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| **Exercises from old exams to chapters in B & W with solutions.** |

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| **Chapter 6 and 8** |

**Exercise 1**

Consider a representative consumer’s choice on when to consume (today or tomorrow) for a given endowment.

1. Define the representative consumer’s indifference curves.

Answer: Along an indifference curve, utility (or well-being) is constant. It shows how readily a consumer is willing to substitute consumption today for consumption tomorrow.

1. Explain by using words and a diagram a representative consumer’s optimal consumption. Define assumptions you make.

Answer: Optimal consumption where the slope of an indifference curve (MRIC) is equal to the slope of a budget line (1+r) where r = interest rate.

1. Use indifference curves and budget lines of a typical consumer to explain what can happen if the interest rate decreases. Define assumptions you make.

**Answer:**

If decreasing interest rate. The result depends on what kind of situation the consumer was in before the interest rate fell (borrower or lender). A borrower will tend to consume more today because the interest rate at which resources are brought forward has decreased.

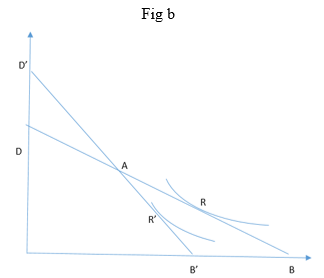
**Exercise 2**

1. Explain the household’s intertemporal budget constraint and define indifference curves in a two period’s model (consumption today and consumption tomorrow).
2. Use the model from a) to discuss countries instead of households. Suppose a country has chosen a solution along the budget line, but not optimal. Explain by using the model why this is not optimal.
3. As a follow up to b): can you name countries in such a situation and give examples of reasons why they have chosen a not optimal solution.
4. Explain the quotation: “Tax smoothing is the natural counterpart to consumption smoothing of households”.

**Answer:**

1. The budget line represents all possibilities of consumption today or tomorrow. The slope is given by the real interest rate. Along the line there will be a point called the Autarky point: This is the point when a household or a country does not trade and consume its endowment. If the real interest rate change, the budget line will rotate about its endowment point. Along any indifference curve, utility is constant. The slope of a indifference curve is called the marginal rate of intertemporal substitution (MRIS) and shows how many units of goods tomorrow we are willing to give up for an additional unit of goods today.
2. The optimal point is where the slope of an indifference curve = the slope of the budget line (MRIS equals the real interest rate). Then at points to the left along the budget line, MRIS will be higher (absolute value) than the real interest rate. This is countries that decided to consume little today (save a lot today) for more back tomorrow. We explain why it is not optimal by comparing the two slopes. If MRIS > real interest rate, then the value of last unit consumption today is perceived to be more worth than what they get back from saving tomorrow. In other words, households could increase their wellbeing if they consumed more today (saved less today).
3. A way to place a country could be to look at their current accounts. Then we find countries like Norway and China with a surplus and USA with a deficit. B & W look into the example of China in box 8.3 (Why China Defies the Permanent Income Hypothesis). Using the model, this would be like point M in fig 8.2 (little consumption today compared with tomorrow). Reasons could be an under developed banking system, no system of social security and state owned firm. In Norway the reason could be that the government save because they expect an aging population in the future.
4. Consumption smoothing: Optimal choice by households to smooth out the impact of temporary disturbances to income on consumption plans by either borrowing or saving. Tax smoothing: The proposition that a government should not change tax rates in response to temporary causes of budget deficits but should borrow instead.

**Exercise 3**

The diagram (fig b) represents the household’s intertemporal budget constraint in a two period’s model.

1. Name the axes and define the line going from D to B.

1. Define point A.
2. Explain point R.
3. Explain the change of the slope of the line from DB to D’B’.
4. Explain the change from point R to point R’.
5. Suppose a household has chosen a point along line DB but not point R. Explain by using the diagram why this is not optimal.
6. If you use the diagram to discuss countries instead of households. How can you place countries at points along the line DB?

**Answer:**

1. Horizontal axis consumption today and vertical axis consumption tomorrow. Line DB represents all possibilities of consumption today and tomorrow given a real interest rate.
2. Point A is the autarky point. This is the point when a household or a country does not trade and consume its endowment.
3. Point R is the optimal point where the slope of the budget line (the real interest rate) equals the slope of the indifference curve (the marginal rate of intertemporal substitution (MRIS)).
4. The change is due to an increase in the interest rate. The budget line becomes steeper and rotates about the endowment point A.
5. The consumer in this case is a borrower who tends to consume less today because the interest rate at which resources are brought forward has increased.
6. Points to the left indicates less consumption today than possible. This is not optimal because MRIS > the real interest rate. The value of last unit consumption today is perceived to be more worth than what they get back from savings tomorrow.
7. A way to place a country could be to look at their current accounts. Then you find countries like Norway and China with a surplus (points to the left from point R) and USA with a deficit (points to the right from point R).