# Economics 728 - Macroeconomic Theory for Public Policy (Sept 2015)

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This course has three purposes: (i) to introduce students to the research methods of modern macro-economics, (ii) to investigate major controversies in the field, and (iii) to use these tools to address several policy issues. Some of these policy issues can be summarized by the following questions. Should monetary policy target the price level, nominal GDP, the inflation rate, or the exchange rate? Does quantitative easing relieve monetary policy from the zero-lower bound constraint on interest rates, or is fiscal policy needed to increase the economy's built-in stability features? Can fiscal policy have a significant effect on average living standards by reducing unemployment, reducing income inequality, and raising productivity growth? Are the options for policy to raise long-run living standards significantly lessened by increased globalization and our aging population?

The following topic outline indicates the required reading (pages from the text), and the dates for each lecture.

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Cyclical Unemployment, Inflation Control and Stabilization Policy

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| 1. The Neoclassical Synthesis: Keynes and the Classics | pages 1-5, 16-17, 22-29 | Sept 8 |
| 2. Fiscal and Monetary Policy | pages 29-38 | Sept 9 |
| 3. Expectations Effects and Built-In Stability | pages 39-46, 53-58 | Sept 15 |
| 4. Micro-Foundations and the Lucas Critique | pages 67-89 | Sept 16 |
| 5. The New Neoclassical Synthesis | pages 93-95, 122 | Sept 22 |
| 6. Policy Analysis Using the New Synthesis | pages 58-66 | Sept 23 |
| 7. Review for Test 1 | | Sept 29 |
| 8. Test 1 | | Sept 30 |

Financing the Government: Taxes, Deficits and Debt

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|---|---|---|
| 1. The Optimal Inflation Rate and Dynamic Consistency | pages 150-162 | Oct 6 |
| 2. New Classical Macroeconomics | pages 96-111 | Oct 7 |
| 3. Budget Deficits and Government Debt | pages 172-181 | Oct 20 |
| 4. Taxing Consumption and Natural Resource Use | pages 228-234, 245-252 | Oct 21 |
| 5. Extended Growth Analysis | pages 234-239 | Oct 27 |
| 6. Tax Reform | pages 239-245 | Oct 28 |
| 7. Review for Test 2 | | Nov 3 |
| 8. Test 2 | | Nov 4 |

Structural Unemployment, Poverty and Productivity Growth

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| 1. Efficiency Wages and Multiple Equilibria | pages 184-89, 203-7, 219-227 | Nov 10 |
| 2. Unions and Fair Wages | pages 189-192 | Nov 11 |
| 3. Poverty and Globalization | pages 208-216 | Nov 17 |
| 4. Productivity Growth | pages 253-266 | Nov 18 |
| 5. Tax Reform | pages 276-292 | Nov 24 |
| 6. Equity and Efficiency: Unemployment and Growth | pages 292-298, 272-275 | Nov 25 |
| 7. Review for Test 3 | | Dec 1 |
| 8. Class Discussions Part I | | Dec 2 |
| 9. Class Discussions Part II | | Dec 8 |

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Reading Material:

**Macroeconomics: The Development of Modern Methods for Policy Analysis** (Edward Elgar, 2014) **–** written by the instructor – is the course text. This text is available from the campus Bookstore. There is one additional reading – a policy report issued recently by the instructor:
http://www.cdhowe.org/pdf/Commentary_412.pdf

Practice Questions:

Practice questions are available at http://goo.gl/mej8LJ Gaining experience with these questions is a central part of the course. You are *strongly* encouraged to try these questions *before* they are discussed during the second half of the Wednesday meeting each week.

Evaluation:

There are three take-home assignments (one pertaining to each third of the course), and three two-hour tests (one covering each third of the course). There is no final exam covering the entire course, but our final two classes will involve students giving short verbal explanations of key concepts (that have emerged throughout the term) - for example: forward guidance, second-best, Lucas critique, inverse elasticity rule. The list of concepts will be distributed well before these discussion sessions. All students are encouraged to contribute to the brief discussion of each topic during these sessions. The first two tests take place during our standard lecture time slots (see the outline on the previous page). The third test will be scheduled to occur within the final exam period at the end of term. The final mark is calculated as follows: best term test: 30 marks; other two term tests: 20 marks each; three assignments: 7.5 marks each; participation in the December 3 discussion session: 7.5 marks

Office Hours:

Tuesdays (2:30-3:30) and Wednesdays (1:30-3:00) are time available without prior consultation. If these times are not convenient, please make appointments since many other options are possible.

Learning Objectives:

The following check-list should help students focus on the important messages that emerge from the course.

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## **Cyclical Unemployment, Inflation Control and Stabilization Policy**

*after studying this material you should be able to*:

- Appreciate the neoclassical synthesis - a dynamic model that has the basic Keynesian feature in the short run (output is demand determined as the price level is historically given when an exogenous change occurs) but classical features in full equilibrium (prices fully adjust and output is supply determined)

- Calculate the impact effect and the undiscounted cumulative effect of one-time permanent events

- Identify the requirement for the system to converge to full equilibrium. Use this stability condition as classicals do (to help sign static multipliers (apply the correspondence principle))

- Use the stability (and speed) analysis as Keynesians do (to assess how ongoing policy reactions and changes in institutional arrangements (such as the degree of price flexibility)) affect the likelihood of convergence

- Appreciate the Lucas Critique - that it is only agents' objective functions, not their decision rules, that should be unchanged when we examine alternative policies, and that to respect this critique we need to check (from an explicit micro base) whether each private-sector equation in our macro model needs to be re-derived every time a new policy is considered

- Understand that the "new" consumption, investment and Phillips-curve functions do not need to be re-derived, since we have established that they involve only primitive (taste or technology) coefficients (for example – the rate of time preference in the "new" consumption function)

- Analyze an ongoing series of temporary shocks (instead of a one-time permanent shock) by casting models as discrete-time stochastic systems. Calculate both the stability condition in this environment and the asymptotic variance of the endogenous variables, so that we can determine which policies represent "built-in stabilizers" or "shock absorbers"

- Pursue these same issues when the model embraces rational expectations on the part of the agents who populate the model - that they forecast the endogenous variables in a way that is fully consistent with how these variables behave within the model

- Be able to use expectations operators and the undetermined-coefficient solution procedure for deriving the properties of these rational-expectations models - that constitute the New Neoclassical Synthesis

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## Financing the Government: Taxes, Deficits and Debt

*after studying this material you should be able to*:

- Appreciate that it is better for the stabilization authority to follow a policy rule - compared to initiating a discretionary policy each period - if discretion involves creating surprises (since the rule has a stabilizing effect on expectations). But a rule can involve the authority engaging in predictable feedback (and this is often best). All modern stabilization policy analyses respect this insight by focusing on alternative "aggressiveness" parameters within policy reaction functions.

- Understand that there is often a dynamic-consistency challenge in policy making, since with time moving in only one direction, there is no way today's authority can credibly constrain what the policy maker may do in the future. The up-to-date application of this challenge – applied to monetary policy – concerns "forward guidance."

- Understand that several issues arise when trying to decide the "optimal" inflation rate: efficiency considerations (Friedman's proposal, the inverse elasticity rule, optimal tax analysis), CPI measurement bias, and nonlinearities (in both the short-run Phillips curve and the Taylor rule (the zero lower bound on nominal interest rates))

- Understand the key features of the New Classical macro model (also referred to as RBC (real business cycle) theory). This approach was the first to fully embrace the drive for explicit micro foundations. All markets clear at all times in this approach. Employment fluctuations stem from productivity shocks that shift the labour demand curve. Households adjust labour supply over time to ensure that they work more only in those periods when they expect to be well compensated.

- Appreciate that the baseline version of the New Classical model has been extended in several ways to better match the observed cyclical fluctuations in real wages and employment, and to rely less on technology shocks with exogenously assumed persistence to be the ultimate driver of business cycles. This approach still has difficulty matching the data (especially the correlation between real output and the nominal money supply over the cycle). This is why the New Neoclassical Synthesis approach adds temporarily sticky prices (with micro foundations) to this model. The new classical work has contributed two things: it led to the new synthesis, and it is an excellent vehicle for examining long-run (non-business-cycle) questions such as a comparison of the inflation tax and the payroll tax.

- Understand which fiscal policy regimes lead to an explosive debt-to-GDP ratio and which do not, and appreciate that the Keynesian strategy of balancing the budget over the cycle (rather than balancing the budget each year) makes a limited contribution to decreasing output volatility. While a deficit lessens the size of an initial recession, the need to work the debt back down later on means that there is a slower recovery.

- Understand both traditional growth theory (the Solow model) and the more recent micro-based model that respects the Lucas critique. Since the micro-based model involves forward-looking households (the Ramsey model) and therefore more complicated dynamics, we use *phase diagrams* to determine the policy implications in that setting. Use phase diagrams to examine many developments such as a falling population growth rate (which is one dimension of an aging population)

- Use growth models to explain how pro-savings initiatives raise long-run living standards, and appreciate that there are two income-distribution implications involved. First, there is short-term pain to get the long-term gain (so there is redistribution across generations (from old to young)). Second, in a small open-economy setting, the distribution effect favours capitalists, since there is no gain for labour. In short, neither tax breaks for savers (so-called "trickle-down economics") nor government deficit reduction bring higher living standards for labour in a small open economy

- Understand the basic analysis of non-renewable resources and growth. There is an externality involved with natural resource depletion which provides the efficiency case for the government to use taxes (such as a carbon tax) to generate a slower utilization rate. The analysis shows that there is short-term pain, but long-term gain, involved in slowing our rate of natural resource depletion, and that it takes longer for the long-term gain to arrive (when compared to more traditional pro-savings initiatives). Despite this fact, the case for incurring the short-term pain becomes ever more compelling as the "cost disease of the service sector" looms larger over time.

- Appreciate the controversy involved in selecting a social discount rate to be used in benefit-cost analyses of initiatives (such as climate change) that involve short-term pain for long-term gain. One the one hand, psychologists have shown that a constant exponential discount rate does not appear to describe peoples' preferences for time horizons beyond about 25 years. In addition, benefits that do not materialize for a long time have essentially a zero present value with exponential discounting. On the other hand, plans are dynamically inconsistent without exponential discounting, so we are unable to use standard microeconomic theory to address the Lucas critique without embracing exponential discounting.

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## Structural Unemployment, Poverty and Productivity Growth

*after studying this material you should be able to*:

- Understand two of the three main theories of structural unemployment: efficiency-wage theory (in which labour market failure stems from asymmetric information with firms using high wages to raise worker productivity), and "fair" wage models (in which labour market failure stems from firms needing to respect a societal norm that wages cannot be "too low"). While the formal versions of this second approach involves union-firm interactions, since the union plays the role of imposing the societal norm, many analysts are comfortable applying this model beyond a union setting.

- Derive the effects of various fiscal policies (such as payroll tax changes) on the level of structural unemployment. This analysis involves two stages. First we do micro analysis (eg – derive the first-order conditions for profit maximization) to identify the two relationships involving wages and employment. Second, we use these two relationships at the macro stage to analyze policy.

- Appreciate that these labour market models can provide a rationale for interpreting unemployment as a social problem (as "involuntary" (to use Keynes' term), not as "voluntary" leisure (as emphasized by Friedman and Lucas)). The basic point is that - with a well-identified source of market failure - optimization at the individual level does not generally lead to the social optimum. From such a "second-best" starting point, it is possible for policy to improve the situation

- Examine multiple-equilibria - a phenomenon that opens the door for an important second avenue through which a Keynesian approach to macroeconomics can matter. Instead of conceding "the" long-run outcome to the classicals and (instead) focusing only on convergence (instability) problems (as Tobin suggested), with multiple equilibria Keynesians can rigorously argue that policy may have more than transitional benefits; policy can shift the economy to a preferred long-run outcome

- Appreciate that rising inequality has many causes, for example: (i) the fact that technical change has been skill-biased and that our investment in education has slowed down in recent times (so the supply curve of skilled workers is no longer shifting to the right as rapidly as the demand curve), and (ii) increased globalization (out-sourcing decreases the demand for the unskilled in developed countries). But, whatever causes it, inequality is difficult to address. Governments need revenue to fund anti-poverty programs, and it is impossible to get that revenue from capital owners, since capital is very mobile internationally. The "globalization constraint" is that taxes aimed at capital end up being borne by the captive factor - unskilled labour – the very group that policy is trying to help

- Understand that - when there is *both* involuntary unemployment and perfect international mobility of capital – both factors involve a perfectly elastic supply. So both are unappealing items to tax. But, with a distortion only in the labour market, there is "too little" labour and "too much" capital being used. This is the "second-best" intuition behind our most interesting result: despite creating a distortion in the capital market, financing an employment subsidy by levying a tax on capital can lead to Pareto improvement (winners and no losers)

- Understand that only when policy lowers unemployment can it benefit all non-capital owners (both the employed and unemployed taken as a group). Since neither EI nor a guaranteed annual income reduces unemployment, these policies are dominated by two other initiatives - a WITB (chosen by our government) and an employment subsidy for firms (recommended by Phelps) - from this point of view

- Appreciate that - with the employment subsidy to firms stimulating labour demand while the WITB stimulates labour supply – the former policy raises wages while the latter reduces wages. This difference ensures that the undesirable transfer of income within the non-capitalist group that is part of a WITB is avoided with Phelps' suggestion

- Understand the "AK" model of endogenous productivity growth based on human capital. Appreciate that there are no transitional dynamics in this model; the economy jumps to its new balanced growth path immediately following the introduction of an unanticipated new policy (or some other event such as a change in demographics, tastes or technology). Given this, the short-term pain or gain that occurs is calculated by deriving the effect of that development on the ratio of consumption to physical capital (x), while the long-term pain or gain effect is derived by calculating what happens to the growth rate (n).

- Appreciate that a further implication of the simple dynamic structure is that both positive and normative analyses can be undertaken. When the short-term and long-term effects push utility in opposite directions, it is straightforward to calculate the overall verdict concerning any policy, since the net effect on utility is a simple weighted average of the x and n outcomes.

- Assess the likely size of the effects of policy on the productivity growth rate in this class of endogenous growth models, and compare this outcome with the one-time level effects of policy initiatives that occur in exogenous productivity growth rate models.

- Understand that in a two-sector model (involving human capital produced via a linear production function with no physical capital), it is the wage-income tax that needs to be cut to raise productivity growth, not the interest-income tax.

- Appreciate that a proportional expenditure tax is preferred to a proportional income tax, in a simple model that involves no labour-leisure choice and no second-best problem. An example of a second-best situation is the misallocation of resources that stems from the government sector being "too big."

- Understand that retail sales taxes are regressive since poor households spend a higher fraction of their income than do richer households. From an administrative point of view, this unappealing equity dimension of expenditure taxes can be overcome (so that the appealing efficiency dimension can be embraced) as long as the expenditure tax is administered as an income tax with unlimited deductions of all documented acts of saving when taxable income is calculated. In this way, the expenditure tax can be made progressive. However, the formal analysis that compares a progressive expenditure tax to a progressive income tax – within a model that has two groups of households (both patient Ramsey-type forward-looking planners and others who never save and who live "hand to mouth"), does not support the move to the progressive expenditure tax (when this tax substitution is assessed according to the hypothetical compensation criterion).

- Appreciate that the anti-poverty initiative that scored the highest marks in our non-growth analysis of structural unemployment receives added support from endogenous growth theory. In this setting we find that the employer subsidy for hiring workers brings a Pareto improvement: no generation suffers losses, the unemployment rate falls and the productivity growth rate rises. This is because unemployment limits growth. With lower unemployment, physical capital has more human capital to work with and so the marginal product of physical capital (the interest rate) rises. This stimulates saving and so higher growth, yet there is no short-term pain for either rich or poor households.

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*Note: Chapters 6 and 7 re-examine some of the most central stabilization-policy questions that have pre-occupied both macroeconomists and policy-makers for decades - through the lens of the New Neoclassical Synthesis framework. Time constraints mean that we will not study this material (except for the few pages indicated in the topic outline). But we have covered enough for students to benefit from reading all of chapters 6 and 7 after the course is over - when the text can be used as a reference as students shift to working as policy analysts. It is unfortunate that we do not have time to cover this material (to exploit more fully the investment that students have made in learning the methods of analysis). Nevertheless, to emphasize that students are now in a position to receive significant returns on their investment, a few of the "punch lines" that emerge from chapters 6 and 7 are listed here:*

- *Granger causality tests are unconvincing if agents are forward-looking*
- *Disinflation and deficit-reduction initiatives involve less short-term pain when they are announced before they are executed*
- *A flexible exchange rate is a built-in stabilizer - compared to joining a currency union*
- *A revenue-neutral fiscal policy package - involving lower payroll taxes (to decrease the costs of domestic producers (exporters)) and higher sales taxes (to pay for the payroll tax cut and to increase the price of imports) can replicate the effects of a currency depreciation (which is often desired to stimulate aggregate demand but which is not available for a country (or province) within a currency union)*
- *A flexible sales-tax-rate policy can likely create inflationary expectations more effectively than can a monetary policy of forward guidance - when we are constrained by the zero lower bound on nominal interest rates*

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Senate guidelines dictate that students be reminded about the possibility that courses may have to be altered from what is described in course outlines. A similar dictate regarding a reminder about academic dishonesty is also required. Both reminders appear on the final page of this course outline:

## e-mail contact and Student Responsibility Statement

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of students to check their McMaster email and course websites weekly during the term and to note any changes. In this course, the instructor will make announcements in class and by using the course e-mail distribution list.

## Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences—e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty, please refer to the Academic Integrity Policy, located at:
http://www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty:
1) Plagiarism—e.g., the submission of work that is not one's own or for which other credit has been obtained.
2) Improper collaboration in group work.
3) Copying or using unauthorized aids in tests and examinations.