HE1002
Macroeconomics 1

Group 4 - ***Savings and Capital formation***

Members : Eason, Janelle, Maverick, Shaunak

Question 1

Qns 1

Corey has a mountain bike worth $300, credit card debt of $150, $200 in cash, a Sandy Koufax baseball card worth $400, $1,200 in a checking account, and an electric bill due for $250.

a) Construct Corey's balance sheet and calculate his net worth.

Assets	$	Liabilities	$
Mountain Bike	300	Credit card debt	150
Cash	200	Electric bill due	250
Baseball Card	400		
Checking a/c balance	1,200		
Total	2,100	Total	400

Corey's net worth-
Assets - Liabilities
$2,100 - $400 = $1,700

Qns 1

For each remaining part, explain how the event affects Corey's **assets, liabilities, and wealth.** Which of the events, if any, correspond(s) to saving on Corey's part?

b) Corey goes to a baseball card convention and finds out that his baseball card is a worthless forgery.
Assets = $2,100 - $400 = $1,700
Liability = $400
Wealth/ net worth = $1,700 - $400 = $1,300 (Capital loss of $400)

c) Corey uses $150 from his paycheck to pay off his credit card balance. The remainder of his earnings is spent.
Assets = Unchanged
Liability = $400 - $150 = $250
Wealth/ net worth = $1,700 + $150 = $1,850
This corresponds to savings since he uses his income - savings decreases.
Savings = Current income - current expenses

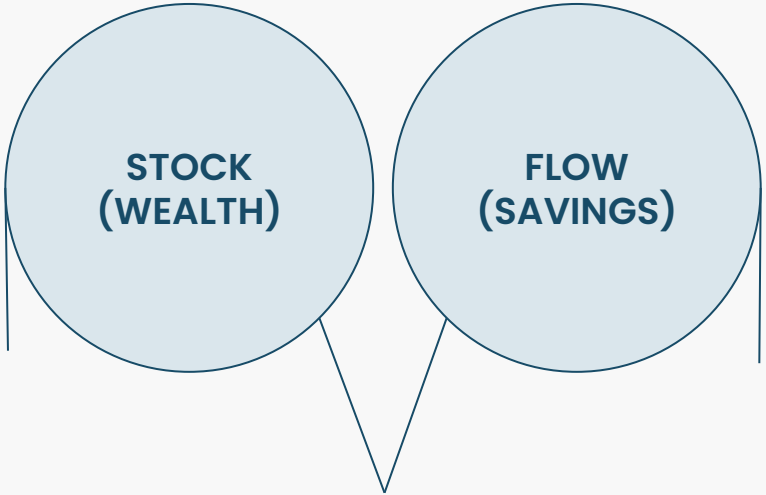
Qns 1

For each remaining part, explain how the event affects Corey's assets, liabilities, and wealth. Which of the events, if any, correspond(s) to saving on Corey's part?

d) Corey writes a $150 check on his checking account to pay off his credit card balance.
Assets = $2,100 - $150 = $1,950
Liability = $400 - $150 = $250
Wealth/ net worth = $1,950 - $250 = $1,700 - Unchanged, since the assets and liabilities decrease by the same amount

Question 2

UNDERSTANDING THE DIFFERENCE BETWEEN A STOCK AND A FLOW



A measure that is defined **at a point** in time

It is also known as an entity that can be accumulated or be depleted. For instance, a bathtub can accumulate water.

A flow is the rate of change of stock

A measure that is defined **per unit** of time

It is also known as an entity that makes stocks increase or decrease. For instance, water flowing into bathtub.

Qns 2

State whether each of the following is a stock or a flow, and explain

1. The gross domestic product

(a) GDP is the market value of all finished goods and services produced within a country in **a given period of time**

(i) A given period of time - per quarter or per year - so it has a range of time

(ii) Hence, the GDP is a flow concept

2. The value of the U.S. housing stock **on January 1, 2020**

(a) On January 1, 2020 indicates a specific time

(i) It is defined at a point in time and this case, it is on January 1, 2020.

(ii) Hence, it is a stock concept

Qns 2

State whether each of the following is a stock or a flw, and explain

3. The amount of U.S. currency in circulation **as of this morning**

(a) As of this morning, it also indicates a specific time

(i) It is defined at a point in time and this case, as of this morning. It can be from last night to this morning or from long ago till this morning, there is no range.

(ii) Hence, it is a stock concept

4. The government budget deficit

(a) Government budget is measured over **a period of time**

(i) It is a flow concept

5. The quantity of outstanding government debt **on January 1, 2020**

(a) Date has been specified

(i) It is a stock concept

Question 3

Qns 3

Ellie and Vince are a married couple, both with college degrees and jobs. How would you expect each of the following events to affect the amount they save each month? Explain your answers in terms of the basic motivation of savings.

a) Ellie learns she is pregnant.
b) Vince reads in the paper about possible layoffs in his industry.
c) Vince had hoped that his parents would lend financial assistance towards the couple's planned purchase of a house, but he learns that they can't afford it.
d) A boom in the stock market greatly increase the value of the couple's retirement funds.
e) Vince and Ellie agrees that they would like to leave a substantial amount to local charities in their wills.

Qns 3

a) Ellie learns she is pregnant.

It will increase savings as part of **life-cycle saving**. This saving occurs in order to meet the long term objective and cost of raising a child.

b) Vince reads in the paper about possible layoffs in his industry.

It will likely increase savings as part of **precautionary saving**. If Vince fears that he will be laid off, he will save money as part of protecting himself against the potential setback of being laid off.

c) Vince had hoped that his parents would lend financial assistance towards the couple's planned purchase of a house, but he learns that they can't afford it.

It will increase savings as part of **life-cycle savings**. This saving occurs in order to meet the long term objective of buying a house.

Qns 3

d) A boom in the stock market greatly increase the value of the couple's retirement funds.

It will likely decrease savings. Assuming the couples are target savers to meet the specific goal of retirement, they can save less and still be able to reach their goals because the funds they have put aside will grow more quickly.

e) Vince and Ellie agrees that they would like to leave a substantial amount to local charities in their wills.

It will likely increase savings as part of **bequest saving**. This saving occurs in order to meet the objectives of leaving an inheritance for local charities.

Question 4

Qns 4

Individual retirement account, or IRAs, were established by the U.S. government to encourage saving. An individual who deposits part of current earnings in an IRA does not have to pay income taxes on the earnings deposited, nor are any income taxes charged on the interest earned by the funds in the IRA. However, when the funds are withdrawn from the IRA, the full amount withdrawn is treated as income and is taxed at the individual's current income tax rate. In contrast, an individual depositing in a non-IRA account has to pay income taxes on the funds deposited and on interest earned in each year but does not have to pay taxes on withdrawals from the account. Another feature of IRAs that is different from a standard saving account is that funds deposited in an IRA cannot be withdrawn prior to retirement, except upon payment of a substantial penalty.

4a)

Sarah, who is five years from retirement, receives a $10,000 bonus at work. She is trying to decide whether to save this extra income in an IRA account or in a regular savings account. Both accounts earn 5 percent nominal interest, and Sarah is in the 30 percent tax bracket in every year (including her retirement year). Compare the amounts that Sarah will have in five years under each of the two saving strategies, net of all taxes. Is the IRA a good deal for Sarah

Firstly, We have to consider the tax implications due to the different amount of taxes being charged when comparing the net amount of saving in the the savings account and IRA account.

If sarah saves $10,000 in an IRA account, she will not have to pay income taxes on the earnings deposited.

- There will also be no income taxes charged on interest earned until she withdraws them after retirement.
- She will continue to earn 5% nominal interest rate and it will continue to grow from $10000 at the full value

4a)

However,
If sarah saves the $10,000 in a regular savings account, she has to pay income taxes on the funds deposited and on interest earned in each year.

- Since Sarah's income puts her under the 30% tax bracket, only $7000 (70/100 x $10,000) will be invested initially.
- Furthermore, the interested earned each year on this amount will also be subjected to taxes that she has to pay each year.

Calculating the net values after five years:

IRA Account:
Principal amount invested: $10,000
Annual Interest Rate: 5%
Tax Rate: 30% (after 5 years).
Net value after 5 years: 10000(1.05)^5=$12,762
Net value after tax: 12762(0.7)= $8933 (rounded)

Regular Savings Account:
Principal Amount invested: $7000
Annual Interest Rate: 5%
Taxes: 30% (taxes paid on interested each year)
Net value after 5 years: 7000(1.035)^5= $8313.80

As seen from the calculations shown above, Sarah will be better off if she invests in IRA account as it will provide a higher net value after 5 years.

4b)

Would you expect the availability of IRAs to increase the amount that households save? Discuss in light of (1) the response of saving to changes in the real interest rate and (2) psychological theories of saving.Re

Yes, the availability of IRAs would be expected to increase the amount that households save because...

1. Response to changes in the real interest rate: when real interest rates are high, individuals are more motivated to save and earn a return on their savings. By offering tax advantages and potentially higher returns, IRAs incentivize individuals to save more, even when interest rates are relatively low.

2. Psychological theories of saving: with the availability of IRAs, households would be more inclined to save because usually consumer struggle with self control but because their money is kept inside the IRA account they cannot withdraw as there will be taxes charged on the amount withdrawn and hence it increases savings.

Overall, the availability of IRAs provide financial incentives and psychological encouragement for individuals to save more, leading to an increase in the amount of household savings.

Question 5

Qns 5a)

In each part that follows, use the economic data given to find national savings, private saving, public saving and the national saving rate.

Household Saving	$200
Business Saving	$400
Government Purchase of Goods & Services	$260
Government Transfers & Interest Payment	$135
Tax Collections	$245
GDP	$3000

Private Savings = Household Saving + Business Saving
= $200 + $400 **= $600**

Public Savings = Tax - Transfer & Interest Payment - Government Expenditure
= $245 - $135 - $260 **= -$150**

National Savings = Private Saving + Public Saving
= $600 - $150 **= $450**

National Savings Rate = 450/3000 x 100 **= 15%**

Qns 5b)

In each part that follows, use the economic data given to find national savings, private saving, public saving and the national saving rate.

GDP	$6400
Tax Collection	$1925
Government Transfers & Interest Payment	$400
Consumption Expenditures	$4570
Government budget surplus	$100

Private Savings = Y - T - C
= $6400 - ($1925 - $400) - $4570 **= $305**

Public Savings **= $100**

National Savings = Private Saving + Public Saving
= $305 + $100 **= $405**

National Savings Rate = 405/6400 x 100 **= 6.32%**

Qns 5c)

In each part that follows, use the economic data given to find national savings, private saving, public saving and the national saving rate.

Consumption Expenditures	$4800
Investment	$1000
Net Exports	$16
Government Purchases	$1000
Tax Collections	$1700
Government Transfers & Interest Payment	$500

GDP = C + I + G + NX
= $4800 + $1000 + $1000 + $16 = $6816

Private Savings = Y - T - C
= $6816 - ($1700 - $500) - $4800 **= $816**

Public Savings = T - G
= $1700 - $500 - $1000 **= $200**

National Savings = Private Saving + Public Saving
= $816 + $200 **= $1016**

National Savings Rate = 1016/6816 x 100 **= 14.9%**

Question 6

Qns 6

The builder of a new movie theater complex is trying to decide how many screens she wants. Below are her estimates of the number of patrons the complex will attract each year, depending on the number of screens available.

Number of screens	Total patrons
1	40,000
2	75,000
3	105,000
4	130,000
5	150,000

After paying the movie distributors and meeting all other noninterest expenses, the owner expects to net $2.00 per ticket sold. Construction costs are $1,000,000 per screen.

Qns 6

a) Make a table showing the value of marginal product for each screen from the first through the fifth. What property is illustrated by the behavior of marginal products?

No. of screens	Total Patrons	Revenue ($)	Marginal Product	Value of Marginal product ($)
1	40,000	80,000	40,000	80,000
2	75,000	150,000	35,000	70,000
3	105,000	210,000	30,000	60,000
4	130,000	260,000	25,000	50,000
5	150,000	300,000	20,000	40,000

The marginal product declines as the screens are added, illustrating **diminishing returns to capital**.

Qns 6

Assuming that the screens do not lose value over time (e.g. they can be resold at the construction costs), how many screens will be built if the real interest rate is:

b) 5.5 percent-
The interest cost of each screen is (5.5%)*($1,000,000) = $55,000
Since there are no other costs mentioned, the ideal number of screens to be built should be 3, because the value of marginal product for 3 screens ($60,000) exceed $55,000. However, that's not the case for 4 screens ($50,000)

c) 7.5 percent-
The interest cost of each screen is (7.5%)*($1,000,000) = $75,000
Since there are no other costs mentioned, the ideal number of screens to be built should be 1, because the value of marginal product for 1 screens ($80,000) exceed $75,000. However, that's not the case for 2 screens ($70,000)

Qns 6

Assuming that the screens do not lose value over time (e.g. they can be resold at the construction costs), how many screens will be built if the real interest rate is:

d) 10 percent-
The interest cost of each screen is (10%)*($1,000,000) = $100,000
Since there are no other costs mentioned, the ideal number of screens to be built should be 0, because for none of the screens, does the value of marginal product exceed $100,000

Qns 6

e) If the real interest rate is 5.5 percent, how far would construction costs have to fall before the builder would be willing to build a five-screen complex?

The value of marginal product for the fifth screen is $40,000. Therefore, at this interest rate, it is only profitable if 5.5% times the per-screen construction cost is no greater than $40,000.

We can find the costs as follows -

Cost per screen*0.055 = $40,000
Cost per screen = $40,000/0.055 = $727,273

Therefore, construction costs have to be less than $727,273 per screen or less in order to make a 5 screen complex profitable.

Question 7

Qns 7

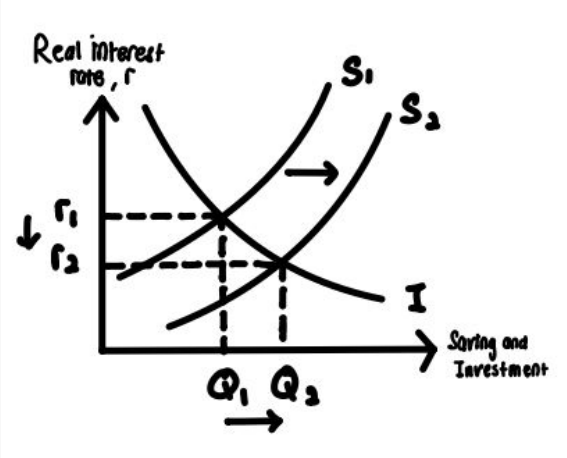
For each of the following scenarios, use supply and demand analysis to predict the resulting changes in the real interest rate, national saving, and investment. Show all your diagrams.

a) A reduction in military spending moves from the government's budget from deficit into surplus

i) Increase in public saving raises national saving.

ii) So the supply of saving (S) curve shift to right. The real interest rate falls as national saving and investment rises.

iii) National saving (Increases)
= Private Saving + Public Saving (Increases)
= [Y - T - C] + [T - G (Decreases)]

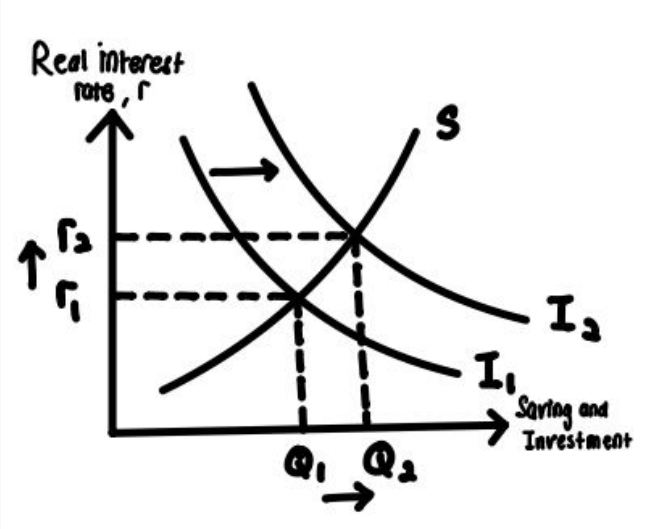


Qns 7

For each of the following scenarios, use supply and demand analysis to predict the resulting changes in the real interest rate, national saving, and investment. Show all your diagrams.

A new generation of computer-controlled machines becomes available. These machines produce manufactured goods much more quickly and with fewer defects.

a) As there is technological breakthrough, the value of marginal product of such capital increases.
b) Productivity and efficiency leads to an increase in businesses which raises the demand for investment, shifting the demand of saving (I) curve to the right
c) Hence, the equilibrium real interest rate increases as well as the saving and investment.

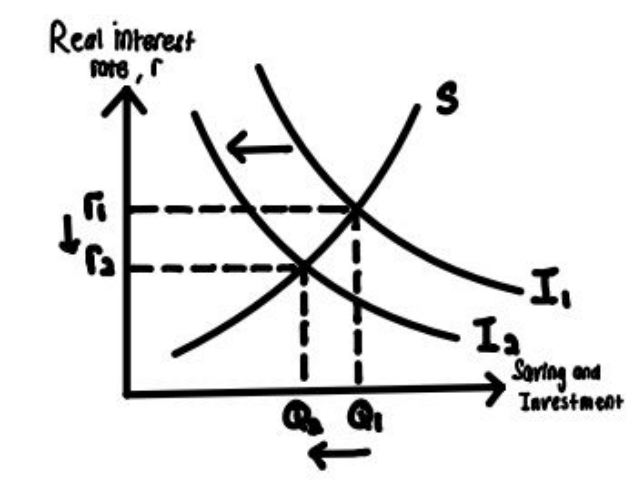


Qns 7

For each of the following scenarios, use supply and demand analysis to predict the resulting changes in the real interest rate, national saving, and investment. Show all your diagrams.

The government raises its tax on corporate profits. Other tax changes are also made, such that the government's deficit remains unchanged

a) Increase in corporate tax reduces the after-tax return.
b) Firms will now be less willing to invest, so the demand for saving (investment) shift to the left
c) The real interest rate, national saving and investment decreases.

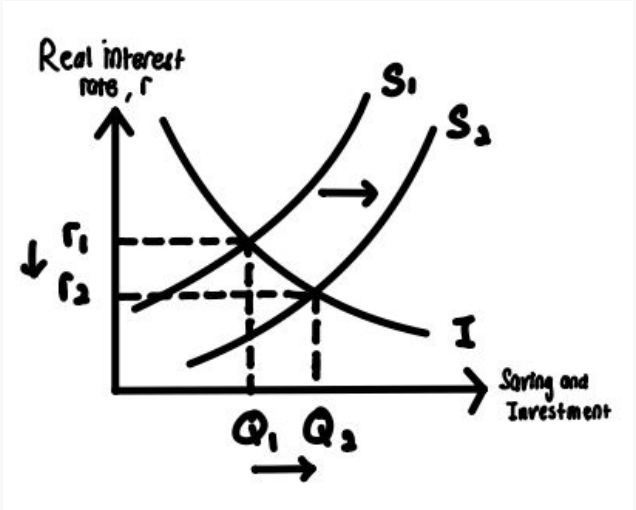


Qns 7

For each of the following scenarios, use supply and demand analysis to predict the resulting changes in the real interest rate, national saving, and investment. Show all your diagrams.

Concerns about job security raise precautionary saving

a) As precautionary saving increases, the national saving increases.
b) Hence, the supply of saving shift to the right.
c) The real interest rate falls, national saving and investment rise.

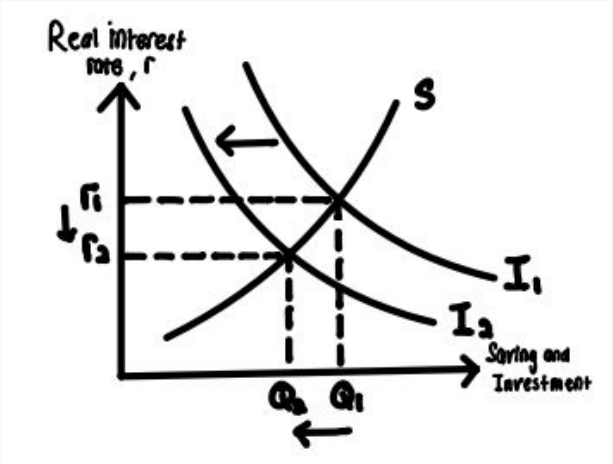


Qns 7

For each of the following scenarios, use supply and demand analysis to predict the resulting changes in the real interest rate, national saving, and investment. Show all your diagrams.

New environmental regulations increase firms' costs of operating capital

a) Increasing cost of capital will decrease firm's willingness to invest
b) So, the demand for saving (investment) decreases
c) The real interest rate, national saving, and investment falls as the demand for saving shift to the left.



Thanks!