



National Research University Higher School of Economics
Syllabus of the course Advanced Macroeconomics (Macroeconomics-3)
Program 080100.68 'Economics', Master's programs in 'Economics: Research Program',
'Applied Economics' and 'Statistical Analysis of Economic and Social Processes'

The Government of the Russian Federation

The Federal State Autonomous Institution of Higher Education
'National Research University Higher School of Economics'

Faculty of Economics

Course Title: **Introduction to Advanced Macroeconomics**

Program 080100.68 'Economics'
Master's programmes in 'Economics: Research Program',
'Applied Economics' and 'Statistical Analysis of Economic and Social Processes'

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I. Course design

I.1 Course description

This introductory course to Advanced Macroeconomics along with Econometrics and Advanced Microeconomics forms the core trinity of compulsory disciplines that provide a theoretical background for the master's program in economics at the HSE Faculty of Economics. The one-semester course is taught in English in the 1st and 2nd modules to the first-year graduate students.

The course focuses on selected topics which are central to modern macroeconomics, like the short-run economic fluctuations, stabilization policies in the medium-run, long-run economic growth, as well as political economy issues of macroeconomic policies. Both basic and more advanced theoretical models and analytical techniques are widely used in the course but are treated as tools for granting insights into important issues, not as ends in themselves. Yet, this requires from students certain facility with linear algebra and some basic game theory. The course also assumes students' familiarity with introductory macroeconomics topics but this is not compulsory.

I.2 Scope of application and reference to regulatory documents

This document establishes the minimum requirements for knowledge, skills and competences of the student, determines the coverage and content of the course, indicates teaching methods and forms of learning activities as well as assessment criteria and grade determination.

The course syllabus is designed for the instructors, teaching assistants and students of the Education Program 080100.68 'Economics' following Master's programs in 'Economics: research program', 'Applied Economics' and 'Statistical Analysis of Economic and Social Processes'.

This syllabus has been developed in accordance with:

- National curriculum standard FGROS-3
- Education Program 080100.68
- University Academic Plan of the Education Program 080200.68 (approved in 2011).

I.3 Course objectives

The course aims to:

- introduce students to widely used macroeconomic theories and their applications,
- ensure students can apply macroeconomic analysis using both graphical and algebraic techniques to the study of contemporary and historical economic cases,
- develop students' ability to put their research and professional interests into a broader political and macroeconomic context,
- encourage students to question and critically assess existing academic and non-academic literature in their research area from the macroeconomic perspective,
- enable students to communicate their ideas using modern internationally recognised professional language of economists.

I.4 Intended learning outcomes

On completion of the course student will be able to:

- ILO 1. Identify and formulate basic macroeconomics work horse models and explain their limits of applicability,
- ILO 2. Evaluate work horse models to solve given problems,
- ILO 3. Differentiate between modelling devices and main implications of the work horse models,
- ILO 4. Justify empirical relevance of these models and political feasibility of recommendations derived from them,
- ILO 5. Explain and justify positive and normative macroeconomic policy propositions with integration of the appropriate literature, both in written and oral communications,
- ILO 6. Deliver solutions to macroeconomic policy problems through applying good group working practices.

I.5 Student's competences after the course

The following abbreviations (NC/NRU-HSE Codes as per Educational Standard of the National Research University Higher School of Economics) are used in the Table 1:

GSC – general scientific competence, IC – instrumental competence, SPC – social, personal and cultural competence, PC – professional competence

Table 1 below provides the logical links between student's competencies developed in the course, measurable intended learning outcomes and corresponding education methods.

I.6 Place of the course in the structure of the educational program

The course design aims at dealing with extensive students' diversity in terms of both their initial backgrounds and future career tracks. In particular, highly interactive teaching methods and constructively aligned assessment criteria enable students to choose individual educational trajectories and guarantee accommodative jump to a certain established level of competencies of professional economist irrespective their prior familiarity with macroeconomics.

With the aim to introduce students to modern (and very often complicated) macroeconomic theories and their applications as well as develop their abilities to critically assess academic and journal articles the course is based on a number of 'work horse' models that require the use of both graphical and algebraic techniques. Thus mastering problem solving skills has become an immanent learning activity on the course at this level. However, the course is far from being based exclusively on problem solving as compared to its counterpart course primarily for macroeconomists in the Spring semester (with closed-book time-pressured written exam as the main assessment tool). Rather it provides students with various backgrounds and interests with the chance to become interested in macroeconomics and be well prepared for the more advanced course in module 3 and 4.

At the same time the coverage and content of the course correspond to what is internationally recognized as Intermediate Macroeconomics.

Table 1. Design of the course to develop student's competencies

Aims The course aims to:	Measurable ILOs	NC/NRU-HSE Code	Assessment for Learning		Teaching Strategy	Learning Activity
			Formative	Summative		
1. introduce students to widely used macroeconomic theories and their applications,	ILO 1. Identify and formulate basic macroeconomics work horse models and explain their limits of applicability	GSC-1, SPC-14,	Q&A		Lecture (slots 1 and 2)	Attending, memorizing
			Quiz (peer-marked)	Quiz	Seminars (clarification) Guidance for reading,	Apprehending, reproducing linking to theory
2. ensure students can apply macroeconomic analysis using both graphical and algebraic techniques to the study of contemporary and historical economic cases, 3. encourage students to question and critically assess existing academic and non-academic literature in their research area from the macroeconomic perspective,	ILO 2. Evaluate work horse models to solve given problems	GSC-1, SPC-1, SPC-14,	Q&A (written answers),		Lecture (slots 2 and 3) Seminars (problem solving) Set problems for HA Prepare Marking Schemes for HA	Transforming knowledge
			HA (part I)	Mid-term test (I) Final exam (I)		
	ILO 3. Differentiate between modelling devices and main implications of the work horse models	SPC-1, SPC-4, SPC-14, PC-4, PC-5, PC-8, PC-9, PC-10	Q&A		Lecture (slot 3)	Transforming knowledge
			HA (part I)	Mid-term test (I) Final exam (I) GRP Essay	Seminars (problem solving and discussion of research articles)	Challenging conceptions Discriminating clarifying internal relations,
				Set problems for HA and Marking Schemes for HA	Relating experience to models	
4. develop students' ability to put their research and professional interests into a broader political and macroeconomic context,	ILO 4. Justify empirical relevance of the work horse models and political feasibility of recommendations derived from them	IC-1, IC-4, SPC-14, PC-1, PC-2, PC4-5, PC8-10	Q&A		Lecture (slots 4) Seminars (discussion/debates) Preparing lecture notes and HA marking schemes	Investigating, reflecting on experience Relating experience to theory and theory to practice
			HA (part II)	Mid-term test (II) Final exam (II) GRP Essay		
5. enable students to communicate their ideas using modern internationally recognised professional language of economists.	ILO 5. Explain and justify positive and normative macroeconomic policy propositions with integration of the appropriate literature, both in written and oral communications	IC-1, IC-2, SPC-6, SPC-13, SPC-14, PC-1, PC-2, PC-4, PC-5, PC-8, PC-9, PC-10, PC-11, PC-12	Q&A		Affordance for discussions/debates in tutorials (, problem solving	Relating theory to practice, Synthesising
			HA (part II) Mock Group Presentation	GRP Presentation		
			Essay (list of references)	Essay	Office hours (goal-action-feedback cycle)	Self-directed learning Synthesising
	ILO 6. Deliver solutions to research problems through applying good group working practices	IC-3, SPC-7, SPC-8, SPC-13, SPC-14, PC-11, PC-12	Mock Group Presentation	GRP Presentation	Moderating debates and interactive	Articulating, reflecting on experience, relating theory to practice

II. Course schedule

The course an Introductino to Advanced Macroeconomics is anchored by the material covered in the textbook by

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. (Upper Saddle River, NJ: Prentice Hall, 2012) Sixth edition [ISBN 9780273766339]

which is an essential reading. However, most of the data and case studies in Blanchard’s *Macroeconomics* come from the US. Still this book provides a good example of internationally recognised standard one-year *Intermediate Macroeconomics* course and serves as a natural benchmark for the syllabus.

Those student who find it difficult to start the study of macroeconomics with Blanchard’s textbook may find useful more elementary text by

 Begg, D., G.Vernasca, S. Fischer and R. Dornbusch *Economics*. (New York:McGraw Hill, 2008) Tenth edition [ISBN 9780077129521]

Given the one-semester length of the course it’s next to impossible to cover all the chapters from the textbook, so the course is bound to be selective. Yet the structure of the course to a large extent constitutes the core of modern macroeconomics. An introduction precedes the theory of **short run** fluctuations which is essentially based on the IS-LM-BP model. Topics 4 and 8 go slightly beyond the main textbook chapters by introducing to students some theoretical tools for the analysis of redistribution policies in a heterogeneous society as well as macroeconomic aspects of trade restrictions, economics sanctions, devaluation wars, etc.

Topics 9 through 14 focus on the **medium run** covering labour market issues and introducing AD-AS framework for the analysis of inflation, unemployment and their trade-off. The role of expectations in the consumption and investment decisions as well as for the consistent macroeconomic policy is explored as a major extension of the IS-LM-AS model.

The **long run** issues of economic development are covered in the final part of the course which introduced the neoclassical growth theory of capital accumulation. The role of exogenous and endogenous technological progress in explaining the evolution of output per worker across countries and over long periods of time completes the course.

The course is deemed to be ‘constructively aligned’. In particular, it has outcome based student oriented design and educational technology with criterion-reference assessment. Yet, it allows for sufficient flexibility in the curriculum to create such a learning environment that helps student make an above mentioned ‘accommodative jump’.

The length of the course, distribution of workload between lectures (64 hours) and seminars (32 hours), structure of the exam (to be based primarily on problems) shapes the content of the course.

Table 2. Workload distribution between classroom hours and self-study

Week	Topic	Total	Classroom activities		Self-study
			Lectures	Classes	
1.	Basic macroeconomic problems and concepts. Macroeconomic variables and problems with aggregation	10	4	2	4
2.	National accounts, total output and national income. Aggregate demand components	12	4	2	6
The short run					

3.	Goods market equilibrium. Keynesian Cross diagram and the multiplier. Fiscal policy rules and balanced budget multipliers	12	4	2	6
4.	IS curve. Fiscal and redistribution policies in an economy with heterogeneous agents	12	4	2	6
5.	Financial market equilibrium in the closed economy. Money supply and money demand. LM schedule. Banking system and the role of CB	12	4	2	6
6.	General equilibrium and macroeconomic policies in the closed economy. Fiscal and monetary policies in the IS-LM model	12	4	2	6
7.	Open economy macroeconomics: BOP, exchange rate determination, CIP, UIP, LOOP. IS-LM-BP model	16	4	2	10
8.	International macroeconomics and policy transmission. Repercussion effects, economic sanctions, trade embargo and capital movement restrictions	16	4	2	10
The medium run					
9.	Labour market, wage and price determination. Unemployment	10	2	2	6
10.	AD – AS model. Sticky prices, wages and information	12	4	2	6
11.	Inflation, expectations and Phillips curve	12	4	2	6
12.	Expectations and microeconomic foundations of aggregate consumption and investment	16	4	2	10
13.	Political economy in macroeconomics. Policy rules vs. discretion. Credibility, accountability, transparency and time inconsistency. Policy goals, targets and instruments.	18	6	2	10
14.	Economic crisis and global imbalances; financial, banking and currency crises. Government debt and monetary union	12	4	2	6
The long run					
15.	Neoclassical growth model (Solow). Returns to scale and production function. Factor accumulation and the role of technological progress. Convergence.	16	4	2	10
16.	Endogenous growth theories and cross-country income differences	12	4	2	6
Total:		216	64	32	120

III. Course content

III.1 Basic macroeconomic problems and concepts. Macroeconomic variables and problems with aggregation

Macroeconomics and its central issues: inflation, unemployment, economic growth, stabilisation policy. The problem of aggregation. Money value of goods as a common denominator.

Aggregate output, gross domestic product, or GDP, final good, intermediate good, value added. Double counting. Nominal GDP, real GDP, GDP growth, expansions, recessions. Labour force, employment, unemployment and unemployment rate, discouraged workers, participation rate.

Underground economy. Price level, inflation, inflation rate, deflation, GDP deflator, index number, consumer price index (CPI), cost of living.

Real vs. nominal variables. Some important national accounting identities.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.1

Further Reading

 Begg, D., G.Vernasca, S. Fischer and R. Dornbusch *Economics*. Ch.15
 Blanchard, O. (2009). The State of Macro. *Annual Review of Economics*, 1, 209–228.

III.2 National accounts, total output and national income. Aggregate demand components

Gross national product and national income. Determinants of consumption (consumption function) and marginal propensity to consume. Consumption function with income dependent MPC. Personal disposable income.

Savings and investment. Savings and marginal propensity to save. Relationship between consumption and savings in a closed economy. Changes in MPC and the effect on savings.

Investment. Savings and transmission mechanism. Interest rate and the present value concept. Marginal propensity to invest. Bonds of the console type (perpetuities). Internal rate of return.

The government sector. Public consumption and the marginal propensity to spend of the government. Government revenues and forms of taxation: lump-sum and proportional (marginal) taxes, progressive and regressive taxes, income and expenditure taxes, corporate tax. Budget surplus and government savings. Tax incentives to save.

The foreign sector. National accounts for the open economy. Demand for export and import, marginal propensity to import. Net exports function with a fixed exchange rate.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.2

Further Reading

 Begg, D., G.Vernasca, S. Fischer and R. Dornbusch *Economics*. Ch.16

III.3 Goods market equilibrium. Keynesian Cross diagram and the multiplier. Fiscal policy rules and balanced budget multipliers

The complete goods market and Keynesian Cross in the closed economy. Characterisation of the equilibrium and the mechanism of adjustment. Autonomous aggregate expenditures, the economy wide marginal propensity to spend and the multiplier. Goods market equilibrium and the multiplier in the open economy.

Government spending and crowding out. The effects of government spending and taxation on output. Government spending multiplier and tax multiplier. Balanced budget multiplier for the different mechanisms of adjustment. Fiscal rules and countercyclical government spending.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.3

Further Reading

-  Mankiw, N. Gregory. "Imperfect competition and the Keynesian cross." *Economics Letters* 26.1 (1988): 7-13.

III.4 IS curve. Fiscal and redistribution policies in an economy with heterogeneous agents

The IS representation of the goods' market equilibrium in the closed economy. Derivation of the IS curve. Shifts in the IS schedule. The interest rate elasticity of investment expenditure function: extreme Keynesian and Classical views. The effects of change in the MPC.

Transfer payments, taxation and redistribution vs. fiscal policies. Income dependent MPC and income distribution. Heterogeneous agents and the total consumption function. Inequality, poverty, and transfer effect. Redistribution policy and poverty-driven inequality. Redistribution and poverty alleviation. Income redistribution, changes in population composition and the consumption function. Means and ends of the redistribution policy. Voluntary redistribution of income via donations.

Corporate profits, corporate taxation and the firms' investment function. Retained and distributed profits, investment decision and dividend policy. The problem of double taxation.

Out-sourcing (out-tendering) and privatisation. Labour and capital income vs. profits.

Essential Reading

-  Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.3

Further Reading

-  Hoshi T., A.K.Kashyap, Japan's Financial Crisis and Economic Stagnation, *Journal of Economic Perspectives*, 18 (1), 2004, pp. 3-26.
-  Ludvigson S.C., Consumer Confidence and Consumer Spending, *Journal of Economic Perspectives*, 18 (2), 2004, pp.29-50.

III.5 Financial market equilibrium in the closed economy. Money supply and money demand. LM schedule. Banking system and the role of CB

Money and Banking. Functions of Money: a Numeraire, Means of Exchange and Store of Value. Demand for Liquid Assets. Liquidity Preference Approach.

Central Bank, Commercial Banks and Supply of Liquid Assets. Money Base, Public Cash, Reserves, Deposits. Money Creation process. Money multiplier, deposit multiplier and loans multiplier. Upward sloping money supply.

Liquid Assets Market Equilibrium. Derivation of the LM curve. Slope of the LM schedule. Excess demand and Excess supply. Monetary Policy and Shifting in the LM schedule. Liquidity trap and zero lower bound.

Essential Reading

-  Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.4

Further Reading

-  Begg, D., G.Vernasca, S. Fischer and R. Dornbusch *Economics*. Ch.18-19

III.6 General equilibrium and macroeconomic policies in the closed economy. Fiscal and monetary policies in the IS-LM model

Notion of general equilibrium in a macroeconomics context. Algebra and geometry of general equilibrium, IS-LM framework. Macroeconomic policies and output determination. Classical and Keynesian views.

Expansionary and contractionary fiscal policy: tax financing, internal debt financing, borrowing from the central bank. Expansionary and contractionary monetary policy, policy mix.

Essential Reading

-  Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.5

Further Reading

-  Begg, D., G.Vernasca, S. Fischer and R. Dornbusch *Economics*. Ch.20
-  Romer, David 'Keynesian macroeconomics without the LM curve', *Journal of Economic Perspectives* 14(2) 2000, pp.149–69.
-  Hoshi, Takeo and A. K. Kashyap 'Japan's financial crisis and economic Stagnation', *Journal of Economic Perspectives* 18(1) 2004, pp.3–26.
-  Hutchison, Michael 'Japan's recession: Is the liquidity trap back?' Federal Reserve Bank of San Francisco. FRBSF Economic Letter/Pacific Basin Notes. 2000–19, 16 June 2000 (available at www.frbsf.org/econsrch/wklyltr/2000/el2000-19.html).

III.7 Open economy macroeconomics: BOP, exchange rate determination, CIP, UIP, LOOP. IS-LM-BP model

Balance of payments: current account, capital account and foreign reserves. Real and nominal exchange rate. Exchange rate determination and the money sector. Foreign exchange market, foreign currency reserves. Appreciation and depreciation of the exchange rate. Exchange rate regimes: fixed and flexible.

Determinants of the trade balance and the Marshall–Lerner condition, the national income identity in an open economy

Uncovered and covered interest parity condition in the financial market, the law of one price.

General equilibrium in an open economy and macroeconomic policies. Capital mobility vs. capital controls. Mundell–Fleming model. Determinants of the BP line, the BP slope under alternative assumptions about international capital mobility.

Monetary and fiscal policies under fixed and flexible exchange rates with perfect, imperfect capital movements and no capital mobility.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch. 18, 19 and 20.1–20.2., 21.

Further Reading

-  Dornbusch, R., S. Fischer and R. Startz *Macroeconomics*. (New York: McGraw-Hill, 2011) Chapters 12.1–12.3, 18.3 and 20.2, 21
-  Mankiw, N. G. *Macroeconomics*. (Worth, 2012) Chapter 6, 13.
-  Calvo, Guillermo A., and F.S. Mishkin. 'The mirage of exchange rate regimes for emerging market countries', *Journal of Economic Perspectives* 17(4) 2003, pp.99–118.
-  Mann, Catherine L. 'Perspectives on the US current account deficit and sustainability', *Journal of Economic Perspectives* 16(3) 2002, pp.131–52.

III.8 International macroeconomics and policy transmission. Repercussion effects, economic sanctions, trade embargo and capital movement restrictions

Relaxing assumption of a "small" open economy. Two-country setting and simultaneous determination of income and exchange rate when countries are main trading partners. Repercussion effects.

Monetary policy abroad: the case of perfect and no capital mobility under alternative exchange rate regimes. Policy transmission and repercussion effects in the case of simultaneous changes in current account and capital account.

Social vs. fiscal policy abroad: sensitivity of macroeconomic outcomes to distribution policy. A shift in demand and transfer problem.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.21

Further Reading

-  Kaempfer, William H., and Anton D. Lowenberg. "The theory of international economic sanctions: A public choice approach." *The American Economic Review* (1988): 786-793.
-  Pape, Robert A. "Why economic sanctions do not work." *International Security* 22.2 (1997): 90-136.

III.9 Labour market, wage and price determination. Unemployment

Noninstitutionalized civilian population, labor force; out of the labor force, participation rate, unemployment rate, separations, hires, quits, layoffs, duration of unemployment, discouraged workers, nonemployment rate, collective bargaining, reservation wage, bargaining power.

Efficiency wage theories, unemployment insurance, production function, labor productivity, markup, wage-setting relation, price-setting relation.

Natural rate of unemployment, structural rate of unemployment, natural level of employment, natural level of output. The types and causes of unemployment: frictional, structural and classical (or real wage) unemployment. Hysteresis.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.6

Further Reading

-  Ball, Laurence and N.G. Mankiw 'The NAIRU in theory and practice', *Journal of Economic Perspectives* 16(4) 2002, pp.115–36.
-  Blanchard, O. 'European unemployment: the evolution of facts and ideas', NBER working paper, No. 11750, 2005.
-  Davis, Steven J., R.J. Faberman and J. Haltiwanger 'The flow approach to labor markets: new data sources and micro-macro links', *Journal of Economic Perspectives* 20(3) 2006, pp.3–26.

III.10 AD – AS model. Sticky prices, wages and information

Aggregate supply (AS) relation. The medium run AS curve and the long run AS curve. Explanations of the upward sloping medium run aggregate supply curve. Sticky wages (Keynesian) model. Classical workers' misperception model, new Keynesian sticky price model, new classical imperfect information model of medium run AS. Expectations and the medium run AS.

The aggregate demand curve. Explanations of the slope.

Equilibrium in aggregate supply- aggregate demand model. Monetary and fiscal policy in the long run and in the medium run. Supply shocks, neutrality of money, stagflation, output fluctuations, business cycles, propagation mechanism.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.7

Further Reading

-  Lucas, Robert 'Understanding business cycles', in K. Brunner and A. Meltzer (eds) *Stabilization of the domestic international economy*. 5, pp.7–29. Also in Estrin, S. and A. Marin *Essential reading in economics*. (Basingstoke: Macmillan Press, 1995) first edition [ISBN 9780312125110] Chapter 16.
-  Zarnowitz, Victor 'Theory and history behind business cycles: Are the 1990s the onset of a golden age?' *Journal of Economic Perspectives* 13(2) 1999, pp.69–90.

III.11 Inflation, expectations and Phillips curve

Functions of money. The transactions demand (Baumol-Tobin model). The speculative theory of money demand: demand for money as a safe asset. The modern quantity theory of money. The monetary base and the money supply. The money multiplier model. Control of the central bank over the money supply.

Phillips curve, wage-price spiral, nominal rigidities, staggering of wage decisions. Modified, or expectations-augmented, or accelerationist Phillips curve. Nonaccelerating inflation rate of unemployment (NAIRU), wage indexation.

Okun's law, normal growth rate, labor hoarding, adjusted nominal money growth, disinflation, sacrifice ratio, seignorage. Rational, myopic, adaptive expectations, perfect foresight. Lucas critique and credibility.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.4, 8-9

Further Reading

-  Barsky R.B., L.Kilian, Oil and macroeconomy since the 1970s, *Journal of Economic Perspectives*, 18 (4), pp.115-134, 2004.
-  Svensson L.E., Escaping from a liquidity trap and deflation: The foolproof way and others, *Journal of Economic Perspectives*, 17 (4), pp.145-166, 2003.
-  Tobin J., Inflation and unemployment, *American Economic Review*, 62 (1), pp.1-18, 1972.
-  Baumol W., The transaction demand for cash: an inventory theoretic approach, *Quarterly Journal of Economics*, 66, pp.545-556, 1952.
-  Friedman M. (1968) "The Role of Monetary Policy". *American Economic Review*, 58, pp. 1-17.
-  Tobin J., Liquidity preference as a behaviour towards risk, *Review of Economic Studies*, 25, pp.65-86, 1958.

III.12 Expectations and microeconomic foundations of aggregate consumption and investment

Keynesian consumption function and Kuznets puzzle. Intertemporal choice model. Life Cycle and Permanent Income theories. PIH under rational expectations.

Barro-Ricardo equivalence. Reasons for the failure of Barro-Ricardian equivalence. Fiscal policy. Implications of Barro-Ricardo equivalence.

Yield to maturity and term structure of interest rates. Stock market and the price of stock. Keynesian theory on aggregate investment. The components of investment spending. Neoclassical model of investment. Accelerator models of investment. Tobin's q-theory

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.14-16

Further Reading

-  Barro, Robert 'Are government bonds net wealth?', *Journal of Political Economy* 82(6) 1974, pp.1095-17.
-  Friedman, Milton A theory of the consumption function. (Princeton, NJ: Princeton University Press, 1957).
-  Hall, Robert, E. 'Stochastic implications of the life cycle-permanent income hypothesis: theory and evidence', *Journal of Political Economy* 86(6) 1978, pp.971-87.
-  Modigliani, Franco 'Life cycle, individual thrift, and the wealth of nations', *American Economic Review* 76(3)1986, pp.297-313.
-  Pentecost E. *Macroeconomics: an open economy approach*. (Basingstoke: Palgrave Macmillan, 2000) Chapters 6-7.

-  Hall, Robert, E. and Dale W. Jorgenson 'Tax policy and investment behaviour', American Economic Review 57(3)1967, pp.391–414.
-  Keynes, John, M. 1936 'The state of long term expectations', Chapter 12 of The general theory of employment, interest and money. Also in Estrin, S. and A. Marin, Chapter 15.
-  Baumol W., The transaction demand for cash: an inventory theoretic approach, Quarterly Journal of Economics, 66, pp.545-556, 1952.
-  Friedman M. (1968) "The Role of Monetary Policy". American Economic Review, 58, pp. 1-17.
-  Tobin J., Liquidity preference as a behaviour towards risk, Review of Economic Studies, 25, pp.65-86, 1958

III.13 Political economy in macroeconomics. Policy rules vs. discretion. Credibility, accountability, transparency and time inconsistency. Policy goals, targets and instruments

The sources of business-cycle fluctuations and benefits of macroeconomic stability. Uncertain outcomes of monetary policy actions. Monetary policy instruments and price stability.

Theoretical foundation of inflation targeting policies, the time-inconsistency problem and the debate between precommitment and discretion in the context of monetary policy.

The implications of the main rules designed by macroeconomists for the conduct of monetary policy. Time inconsistency problem and its solutions: constitutional rules, reputation, delegation to an independent authority with different preferences/incentives (independent central banker).

Fiscal policy rules and the government budget constraint. The Ricardian equivalence proposition for the conduct of fiscal policy. theoretical underpinning of fiscal policy and the debate between the active or passive use of fiscal policy. Discretionary use of fiscal policy over time.

Determinants of seignorage, and the links between the budget deficit and inflation.

Essential Reading

-  Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.17, 23-26.

Further Reading

-  Alesina A., The political economy of the budget surplus in the United States, Journal of Economic Perspectives, 14(3), pp.3-19, 2000.
-  Bernanke B.S., F.S.Mishkin, Inflation targeting: a new framework for monetary policy? policy, Journal of Economic Perspectives, 11(2), pp.97-116, 1997.
-  Chari V., J.K.Patrick, Modern macroeconomics in practice: how theory is shaping policy, Journal of Economic Perspectives, 20(4), pp.3-28, 2006.
-  Fisher S., R.Sahay, C.A.Vegh, Modern hyper- and high inflations, Journal of Economic Literature, 40(3), pp.837-880, 2002.
-  Modigliani F., The monetarist controversy, or, should we forsake stabilization policies? American Economic Review, 67(2), pp. 1-17, 1997.
-  Sargent T.J., N. Wallace, Rational Expectations and the Theory of Economic Policy, Journal of Monetary Economics, July 1976, pp.199-214.
-  Taylor J.B. An historical analysis of monetary policy rules, NBER working paper, w6768, 1998
-  Taylor J.B. Reassessing discretionary fiscal policy, Journal of Economic Perspectives, 14(3), pp.21-36, 2000.

III.14 Economic crisis and global imbalances; financial, banking and currency crises. Government debt and monetary union

Gold standard, optimal currency area. Euro and Maastricht Treaty, European Central Bank (ECB), hard peg, dollarization, currency board.

Global financial crisis in 2008. Subprime borrowing and global imbalances. 'Unconventional' monetary (quantitative easing) and fiscal policies, savings glut.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.1, 21, 22, 25.5

Further Reading

-  Berkmen, Pelin, et al. The global financial crisis: Explaining cross-country differences in the output impact. No. 9-280. International Monetary Fund, 2009.
-  Borio, Claudio, and Piti Disyatat. Global imbalances and the financial crisis: Link or no link?. No. 346. Bank for International Settlements, 2011.
-  Claessens, Stijn, et al. "Cross-country experiences and policy implications from the global financial crisis." *Economic Policy* 25.62 (2010): 267-293.
-  Fratzscher, Marcel. "Capital flows, push versus pull factors and the global financial crisis." *Journal of International Economics* 88.2 (2012): 341-356.

III.15 Neoclassical growth model (Solow). Returns to scale and production function. Factor accumulation and the role of technological progress. Convergence

Kaldor's (1963) stylized facts and recent findings about economic growth. Growth miracles and growth disasters. Factor accumulation, stability of the worldwide economic growth and cross-country income differences.

Basic assumption of the Solow model. Neoclassical production function, constant return to scale and Inada conditions. Dynamics of the model and the concept of the balanced growth path. Policy shocks and transition dynamics. Golden rule of capital accumulation and dynamic efficiency.

Growth accounting. Absolute and conditional convergence. Quantitative measure of the speed of convergence. Convergence clubs and the identification problems with cross-country regressions: selection bias and measurement error. Saving and investment in growth regressions. Convergence and the dispersion of per capita income: β - and σ -convergence.

Essential Reading

 Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch.10-13

Further Reading

-  Romer, D. (2012). *Advanced Macroeconomics*. 4th edition, McGraw-Hill, Ch.1 pp. 6-27.
-  Barro, R., Sala-i-Martin, X. (2003). *Economic Growth*. 2nd edition, MIT Press., ch.1, pp.14-26.

-  Temple, J. (1999). The New Growth Evidence. *Journal of Economic Literature*, 37(1), 112-156.
-  Baumol, W. J. (1986). Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show. *American Economic Review*, 76(5), 1072-1085.
-  DeLong, J. (1988). Productivity Growth, Convergence, and Welfare: Comment. . *American Economic Review*, 78(5), 1138-1154.
-  Baumol, W. J., Wolff, E.N. (1988). Productivity Growth, Convergence, and Welfare: Reply. *American Economic Review*, 78(5), 1155-1159.

III.16 Endogenous growth theories and cross-country income differences

The AK model and the absence of diminishing returns to capital. Endogenous growth with transitional dynamics and CES production functions. Growth models with poverty traps.

Accumulation of knowledge and exogenous allocation of resources to R&D sector. Dynamics of knowledge accumulation in the model without capital and in the generalised model. The importance of returns to scale to produced factors and the role of population growth.

Nature of knowledge (non-rivalry and non-excludability) and determinants of its accumulation. Incentives for R&D and innovations. Opportunities for talented individuals and learning-by-doing. The Romer model of endogenous technological change.

Essential Reading

-  Blanchard, O. and D.R. Johnson. *Macroeconomics*. Ch. 11.4, 12 and 13.4.
-  Romer D. (2012) *Advanced Macroeconomics*. 4th edition, McGraw-Hill, Ch.3.1-3.5 pp. 101-134.

Further Reading

-  Barro R., Sala-i-Martin X. (2003) *Economic Growth*. 2nd edition, MIT Press., ch.1.3, pp. 38-56.
-  Besley, Timothy, and R. Burgess 'Halving global poverty', *Journal of Economic Perspectives* 17(3) 2003, pp.3-22.
-  Bosworth, Barry, and S. M. Collins 'Accounting for growth: comparing China and India', *Journal of Economic Perspectives* 22(1) 2008, pp.45-66.
-  Jones, Charles I. *Introduction to economic growth*. (Norton, 2002) second edition [ISBN 9780393977455]. Chapters 3 and 4.
-  Romer, Paul M. 'The origins of endogenous growth', *Journal of Economic Perspectives* 8(1) 1994, pp.3-22.

IV. Forms of assessment

IV.1 Formative assessments

The following forms for the current assessment are employed in order to correspond to the aims of the course and intended learning outcomes in particular

- Quizzes based on Home assignments
- Q&A - Questions and Answers (questions based on essential reading and lecture material) during contact sessions

- Non-graded Home Assignments
- Mock Group Presentation

IV.2 Summative assessments

Summative assessment criteria and grade determination are announced at the beginning of the course [% weight in the final grade]

- Mid-term closed-book written test (2 hours individual in class) [15%]
- Essay based on Group presentation [25%]
- Essay on individual research topic [25%]
- Final closed-book exam (4 hours individual in class) [35%]

V. Teaching methods and education technologies

V.1 Teaching strategy

The course instructor should stress the importance of repeated use of theories and sometimes technically complex methods (ILO 2,3) to learn habitual ways of coping with difficulties when reading professional literature on the subject (ILO 4,5,6). This is sort of justification for the advanced course on macroeconomics to be primarily 'problem-based'. This approach and corresponding exam structure is required for the course to be compatible with the accepted Western educational standards. As most of the theory based courses this is also unable to facilitate learning that is directly applicable in every context (especially outside the academic environment).

To deal with such an expected mismatch with students' expectations, it is reasonable to offer a student-oriented educational strategy in the form of 'conversational framework' for reflective learning. With the key objective to get students to objectify and negotiate their subjective meanings the instructor should attempt to facilitate reflective learning through group debates, group assignments (GRP) and individual essays that cumulatively account for more than half of the final grade. The use of these communicative, adaptive and interactive media aims at the design of affordance for high level learning (ILO 4 and 5).

At the instructional level an increase of the expected return on interactive activities is secured by adhering to the following teaching methods. Lectures have an overlapping structure with seminars: lecture material and corresponding home assignments are discussed in the next week's class. This creates a more comfortable learning environment for students who are not very quick in grasping new ideas (especially those who are new to the HSE system). At the same time such a structure allows the instructor to cover more of technically difficult material outside the classroom and concentrate on more interactive types of in-class activity. In particular, each lecture is devised into four time slots:

- 1) *revision* of the previously taught material that facilitates the feed-back, feed-forward learning and is assessed via quizzes),
- 2) *presentation* of new material using animated slides with some intentionally blank spaces to be filled in by students,
- 3) *practicing* (eg. deriving first-order conditions, completing proofs, formulating pre-conceptions, investigating and analyzing within TPS framework),
- 4) *applying* to real-life (relating experience to theory, theory to practice, generating puzzling questions for further discussions in class to trigger toil learning into exuberance learning.) Feed-back/feed-forward learning processes are managed by means of weekly office hours to help students create their individual meanings and concepts as well as relax their learning constraints.

Important element of teaching strategy should be office-hours. Having introduced 'conversational framework' the lecturer commits providing personal feedback on learning for 3-4 students every week. Students are obliged to ask at least couple of questions (even if they think they don't have). Additional to this traditional form of communication an on-line and off-line Q&A session was introduced via <https://piazza.com/hse.ru/fall2014/macro/home> interface (to be further transferred to HSE Learning Management System). This forum allows both for personal and anonymous questions from students to provide them with an opportunity to choose time and means of 'out of campus' conversation with the teacher.

Facilitated seminars enable adaptive, communicative and interactive medium to give maximum support to student: problem solving, discussing and presenting; solving typical problems and commenting on home assignments with special attention to marking criteria and the relative weights for different sub-questions. Since both individual and social activity play a role in the construction of knowledge I facilitate discussion sessions for students to articulate their subjective understanding. Further I explain how flexible lecture plan and variety of learning resources provides students with non-linear pathways through different on-line materials and helps them extend their personalized knowledge in macroeconomics through out of class e-learning and group activities.

V.2 Learning activities

Students adopt their own learning paths taking into account their backgrounds, incentives, career preferences and time-constraints. In particular, students may 1) concentrate their learning efforts on different tasks; 2) they may also select between 'problem-solving' and 'open-end' types of questions (Section D in mid-term test or final exam); 3) choose individually essay topic and 4) focus on specific stream of literature for GRP presentation. The course assessment strategy being flexible is completely aligned with these learning activities. The intension for such a flexible assessment strategy is to increase students' engagement in learning by allowing them to select between assessment tasks (and corresponding learning activities) 'for bigger accommodative jump'.

In the course students are pushed to work in groups (preparing for home assignments or GRP). Such a learning environment is designed to introduce greater flexibility of the syllabus and personalize students' knowledge (since they select the list of papers to present by themselves) to encourage deeper learning further assessed as ILO4 and ILO5. For instance, GRP presentation aims at creating a consistent picture of the current state of affairs in the given field of research that is not covered in lectures. Each presentation is assessed by the tutor, while individual marks (depending on relative contribution of the each member of the group) are graded by peers. In turn, GRP work offers students the means to select and negotiate their own task goals, generate questions, reflect on the comparison between theirs and teachers conceptions, analyse macroeconomic work horse models, relate them to practice (data), and produce personal judgments of normative policy propositions (ILOs 4 and 5). By articulating personalized conceptions and perspectives students deliver solutions to research problems through applying good group working practices and achieve ILO6.

V.3 Learning aids

Implementation of a 'conversational framework' for the course requires tailored educational technologies and corresponding learning aids. The course textbook has a set of problems after each chapter, but normally students fail when attempting to solve these problems without guidance. Such a 'gap in understanding' is typical for 'problem based' courses and requires adaptation of facilitated learning technologies. The following resources support students' learning.

Lecture slides are distributed before lecture, so students don't need to copy them. However, in the printed form some spaces in formulae, graphs and propositions are intentionally left blank to facilitate students' lecture participation and attention.

Lecture notes correspond to selected topics in the course curriculum and indicate the minimum requirements in terms of scope and depth of the course. Clear and short presentation of the technically complicated and mathematically intensive part of the course with all necessary proofs and derivations serves as a reliable reference point for self-study.

Marking-schemes to non-graded home assignments and previous year exams familiarise students with the particular type of problems they may face in the mid-term test and final exam. I encourage students to work together on the problems and not just to find closed form analytical solutions but also to identify hidden assumptions, interpret results and provide for economic intuitions. Sample solutions are discussed in class to construct mutual understanding of what the assessment criteria would be. Detailed marking schemes to home assignments with clear description of relative weights are distributed to students at the week that follows corresponding class.

Useful web links



<https://piazza.com/hse.ru/fall2014/macro/home>



[Dynamics in the Solow-Swan Growth Model"](#)

from [the Wolfram Demonstrations Project](#)

<http://demonstrations.wolfram.com/DynamicsInTheSolowSwanGrowthModel/>

V.4 Essay based on Group presentation

1. Each group of students is expected to have prepared a brief but well structured macroeconomic profile of a selected country. Special attention is to be paid at the list of references and data sources.

2. The essay is to be focused on both the medium run and the long run issues of the country's economy and must contain the following information:

- GDP structure and its dynamics (the longer the time-series the better)
- The essence of recently pursued macroeconomic policies
- Population structure (age and gender) and its dynamics
- Human capital characteristics (education, skills, health)
- Physical capital characteristics (stock of capital, investment vs. savings rate, depreciation)
- Natural resources, geography and climate
- Technological capacity, R&D sector and knowledge accumulation, social infrastructure

3. The essay has to conclude on the major determinants of economic situation (possibly different at different stages of development) and discuss the future perspectives

4. Having the study at hands students join the in-class round table discussion that aims at resolving the issue of convergence. In particular, students have to be able to identify the basic growth facts to persuade each other that their countries belong to a single club of convergence.
5. Students then have to exchange their essays within the identified clubs for peer review. Every student has to comment the peer's essay in the form of critical support in writing and return it back within two days. The copy of this referee report of sorts has to be sent to the teacher.
6. Within the next 5 days student has to revise and resubmit the final version of the essay for marking. The submitted portfolio should contain three texts in the MSWord format: draft text, referee report with tracked records and the final version.

V.5 Essay on an individual research project

An essay as an individual learning activity aims at organising coherent forms of communication of economic reasoning and presenting in writing to diverse professional audience. Specifically, it develops students' ability to:

- Select interesting (debatable, controversial) and relevant topic in macroeconomics;
- Identify and clearly state the problem using terminology of macroeconomic analysis;
- Illustrate the adequacy of macroeconomic models through applying theoretical analysis (IS-LM-AS, IS-LM-BP, Phillips curve, Solow and endogenous growth and other relevant models) to selected problem;
- Assess the potential and limitations of these models;
- Explain and justify positive macroeconomic policy propositions in written communication.

Scope of the essay

The essay topic has to tackle an interesting and up to date macroeconomic issue discussed in respected general interest newspapers and magazines, such as The Economist, Wall Street Journal, Financial Times, Moscow Times, Ведомости, Коммерсантъ, etc. Do not take the case description from the academic journals or books.

The essay should provide evidence that student has critical thinking and is able to apply relevant theories to the analysis of real-life issues. In effect, this type of learning activity replicates the essence of the group work project but assess students individually. Presentation skills are also important but students now communicate their ideas in writing rather than in oral form.

The length of the essay is recommended to be about 2,000 words but can be less. Graphs and formulas are very welcomed if they are carefully explained and interpreted in the text.

VI. Sample Exam questions and tasks

VI.1 Sample non-graded home assignment designed for improving reading skills and critical thinking

Question 1. Multiple Choice Question

1. The entry of EasyJet to Russian transportation market
 - (a) Makes the IS curve flatter;
 - (b) Makes the IS curve steeper;
 - (c) Leaves the IS curve intact;
 - (d) Shifts IS curve upwards.

Question 2. Fiscal rules

The Maastricht criteria for European Union member states to enter European Economic and Monetary Union (EMU) and adopt the euro as their currency require that the ratio of the annual government deficit to gross domestic product must not exceed 3% at the end of the preceding fiscal year. For political reasons as the member states' governments wish to keep control on spending. Thus the fiscal adjustments would come through changes in the (proportional) tax rate. Assuming a closed economy analyze the effects of commitment to Maastricht criteria on the IS curve.

- a) Derive the economy's multiplier before the government commitment.
- b) Define the new budgetary rule and find the new multiplier
- c) How would the position of IS curve be changed?
- d) Discuss the three possibilities mentioned in c) by employing capital formation equation and assumption of real interest rate to be fixed at the initial level r_0 . HINT: Compare the initial budget deficit and the newly committed one.

VI.2 Sample problem set for the mid-term test and final exam

Section A (answer ALL the questions)

-
1. Economy A with proportional taxes is closed and the government adjusts its spending to the level of taxes raised. Economy B is open and has lump-sum tax system. Comparing the balanced budget multipliers of the two economies one can conclude that:
 - a. $\text{Mult A} < \text{Mult B}$;
 - b. $\text{Mult A} = \text{Mult B}$;
 - c. $\text{Mult A} > \text{Mult B}$;
 - d. The multipliers can not be compared due to insufficient information.
 2. A project yields £1500 every year for 2 years. What is the maximum disbursement you will agree to invest in the project had the interest rate been 5%:
 - a. 2929;
 - b. 2927;
 - c. 2788;
 - d. 2790.
-

3. An unplanned decrease in stocks means:
 - a. The economy is in equilibrium in the goods market;
 - b. There is excess supply in the goods market;
 - c. There is excess demand in the goods market;
 - d. We cannot infer anything from this information.

4. Easy monetary policy brings about:
 - a. An excess supply of bonds and their price will fall;
 - b. An excess supply of bonds and the interest rate will fall;
 - c. An excess demand for bonds and their price will increase;
 - d. An excess demand for bonds and the interest rate will rise.

5. In a closed economy with fully flexible prices and wages, a balanced budget fiscal expansion will lead to:
 - a. A crowding out of investment by exactly the amount of additional government expenditure;
 - b. No changes in output and savings due to complete crowding out effect;
 - c. An increase in output and a decline in investment due to partial crowding out effect;
 - d. None of the above.

6. An increase in the economy wide marginal propensity to spend:
 - a. Will make the IS flatter and therefore, the AD will be steeper;
 - b. Will make the IS flatter and therefore, the AD will be flatter;
 - c. Will make the IS steeper and therefore, the AD will be flatter;
 - d. Will make the IS steeper and therefore, the AD will be steeper.

7. In an open economy with perfect capital mobility and a fixed but adjustable exchange rate, devaluation policy will:
 - a. Have no effect on the economy;
 - b. Lead to an increase in output and an increase in the supply of liquid assets;
 - c. Lead to an increase in output and a fall in the supply of liquid assets;
 - d. Lead to a fall in output and a decrease in the supply of liquid assets.

8. In an open economy with perfect capital mobility and a flexible exchange rate an increase in international interest rates will lead to:
 - a. No changes in trade deficit;
 - b. An increase in net exports;
 - c. A decrease in net exports;
 - d. An increase in domestic interest rates by monetary contraction.

9. In an open economy with no capital mobility and flexible exchange rate an increase in government spending will:
 - a. Have no real effect;
 - b. Lead to an increase in output;
 - c. Lead to a recession;
 - d. Lead to monetary contraction.

10. An increase labour supply would cause:
 - a. a decrease in nominal wages;
 - b. no change in nominal wages;

- c. an increase in nominal wages;
 - d. uncertain effect on nominal wages.
-

Section B (answer only TWO questions)

- B1. 'If all prices and wages are fully flexible in the short run then the aggregate supply (AS) curve is vertical.'
 - B2. 'An increase in a central bank's discount rate will reduce the monetary base.'
 - B3. 'An increase in the level of money wages implies the aggregate supply (AS) curve shifts to the right.'
 - B4. 'According to uncovered interest parity (UIP), a higher domestic nominal interest rate is associated with an expected depreciation of the domestic currency.'
 - B5. 'A minimum wage law can be a cause of classical unemployment.'
-

Section C (answer both questions C.1 and C.2)

Problem C.1. Consider a closed economy with fixed prices and wages.

- (a) Suppose the demand for money is given by

$$M^d/P = m_0 + kY - hr,$$

where M^d is nominal money demand, P is the price level, Y is real income, and r is the interest rate. Assume the price level is fixed at $P = 1$. Suppose that the central bank fixes the money supply $M^s = M$.

Show that the slope of the LM curve (representing money-market equilibrium) is

$$dr/dY = k/h$$

Which values of the parameters k and h represent the case of money demand that is inelastic with respect to income? Using the equation above, deduce that the LM curve is horizontal in this case. **(7 marks)**

(b) Goods market equilibrium is where output is equal to the sum of consumption, investment, and government spending: $Y = C + I + G$. The consumption function is $C = C_0 + c_1(Y - T)$ and the investment function is: $I = I_0 - br$. Government spending $G = G_0$ and taxes $T = T_0$ are exogenous.

Consider an economy where the LM curve is horizontal, as in part (a). Suppose that households increase their desire to save, which can be interpreted as a fall in autonomous consumption C_0 . What are the effects on output Y and national saving S_N ? (Recall that national saving is defined as $S_N = (Y - T - C) + (T - G)$.) Explain your answer intuitively. **(7 marks)**

(c) Repeat the analysis of part (b) when investment depends positively on output, as implied by the equation

$$I = I_0 + aY - br$$

Explain the intuition for the differences you find compared with your answers to part (b). **(6 marks)**

Problem C.2. Consider the Solow model of economic growth. Assume the production function is $Y = K^{1/2}L^{1/2}$,

where Y is output, K is the capital stock, and L is the labour force. The labour force (assumed equal to the population) grows at a constant rate n . The capital stock depreciates at a constant rate δ . There is no exogenous technological progress ($g = 0$). The saving rate is s .

(a) Let $y = Y/L$ and $k = K/L$ denote output per person and capital per person. Show that the production function implies:

$$y = f(k) = k^{1/2}$$

The dynamics of the capital stock per person are described by the equation: $\Delta k = sf(k) - (\delta + n)k$

(you are not required to derive this equation). Show how the steady-state stock of capital per person is found using a diagram and explain why the economy will converge to this point in the long run.

Using the diagram, find the effects of a rise in the saving rate s on steady-state capital and output per person. Sketch a graph showing the path of capital and output per person over time during convergence to the new steady state. **(7 marks)**

(b) Let $c = C/L$ denote consumption per person. Given the saving rate s , consumption per person is determined by the equation:

$$c = (1 - s)f(k)$$

The Golden-rule level of the capital stock k^* is the level that maximizes steady-state consumption per person. Using your diagram or using algebra, explain why the Golden-rule capital stock is the solution of the equation:

$$f'(k^*) = \delta + n$$

Assume that the capital stock is initially below the Golden-rule level. The saving rate is now increased to allow the economy to reach the Golden rule. Sketch a graph showing the path of consumption over time following this change in the saving rate. **(7 marks)**

(c) Suppose the saving rate is $s = 0.2$, population growth is $n = 0.01$, and the depreciation rate is $\delta = 0.09$. Calculate whether the economy described by these parameters requires a higher or a lower saving rate to reach the Golden-rule level of capital. **(6 marks)**

The December 14, 2010 issue of the Wall Street Journal ran an article entitled *Official Relieves Pressure on BOJ*. The article states:

“The chief spokesman for Japan's government said additional monetary easing, including setting an inflation target, won't help Japan conquer deflation. He also suggests Tokyo won't press the Bank of Japan for more steps to prop up the economy anytime soon.

Yoshito Sengoku said in an interview Japan has experienced continued price declines despite years of aggressive easing policies from both the monetary and fiscal sides, a phenomenon that convinces him that deflation is caused by the nation's proximity to lower-cost economies like China and the nations in South East Asia.

‘Some people seem to believe the BOJ can generate an adequate level of inflation by just printing money. But I don't think that's the case,’ said Mr. Sengoku, who serves as chief of staff to Prime Minister Naoto Kan.”

- a) Suppose one takes Mr. Sengoku's conjecture that lower-cost economies like China are causing deflation in Japan as operating through a reduction in P^* in our model. In this case, does Mr. Sengoku's conjecture match with the long-run predictions of the small open economy flexible exchange rate model developed in class? **(10 marks)**
- b) Use the relevant model to evaluate Mr. Sengoku's claim that additional monetary easing won't help Japan conquer deflation. In particular, compare the long-run effect on the price of domestically produced goods of a permanent increase in the money supply in a closed economy and a small open economy with flexible exchange rates. **(10 marks)**

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