Name _____ _____ last 4 PSU ID _____

Section 001 - MWF 11:15 am - 12:05 pm : 10 Sparks Building
Section 002 - MWF 2:30 – 3:20 pm : 102 Thomas Building

Spring 2013 Chuderewicz

YOU MUST USE THIS AS A TEMPLATE – THAT IS – **MAKE SPACE FOR YOUR ANSWERS BY HITTING ENTER** (you certainly don't need to type this assignment)– LEAVE THE QUESTIONS AS THEY ARE – AND **PLEASE STAPLE**! NOTEBOOK **PAPER** (OR ANY PAPER) **STAPLED TO THE BACK IS NOT ACCEPTABLE**. ALSO, PLEASE **PUT THE FIRST TWO LETTERS OF YOUR LAST NAME IN THE TOP RIGHT HAND CORNER** OF THIS PAGE SO THAT WE CAN ALPHABETIZE THESE EASILY. THANKS IN ADVANCE!

Economics 304

Homework #4 – Desired Capital, Investment, and Goods Market Equilibrium

Due Wednesday, 2/13 at the beginning of class – you must hand in homework in the section you are registered in - no late papers accepted!

Instructions: Please show all work or points will be taken off. Good luck!

1. PART 1 (35 points total – 5 points for each part and 10 points for the diagram) You own a golf course in Florida and you need to determine how many golf carts you need to buy to maximize profits. Please answer the following questions given the information below.

A brand new golf cart costs 600 rounds of golf and the rate of depreciation is 16% (.16).

The real interest rate is 4% (use .04 in calculations).

The expected marginal product of capital is given by $MPK' = 500 - 5K$.

a) What is the user cost of capital and what is it expressed in??

b) How many golf carts should you buy to maximize profits (i.e., what is K*)?

Draw a graph (the uc / MPK graph) depicting the state of affairs and label this initial profit maximizing point as **point A**.

A completely labeled and correct graph is worth 10 points.

c) Now suppose the (local) government with all their financial shortfalls embarks on a campaign to raise revenue to fund the fire department by imposing a so-called "luxury tax" (we know it as τ) equal to 20% of gross revenue What happens to the profit maximizing number of golf carts? Please show all work and label as **point B** on your uc/MPK graph.

d) Now explain why your profit maximizing K* has changed. Please be specific using **the firm's profit maximizing condition (explain the intuition!)**. Start your answer with *"If I did not change my capital input (my K*), then I would not be* …….(you can finish the rest!) ……."

e) The Federal government, knowing all about the financial pains encountered by state and local governments given the Great Recession, decide to offer an investment tax credit equal to 30% (this is in addition to the tax already imposed by the local government). What is your desired capital stock (K*) now? (Hint: An investment tax credit effectively reduces the price of capital to the firm – think of it as this – under the investment tax credit – you buy a golf cart (cost = 600 rounds of golf) and you get a 30% rebate from Uncle Sam so the investment tax credit adjusted price of the golf cart is now 420 rounds of golf [(1-.30) x 600 = 420]. **Please show all work again** and label this as point C on your uc/MPK diagram.

1. PART 2 (NEW GRADER – 35 points – 5 for f) and g) 10 for h) and 15 for graph)) Draw a desired investment diagram (completely labeled with all the shift variables noted next to the function in parentheses with signs (+ or -)) depicting the **initial** equilibrium as point A (simply draw a negatively sloped I^D curve going through point A). Label the initial real interest rate as r^*_A = .04 (as is given above) and the initial level of desired investment as I^d_A. Note importantly that we do not have numbers for desired investment, but that's ok, we are focusing on the change in desired investment, given the same real rate = .04. Be sure to include **all of** the shift variables in parentheses next to this initial I^D function.

A completely labeled and correct graph is worth 15 points.

Then show, as point B, the new level of desired investment, at the same real rate = .04.

f) Why did the level of desired investment change, even though the real rate of interest did not? Please be specific using the equation that connects the desired capital stock (K*) to desired investment (as we did in class (equation 4.6…in text).

Label this (new) level of desired investment as I^d_B (again, we don't have specific numbers for I^d_B. Be sure to include **all of** the shift variables in parentheses next to your new I^D function

Finally, show how the investment tax credit maps to your desired investment diagram and label this final point as point C. Label this (new) level of desired investment as I^d_C (again, we don't have specific numbers for I^d_C). Make sure you include **all of** shift variables in parentheses next to your new I^D function.

g) Suppose that the Federal Reserve had a goal to get the capital stock (the number of golf carts purchased) back to its initial level as in part b (this would keep the economy from overheating). Given all the changes (the imposition of the tax by the local government and the investment tax credit offered by the Federal Government), what would they have to do to the real rate of interest to achieve their objective? Please show all work and I am looking for a specific number (i.e., r = ?).

h) (10 points) Finally, explain how this most previous development (a change in r) would influence your two diagrams and why. Don't show on your **TWO** diagrams, I am asking for a discussion (this question is worth ten points!)

2. **(45 points total – 5 points each part except part e)** A closed economy has full employment level of output (Y) of 2,000. Government purchases, *G*, are 200, taxes (T) are 400. Desired consumption (C^d) and investment (I^d) are:

$C^d = 500 + 0.5(Y - T) - 600r$
$I^d = 600 - 400r$

a) Solve for the desired savings function in intercept - slope form (note, the intercept is an integer).

b) Now solve for the goods market clearing interest rate. Please show all work.
Draw a desired savings/investment diagram locating this initial equilibrium and point A.

A correct and completely labeled diagram is worth 10 points

We now have a change in the desired investment function – it is now:

$I^d = 650 - 400r$

c) Name four reasons why the desired investment function would change the way did.

d) Resolve for the goods market clearing interest rate and the associated levels of desired savings and investment.

Add this development to your diagram and label as point B.

e) (10 points – discussion = 5 and correct and completely labeled diagram = 5) Choose one and only one of the reasons from part c and show the movement from point A to point B using a user cost – MPK^s diagram. Please be clear on which of the 4 reasons from c) you are using.

f) What has happened to the level of desired consumption and why? Be sure to refer to the substitution effect in your answer!