Problem set_4 Solution:

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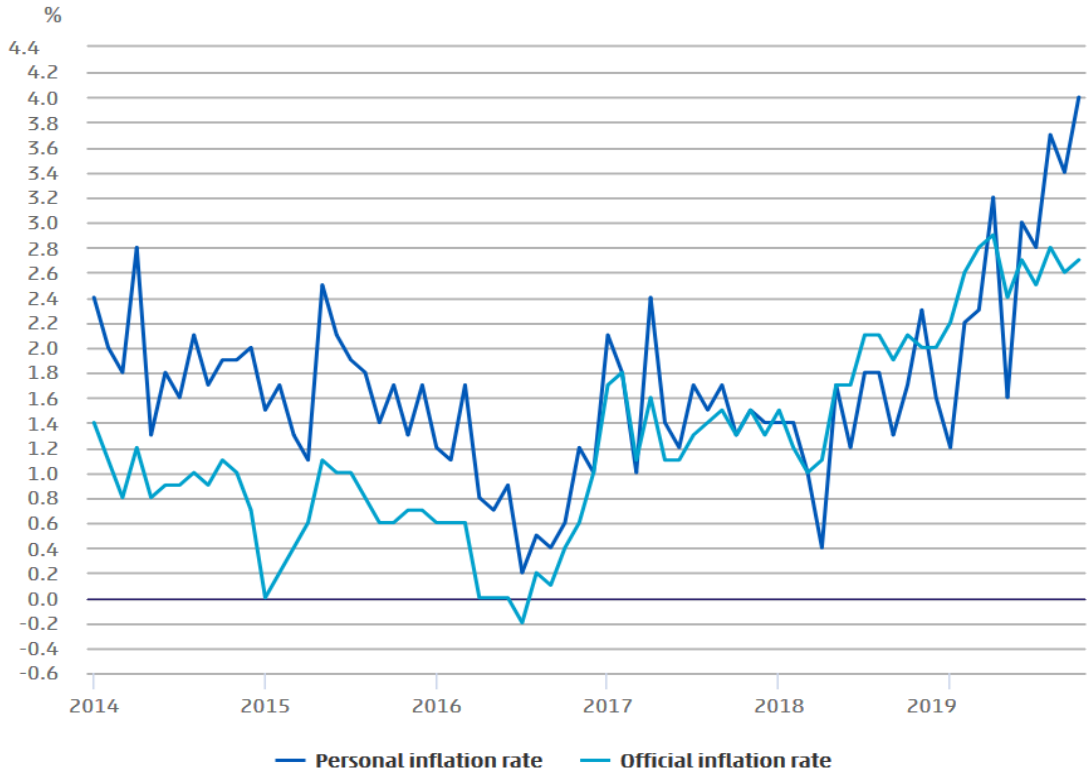
Question 1:

a) We use Consumer Price Index (CPI), which is based on thousands of goods and services that are bought by consumers in one country, and it is a weighted average of different items (considering how major they are).

b)

$$Inflation\ Rate = \frac{p_2 - p_1}{p_1} * 100 \Rightarrow 2.5 = \frac{p_2 - 100}{100} * 100 \Longrightarrow p_2 = 102.5$$

c)

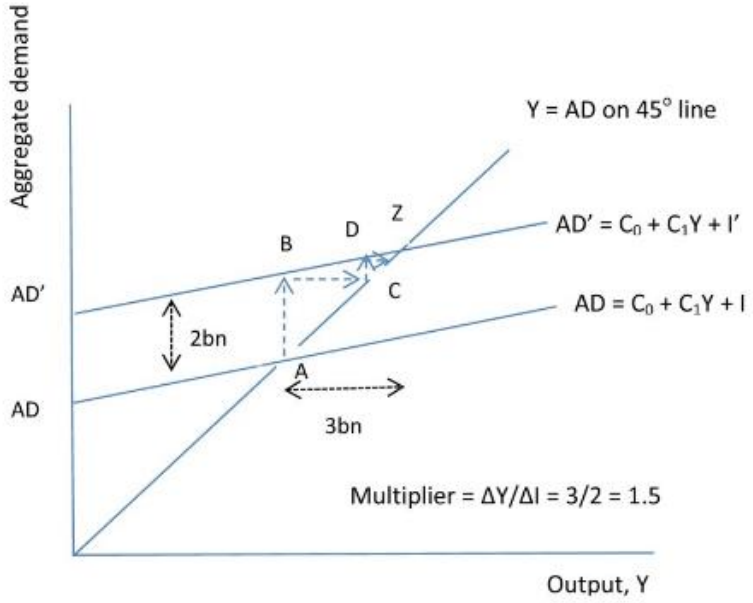


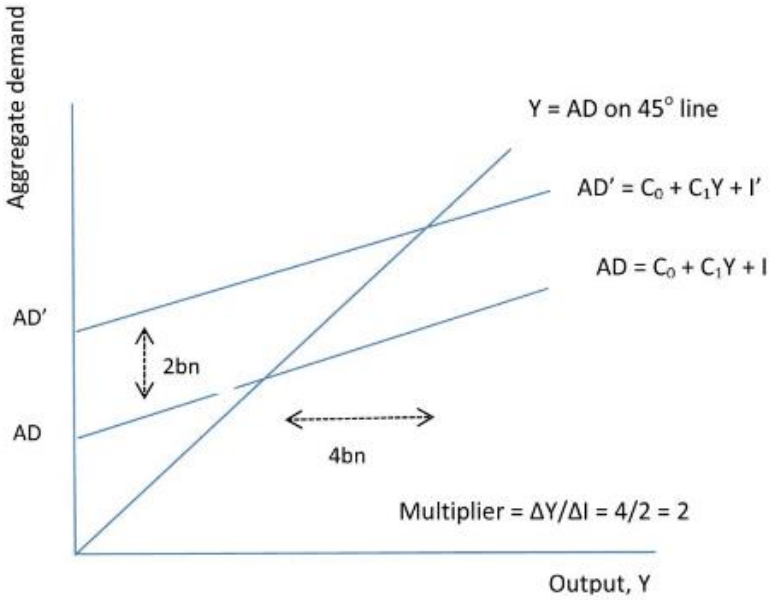
The main reason for the difference is that the items is my basket of consumption goods are different from the main one (CPI) that the government considers to calculate the inflation rate.

Question 2.

a)

The consumption line will be steeper (and the multiplier larger) in the economy with the greater proportion of credit-constrained households (whose consumption largely varies with income, compared to households with credit access).





In the first case, we assume that the investment spending will be increased by 2 billion dollars. At first the economy will go to point B, then the consumers will increase their consumptions so the output will expand to C. after a long time we will end up at the point Z. According to the definition, the multiplier is equal to $\frac{\Delta Y}{\Delta I} = 1.5$

In the second case, with the same analysis we conclude that the multiplier is equal to $\frac{\Delta Y}{\Delta I} = \frac{4}{2} = 2$, which is greater than the one before.

After all, we can conclude that in the economy with the higher share of the credit constraint households the multiplier is greater.

b) In a recession, banks are more reluctant to provide loans. Households are thus more credit constrained and the multiplier is larger. On the other hand, in a boom banks tend to be more relaxed with lending, credit constraints are less severe, so the multiplier is smaller.

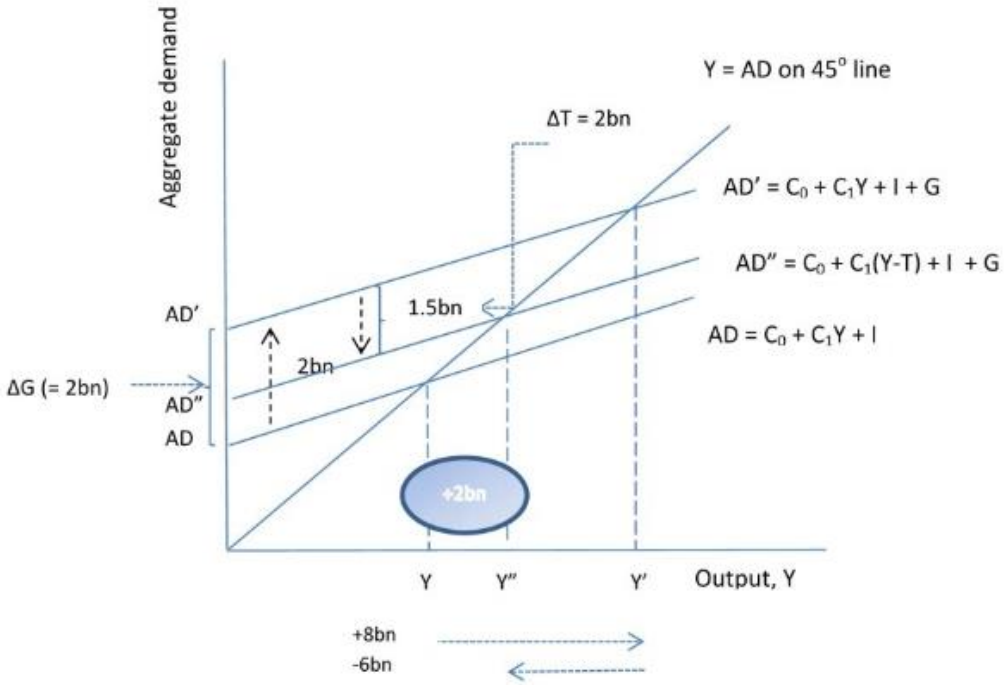
c) According to chapter 14: $k = (\frac{1}{1-c_1(1-t)+m})$

At the beginning of the Great Depression, government spending and taxation was much smaller as a fraction of GDP than it is now. This would give rise to a larger multiplier. Recall that marginal propensity to consume (MPC = C_1) decreases with income; the relatively rich consume a smaller fraction of their income than the relatively poor, because they are willing to save a larger share of their income. Let's assume that unemployment benefits are a source of income. Hence, in an economy where a large share of unemployed workforce has no savings and few assets, C_1 will be relatively larger without unemployment benefits. On the other hand, ceteris paribus, C_1 will be relatively smaller with the benefits. Therefore, in this type of economy, no unemployment benefits imply relatively larger C_1, thus a relatively larger multiplier.

A small share of imports implies that most consumption expenditure is used on domestic goods. This increases the multiplier, because demand for domestic products and services decreased by relatively less than in a more open economy (where consumers could substitute to imported goods). In the formula, lower levels of m increase the multiplier effect.
It is useful to think of the tax rate, t, and the propensity to import, m, as 'leakages' from the circular flow of income. Remember: the larger the leakages, the smaller the multiplier and vice versa.

Question 3:

a)



b)

We assume that the MPC (C_1) is 0.75 giving a multiplier value of 4. An increase of government spending of 2bn increases output by 8bn from Y to Y'. A tax increase of 2bn means an initial reduction

of spending of 1.5bn. The negative multiplier effect (4 x 1.5) reduces output from Y' to Y". The net multiplier effect of 1 is shown by Y"-Y'.

The key to the balanced budget multiplier lies in the fact that the multiplier applies to the initial change in spending and that consumption takes place out of disposable income. Hence, a tax rise (or cut) triggers the multiplier because it causes a change in spending in the form of consumption, But since consumption takes place out of disposable income, only a fraction of the tax change is converted into an initial change in spending. In the example above, we see that the balanced budget effect is the net outcome of two changes. The first is the increase in government spending of 2bn, the whole of which is subject to the multiplier (we have assumed this is equal to 4, MPC = 0.75); the second is the decrease in consumer spending caused by the tax increase. Note that this increase is the same as the increase in government spending (so the budget remains unchanged) but only a fraction of it (determined by the MPC) is translated into a reduction in spending. In our example, government spending increases by 2bn but this is only partially offset by a reduction in consumer spending of 1.5bn (= 0.75 x 2bn). Hence there is a net increase in output of 2bn –the size of the original fiscal stimulus.

c)

Suppose the government increases expenditure and taxes by a constant: $\Delta T = \Delta G = a$

Output before change: $Y_1 = c_0 + c_1(Y - T) + I(r) + G = \frac{1}{1-c_1}(c_0 + I(r) + G - c_1 T)$

Output after change: $Y_2 = \frac{1}{1-c_1}(c_0 + I(r) + (G + a) - c_1(T + a))$

$$\Delta Y = Y_2 - Y_1 = a$$

$$so\ \Delta Y = \Delta G = \Delta T$$

and the balanced budget multiplier is thus:

$$\frac{\Delta Y}{\Delta G} = \frac{\Delta Y}{\Delta T} = 1$$

d)

The multiplier may be less than one, because people can cut consumption based on psychological effects of the tax increase. It could also be greater than one if higher-income people cut their consumption by relatively less than lower-income people. In certain circumstances, it might be impossible for the government to borrow.
Lastly, there are political issues related to changes in taxation: the political climate may not permit government to increase taxation, because most of the benefits of this plan would go to the minority of the unemployed, while the extra taxes would however be paid by the majority in employment. There might also be political objections that the actual expenditures benefit one group rather than another

Question 4.

If the countries are big trading partners (such as France and Germany in the example in the lecture notes), then the payoff matrix may look like the one shown below.

		South	
		Stimulus	No Stimulus
North	Stimulus	50,50	-5,20
	No Stimulus	20, -5	30,30

The best outcome (socially-optimal Nash Equilibrium) is to stimulate both North's and South's economies. This will boost consumption on private and imported goods and thus help both blocs.
The other Nash Equilibrium (Pareto inefficient) is for none of the blocs to stimulate the economy. This is a standard result in Coordination Games and arises because the players' actions are interdependent.
The other two choices are that only one bloc increases government spending. In the framework of our game below, these are not Nash Equilibria. Such policies would be inefficient, lead to free-riding and would result in a similar disaster as Mitterrand’s policy.
It is precisely the threat of free-riding that discourages countries from stimulating their economies, even though the best outcome for the players is to coordinate and jointly provide stimulus.