main differences and examples. Production function in AK model. Transitional dynamics of AK model. Are the constant returns on capital plausible? Model with human capital as AK model.

$$\frac{\dot{k}}{k} = \frac{1}{\theta}(A - \delta - \rho)$$

$$k(t) = \frac{c(t)}{\varphi}$$

$$R_H - \delta_H = R_K - \delta_K$$

$$f(H/K) \equiv A$$

5. Economic Growth and Empirics I: Cross-country growth regression Stylized facts about economic growth: distribution of income and its evolution over time. Testing of the Solow model: derivation of the cross-country growth regression. Extension for the human capital. Conditional vs. unconditional convergence.

6. Economic Growth and Empirics II: Issues in identifying growth determinants. Omitted variable bias and investigation of economic growth. Examples of panel data techniques. Principal components. What are the main determinants of economic growth identified in the literature? Provide some examples and intuition, why these determinants have impact on economic growth.

7. Real business cycle model: Competing theories of fluctuations. What causes cyclical fluctuations in neoclassical models? Assumptions of the basic RBC model. Behaviour of households under certainty and uncertainty. Solution of the model with perfect depreciation and without public sector. Solving the model in the general case. Calibration vs. estimation of parameters. Extensions and limitations.

Hint:

$$u_t = \ln c_t + b \ln(1 - l_t)$$

$$\frac{c_t}{1 - l_t} = \frac{w_t}{b}$$

$$\ln A_t = \bar{A} + gt + \rho_A \widetilde{A}_{t-1} + \varepsilon_{A,t}$$

$$\widetilde{Y}_t = (\alpha + \rho_A)\widetilde{Y}_{t-1} - \alpha\rho_A\widetilde{Y}_{t-2} + (1 - \alpha)\varepsilon_{A,t}$$

$$\frac{1}{c_t} = e^{-\rho}E_t\left[\frac{1}{c_{t+1}}(1 + r_{t+1})\right]$$

8. Empirical investigation of business cycles: Recession vs. growth recession. Approaches to trend/cycle decomposition. The Hodrick-Prescott filter and the role of parameter lambda. Stylized facts of business cycles: relative volatility and phase shift of consumption, investment, employment, government expenditures, money supply and price level. Great Moderation.

Hint:

$$\min\left(\sum_{t=1}^{T}(y_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1}\left[(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})\right]^2\right)$$

9. Inflation and Monetary Policy: Types of inflation. Dynamic inconsistency of low-inflation monetary policy. Model of reputation and delegation. Stabilization policy and problems with its realization. Rules versus discretions. The Taylor rule

Hint:

$$\min_{\pi} \frac{1}{2}[\bar{y} + b(\pi - \pi^e) - y^*]^2 + \frac{1}{2}a(\pi - \pi^*)^2$$

$$\pi = \pi^* + \frac{b}{a + b^2}(y^* - \bar{y}) + \frac{b^2}{a + b^2}(\pi^e - \pi^*)$$

10. Unemployment: Efficiency wages models, contractual models and search and matching models: Summary and comparison of implications of such models. Shapiro-Stiglitz model. Hypothesis of hysteresis. Mortensen-Pisarides model. Beveridge curve.

Hint:

$$w = \bar{e} + \left(\rho + \frac{\bar{L}}{\bar{L} - NL} b \right) \frac{\bar{e}}{q} \qquad\qquad KU^{\beta} V^{\gamma} = bE$$

11. Phillips curve and the Output-inflation trade-off: Phillips curve – theoretical vs. empirical perspective. Expectations augmented Phillips curve. Estimation of Phillips curve and NAIRU. NAIRU and equilibrium rate of unemployment. Beveridge curve.

12. Traditional Keynesian theories of fluctuations: Aggregate demand in closed and open economy. Fixed prices and IS-LM model. Fiscal and monetary policy in IS-LM model. Alternative assumptions about wage and price rigidities.

Hint:

$$\ln Y_t = \ln Y_{t-1} - \frac{1}{\theta} r_t \qquad\qquad \frac{M_t}{P_t} = Y^{\frac{\theta}{v}} \frac{1 + i_t}{i_t}^{\frac{1}{v}}$$

13. Imperfect price adjustment. Why do nominal wages and prices adjust sluggishly? Lucas imperfect information model. New Keynesian Economics and small frictions – are they enough to explain GDP fluctuations? Real Rigidities.

Hint:

$$y = b(p - E(p)) \qquad\qquad p_i^* - p = \ln \frac{\eta}{\eta - 1} + (\gamma - 1)y = c + \phi y$$

14. VAR models. Empirical investigation of the effects of economic policy. Definition of VAR model. Estimation of VAR model and Choleski identification. VAR model and monetary policy. Impulse response functions. Does monetary policy have real effects?

15. Dynamic Stochastic General-Equilibrium Models of Fluctuations: RBC's vs. DSGE models. Staggered price adjustment (Taylor model, Calvo model). New Keynesian Phillips Curve and inflation inertia. Canonical 3 equation NK model and possible extensions. Effects of monetary policy in 3 equation NK-DSGE model.

Hint:

$$y_t = E_t[y_{t+1}] - \frac{1}{\theta} r_t + u_t^{IS}$$
$$\pi_t = \beta E_t[\pi_{t+1}] + \kappa y_t + u_t^{\pi}$$
$$r_t = \phi_{\pi} E_t[\pi_{t+1}] + \phi_y E_t[y_{t+1}] + u_t^{MP}$$