14.05 Midterm
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You have 1.15 min. There are three questions (two with math, one without). You must answer all questions. No books or notes are allowed.

Good Luck!

Question 1 (30% of the grade; you should allocate about 20min.)

Provide brief intuitive answers to the following questions.

(**i**) According to the Ramsey model, what is the impact of a "fiscal stimulus" on investment, consumption and output if the stimulus is financed with lump-sum taxes? What if it is financed with a tax on capital income?

(**ii**) Chinese households have been enjoying very fast growth in their income—a trend that is expected to continue for a while. According to consumption smoothing, would you expect China to run current-account deficits, or current-account surpluses?

(**iii**) Describe what conditional convergence means in the data? Can both the Solow and Ramsey models help us explain this feature of the data?

(**iv**) What are the main empirical and theoretical contributions of the *Mankiw, Romer and Weil*'s paper? What are the main empirical challenges they faced in their analysis?

(**v**) Does a consumer with preferences $u(c) = c - \alpha c^2$ save more as his future income becomes more uncertain?

Question 2 (40% of the grade; you should allocate about 30min.)

Consider the Ramsey model (where savings is endogenous). For simplicity, suppose there is neither any technological change nor any population growth. However, there is a government that might subsidy savings. Let $\gamma \in \mathbb{R}$ denote the subsidy.

Suppose now that the government decides to subsidizes savings, going from a zero subsidy $\gamma_{low} = 0$ to a positive subsidy $\gamma_{high} > 0$. This change is unanticipated but, once it occurs, it is expected to last for ever. Suppose further that before this change the economy was resting at the steady state corresponding to zero subsidy.

(**i**) What is the long-run impact of this change on the steady-state levels of per-hear capital (k), output (y), and consumption (c) are affected by this change?

(ii) What is the immediate impact of this change on the aforementioned variables? And how do these variables behave over time as the economy transits from the old steady state to the new steady state?

(iii) Suppose that the government contemplates the optimal level of the aforementioned subsidy. Is there a trade-off between short-run and long-run consumption? How is this trade-off resolves? What is the optimal subsidy?

Question 3 (30% of the grade; you should allocate about 20min.)

Consider the Solow growth model (where the saving rate is exogenously fixed). The production function is $y = f(k) = Ak^\alpha$ for some $\alpha \in (0, 1)$. The saving rate is $s \in (0, 1)$, the depreciation rate is $\delta = 0$, the rate of exogenous technological change is $g = 0$, and the rate of population growth is $n > 0$.

(i) Suppose that congress passes a new law on immigration that lowers the inflow of immigrants. As a result, the rate of population growth falls from n to n^{new}, where $0 < n^{new} < n$. For simplicity, suppose that this change happens instantaneously and will last for ever. Suppose further that the economy was in steady state before this change.

What is the long-run impact of the new law on the steady-state levels of per-head capital (k), income (y), the wage rate (w), and the interest rate (r)? Who benefits from the law, the workers or the capital owners?

(ii) Now suppose that, in addition to the aforementioned reduction in n, the law restricts some talented immigrants from entering the country. As a result, aggregate total factor productivity falls from A to A^{new}, where $0 < A^{new} < A$.

How does this additional change affect your answer to the previous question? (Hint: you can first abstract from the change in n, explain the implications of the change in A, and then combined the two cases intuitively.)

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