

Second Midterm KEY

Economics 201: Introduction to Macroeconomics
Winter Quarter 2017
Mark Witte
Northwestern University

The test is out of 100 points (short questions worth 4 points each, 4 graphs worth 5 or 10 points each, one essay worth 10 points) and is worth 15% of your class grade. There is no guessing penalty so answer all the questions. Please be thorough but concise. Verbose answers will not help you. You can use a calculator. Handing the exam in on time (by **11:50**) will gain you a **bonus of 4 points**. Handing the exam in **after 11:54** will **cost you five points** with the penalty rising after that.

This exam covers all readings, lectures, sections, and notes through Friday, February 10th. Reading coverage: Krugman & Wells chapters 6-12, Dasgupta chapters 3, 6, 7, Buchholz VI Marx and IX Keynes, Gordon, Gordon, Klenow.

The problems on this page refer to this table and these abbreviations. Consumption = C, Taxes = T, Investment Demand = I_D , Disposable Income = $Y-T$, Govt. Purchases of Goods and Services = G, Aggregate Expenditure = AE, the MPC is constant, Foreign trade is zero. Autonomous consumption = \$140.

AS = Y	T	Y-T	C	I_D	G	AE	$\Delta(\text{Inventories.})$
\$2,000	\$400		\$1,340	\$400	\$350		
\$2,120	\$400		\$1,430	\$400	\$350		
\$2,240	\$400			\$400	\$350		
\$2,360	\$400			\$400	\$350		
\$2,480	\$400			\$400	\$350		
\$2,600	\$400			\$400	\$350		
\$2,720	\$400			\$400	\$350		

W2017	C =	a	+ b*	d(Y-T)		250	150			
dAS	120	140	0.75							
AS=Y	T	Y-T	C	S	I_D	G	AE	ΔInv	Leak	Inj
2000	400	1600	1340	260	400	350	2090	-90	660	750
2120	400	1720	1430	290	400	350	2180	-60	690	750
2240	400	1840	1520	320	400	350	2270	-30	720	750
2360	400	1960	1610	350	400	350	2360	0	750	750

2480	400	2080	1700	380	400	350	2450	30	780	750
2600	400	2200	1790	410	400	350	2540	60	810	750
2720	400	2320	1880	440	400	350	2630	90	840	750

1. (4 points) Fill in the table.

2. (4 points) How big a rise in government spending would it take to raise equilibrium by \$240?

ANSWER: $\Delta AE = 1/(1-MPC) \cdot \Delta G$, $\$240 = 1/(1-0.75) \cdot \Delta G$, $\Delta G = \$240/4 = \60 .

3. (4 points) How much of a tax change would it take to accomplish the same change?

ANSWER: $\Delta AE = -MPC/(1-MPC) \cdot \Delta T$, $\$240 = -0.75/(1-0.75) \cdot \Delta T$, $\Delta T = \$240/(-3) = -\80 .

4. (4 points) America is winning so much! Investment demand rises by \$50 and Paul Ryan balances the budget (sets $G-T = 0$) by changing T . After all this works out, what is the new equilibrium level of production? (You'll have to do math here; the answer won't necessarily hit any of the table choice exactly. Please show enough of your work that we can understand how you got your answer.)

ANSWER: $\Delta AE = 1/(1-MPC) \cdot \Delta I_D - MPC/(1-MPC) \cdot \Delta T = 4 \cdot \$50 - 3 \cdot (-\$50) = \$200 + \$150 = \350

Put your short answers here:

2. \$60	3. -\$80	4. \$2,710
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5. (4 points) What is **equilibrium spending** in this economy? When pre-tax income is **\$2,000**, consumption is **\$1,400**.

Autonomous consumption is **\$200**. Investment demand is **\$330**. A rise in after-tax income of **\$500** raises consumption spending by **\$400**. Imports are **\$330**. Exports are **\$300**. Taxes are **\$500**. Government Spending on Goods & Services is **\$600**. Please show enough of your work that we can understand how you got your answer.

ANSWER: $AE = 200 + 0.8 \cdot (Y-500) + 330 + 600 + 300 - 330 = 700 + 0.8 \cdot Y$

In equilibrium: $AS = AE$, $Y = 700 + 0.8 \cdot Y$, $Y = 700/(1-0.8) = \$3,500$

6. (4 points) In the previous problem, what is the change in inventories when output is \$5,000? Please show enough of your work that we can understand how you got your answer. (Be careful of the sign.)

ANSWER: $AE = 700 + 0.8 \cdot \$5,000 = \$4,700$. $\Delta \text{Inventories} = AS - AE = \$5,000 - \$4,700 = \300 .

7. (4 points) Let everyone have an **MPC = 0.9** and there are no taxes. President Trump wants to drain the swamp, so has government spending of \$4,000 to do that. They hire a guy from Goldman-Sachs to do the work. The Goldman guy saves some of his income, and spends the rest to hire Hillary Clinton to give a speech. She saves some of the income and uses the rest to buy an e-mail server from Julian Assange. Julian saves a bit, and spends the rest to buy some luggage to prepare for a trip. So far, how much induced consumption has there been? Please show enough of your work that we can understand how you got your answer.

	ΔY	ΔC	ΔS
Goldman Guy	\$4,000	\$3,600	\$400
HRC	\$3,600	\$3,240	\$360
Julian Assange	\$3,240	\$2,916	\$324
		\$9,756	

Put your short answers here:

5. \$3,500	6. \$300	7. \$9,756
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8. (4 points) Compute the [Mabel Pines](#) Consumer Price Index for **2015**, using **2016 as a base year**. Please show enough of your work that we can understand how you got your answer.

	P ₂₀₁₅	Q ₂₀₁₅	P ₂₀₁₆	Q ₂₀₁₆	P ₂₀₁₇	Q ₂₀₁₇
Yarn	\$6	10	\$12	10	\$13	15
Pitt Cola	\$2	8	\$3	5	\$4	10
Smile Dip	\$3	10	\$2	4	\$2.50	0
Hog chow	\$5	2	\$10	3	\$8	4

ANSWER: PI for 2015 using 2016 as a base = $(P_{s_{2015}} * Q_{s_{2016}}) / (P_{s_{2016}} * Q_{s_{2016}}) * 100$
 $= (\$6 * 10 + \$2 * 5 + \$3 * 4 + \$5 * 3) / (\$12 * 10 + \$3 * 5 + \$2 * 4 + \$10 * 3) * 100$
 $= (\$60 + 10 + 12 + 15) / (\$120 + 15 + 8 + 30) * 100 = \$97 / \$173 * 100 = 56.1$

9. (4 points) Hamilton spoiler alert! [Alexander Hamilton](#) got involved with a woman named Maria Reynolds, and was blackmailed about this by her husband James. Hamilton paid about \$1,000 to them in 1792, when the price level was about 15. The price level is currently 240. How much was the value of Hamilton's payments in terms of today's price level? Please show enough of your work that we can understand how you got your answer.

ANSWER: (Historical dollar figure) * (Current price level / Historical price level) = \$1,000 * 240 / 15 = \$16,000

10. (4 points) Let the relevant annual interest rate be 2%. Given that, there is a bond that will pay \$500 two years from now (and nothing until then). What is the present value of that bond? How much would that present value change if interest rates were to rise to be 3%? Please show enough of your work that we can understand how you got your answer.

ANSWER: PV at 2% = $\$500 / (1.02)^2 = \480.6 . PV at 3% = $\$500 / (1.03)^2 = \471.3

Put your short answers here:

8. 56.1	9. \$16,000	10. PV = \$480.6	$\Delta PV = -\$9.3$
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11. (4 points) Which country seems to face the highest expected inflation rate?

- A. Florin: Real interest rates are 12% and nominal rates are 7%.
- B. Guilder: Real interest rates are 2% and nominal rates are 5%.
- C. Archenland: Real interest rates are 9% and nominal rates are 13%.
- D. Calormen: Real interest rates are 2% and nominal interest rates are 8%.
- E. Narnia: Real interest rates are 8% and nominal interest rates are 8%.

ANSWER: D. Expected inflation = $i - r = 8\% - 2\% = 6\%$

12. (4 points) Which of the following would shift the investment demand curve to the right?

- A. An economic boom that raises firm profits.
- B. A recession, so that the Federal Reserve reduces interest rates.
- C. An inflation so that interests rates change due to the Fisher Equation.
- D. Increased taxes.
- E. Declining capacity utilization, so that firms need to build up capacity to meet demand.

13. (4 points) Karl Marx thought that the Capitalist system would suffer temporary collapses of production because of....

- A. Attempts by firms to make the surplus value of labor too high.
- B. Attempts by capitalists to pay workers too little.
- C. Workers getting paid too well.
- D. Injections in excess of leakages.
- E. Firms breaking up into smaller units.

14. (4 points) According to Dasgupta, in Becky's world, ties are....

- A. ...worn by men in the workplace, but in Desta's world, they are worn by both men and women, but only for ceremonial occasions.
- B. ...weaker and fewer, while in Desta's world they are plentiful and strong.
- C. ...weaker and more plentiful, while in Desta's world they are strong and few.
- D. ...strong and plentiful, while in Desta's world they are weak and few.
- E. ...strong and few, while in Desta's world they are weak and plentiful.

15. (4 points) According to Dasgupta, when economists think about Climate Change, they....

- A. ...see a tradeoff between costs now and benefits in the future, largely in the distant future (50 to 100 years or more).
- B. ...rate it as one of the most pressing, often the most important problem society faces.
- C. ...discount future benefits because they know that getting them will require regulation, and that's harmful.
- D. ...discount future benefits at a low rate because they believe that future societies will be much richer than now.
- E. ...discount future benefits by a 5% interest rate (approximately), which makes those benefits much more valuable today than they will be in the future.

Put your short answers here:

11. D	12. A	13. C	14. C	15. A
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Graphs

16. (10 points) For simplicity, suppose that we don't have diminishing returns to capital. Let output per worker be given by this function: $Y/N = A*(20 + 0.75*(K/N))$

"A" stands for productivity and we'll start with $A = 2$ and $K/N = 40$, so that $Y/N = 100$.

A) How much would K/N have to change so that Y/N became 130?

ANSWER: $Y/N = A*(20 + 0.75*(K/N)) = 2*(20 + 0.75*(K/N)) = 130$. $K/N = (130/2 - 20)/0.75 = 45/0.75 = 60$.

$\Delta(K/N) = 20$

This moves us along the Y/N as a function of K/N line.

B) How much would productivity have to change so that Y/N became 130?

ANSWER: $130 = A*(20 + 0.75*K/N) = A*(20 + 0.75*40) = A*(20 + 30)$, $A = 130/50 = 2.6$ $\Delta A = 0.6$

This shifts up the Y/N as a function of K/N line.

C) If this were the real world and a country had the choice of (A) or (B) happening, which would it prefer to have happen and why?

ANSWER: It would be better for the country if (B) happened because it's costly to build up a lot of capital per worker, particularly if there are diminishing returns to capital.

17. (5 points) On a well-labeled graph of Real Output versus Aggregate Expenditure (a 45° diagram), show an economy that is producing 800 but with inventories rising. Label that point A. Using an arrow, show how you would expect output to change over time. Label this point B.

ANSWER: We start with a level of production (A) at 800, but move down the AE curve until we reach $Y < 800$ (B) where

$$AE = Y.$$

18. **(5 points)** Let the economy in the previous problem now be at equilibrium at an output of 800 (label this B). Suppose that full employment would occur at output of 1,000. How could changing interest rates accomplish this? Explain briefly and show how this would work on the graph, and label the new equilibrium C. Label your graph carefully.

ANSWER: We would lower interest rates, thereby increasing Investment Demand, raising the AE line until equilibrium rises to $Y = 1,000$.

19. **(10 points)** On an LRAS-SRAS-AD graph, suppose that investment demand declined, but inflation increased and the rise in unemployment was much bigger than expected. Graph how this could have happened.

ANSWER: AD moves left, but SRAS moves left even more.

20. **(10 points)** Who does Gordon think better describes what's coming in the future, Kuznets or Piketty? Why does this matter for Gordon's work?

ANSWER: Gordon shares Piketty's view that inequality is likely to remain high, or even rise. Thus, Gordon worries that future growth will likely be low, and what growth there is will largely go to the very wealthy, meaning that few benefits of the remaining low growth will reach average citizens.