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Modul 32721
Market Integration and Economic Development

Leseprobe

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Contents

Chapter 1

Introduction

The main goal of the course is to study the interaction between globalization and economic growth. The course discusses the issues related to economic development, such as growth, trade, and migration, using the most common theories applied both to the developing and to the developed countries. The frameworks presented in these lecture notes provide a deep understanding of the interdependency between developing and developed economies when goods and factor markets are integrated.

Many of the models illustrated in the course may be familiar to you from your Bachelor studies. For instance, the Solow model of economic growth, the only chapter not dealing with international trade, and the canonical trade models have already been discussed in other modules. However, we provide much more details and we blend the models of international trade with the workhorse growth model. Hence, a sound knowledge of the contents of the previous material is an advantage, but is not a prerequisite. The course presents all the models from scratch and it includes detailed explanations of the relevant mathematical and econometric tools. When appropriate, some recent stylized facts are used to motivate the different frameworks.

A natural starting point for the analysis of economic development is a discussion on economic growth. Hence, Chapter 2 provides a rigorous theoretical treatment of

the Solow model and an illustration of the related empirical growth studies. First, we tackle the question, "Why do countries grow?" Capital formation is one potential source of economic growth, but such a growth potential is limited without technological change. Despite being quite intuitive and straightforward, this concept is treated in-depth, following the illustration on the advanced textbook on economic growth by Acemoglu (2008). Equipped with the insights derived from the model, we analyze the question "Why have some nations failed to grow?" Indeed, while some countries have demonstrated a sustained economic growth through technological change, some others have remained stuck at low levels of per-capita GDP and have not exhibited any growth. We dedicate one section of the chapter to this puzzle, presenting the discussion as summarized in Acemoglu (2008). The prominent answer given in the literature relies on the existence of institutions. Indeed, the country institutional setting provides a safe environment for entrepreneurs to invest. The absence of such an environment may render capital formation inefficient, thus resulting in low rates of economic growth.

Another pillar of economic development is trade in goods and factor inputs. The canonical trade models studied in Chapter 3 are able to rationalize international linkages between developed and developing countries based on technology or endowment differences. Countries specialize in particular industries where they produce with lower opportunity costs. The idea of a comparative cost advantage, which determines international trade patterns, depends on country-specific differences in observable characteristics such as technology (Ricardo) or factor endowments (Heckscher Ohlin). More recent models focus on intra-industry trade. This implies that countries tend to export goods produced in sectors where they have a relative cost advantage compared to the rest of the world, while they tend to import goods that can be purchased cheaper on the world market rather than domestically. The idea that comparative advantage matters appears to be plausible in the context of developing economies. Indeed, when looking at trade between developing and developed countries, specialization in particular industries is evident in the data. However, a

drawback of these classical trade theories is that they are not able to explain why similar countries import and export goods produced in the same industry.

Besides growth and trade, the other face of globalization is international migration, which constitutes the subject of Chapter 4. Indeed, migration movements represent a recurrent pattern from developing to developed countries. Moreover, the "loss" of individuals due to migration away from developing countries has been a crucial topic both for the academic and policy debates. Hence, the aim of this chapter is to provide an overview of the international migration movements and the interrelated Brain Drain phenomenon. Specifically, we answer the following question: "Why do people migrate?" In doing so, we review the theoretical frameworks that provide explanations behind the individual migration decision (that is, at the micro-level). We then proceed by answering the same question from the aggregate perspective, analyzing the determinants of the migration patterns at the macro-level and presenting the associated empirical evidence. Not all individuals from a given population have the same propensity to migrate. Thus, we inquire about who chooses to migrate, stressing the importance of the issue of the immigrants' "selectivity" for the study of migration. Finally, we offer a brief overview of the economic effects of immigration on the host country.

The final Chapter 5 discusses models that nest both trade and capital formation. These extensions of the Solow growth model include versions with migration, foreign direct investment or trade in goods. The canonical trade models are blended with the workhorse model in the growth literature in order to understand their interactions. Under autarky, the only way to build up a substantial capital stock is through investment. Households face a trade-off between consumption and savings that can be used for capital formation. Moreover, due to diminishing returns to capital and labor, factor income depends solely upon factors' marginal productivity. Once we open those economic growth models to international trade in goods and factors, i.e. migration and foreign direct investments, the pattern of economic growth is substantially differ-

ent. We have to take the evolution of world prices into consideration, which produces outcomes that are not as straightforward as is the case in more 'basic' frameworks. For example, taking into account the effects of trade on economic growth in developing economies has important repercussions on some of the most important objectives of government's policy. The last part of the chapter is dedicated to the Brain Drain, where we will show the most recent theoretical framework on the effects of the Brain Drain for the growth of the developing country.

Recommended literature. The foundation of this course is the textbook "Introduction to Modern Economic Growth" from Acemoglu (2008), which looks at different aspects of economic growth from different angles. Many of the aspects covered in this textbook are not touched upon in the lecture notes. We highly recommend this book for a more involved study of the course subjects. Chapters on trade in goods and factors build upon the textbooks from Feenstra and Taylor (2014) and Feenstra (2004). The first gives a more intuitive treatment of international trade models and empirics, whereas the latter one is more advanced. Both books are highly recommended and can be used for other courses provided by the chair of "International Economics". Moreover, the three books provide further topics that are highly relevant for theses in International Economics. The treatment of the issues on international migration and on the brain drain is based on different sources (notably Borjas, 1987; Dustmann and Görlach, 2016; Ottaviano and Peri, 2012; Docquier and Rapoport, 2012). Notice that the lecture notes cannot be seen as substitutes for the recommended books as the descriptions in the textbooks are completely different. The textbooks describe the models in a much broader context, whereas our courses focuses on more specific issues. Moreover, the basic models discussed in this lecture are covered by many other textbooks as well but the structure may be different compared to the structure of our lecture notes. Nevertheless, the questions covered by the final examen will be based on the lecture notes and the tutorials provided online. The textbooks are helpful auxiliary materials and not complements or substitutes for the lecture notes.

1 The Ricardo Model of Comparative Advantage

Why do some countries trade? The Ricardo (1821) model of comparative advantage is one of the earliest attempts to answer this question in a very parsimonious way. Why parsimonious? Most importantly because the assumptions about the production process. Ricardo (1821) proposed a theory in which workers produce final goods in different sectors. Labor productivity in his theory is constant and determined by the state of technology in the respective sector in which the worker is employed. Workers are able to switch sectors without frictions that prevent them from being hired by particular firms. As long as some firms offer a higher income than others, all workers will want to move to the high wage firms as a consequence. Trade takes place between two different countries that are assumed to produce two goods using only labor inputs. For the sake of simplicity, other factors such as capital or land are omitted from the analysis. Thus, we refer to this model as a $2 \times 2 \times 1$ model: 2 countries (Home and Foreign) trade goods from 2 different industries (Good 1 and Good 2) that are produced by input of 1 factor (labor). The chapter builds on Feenstra (2004) and Van Marrewijk (2012).

1.1 The model basics

Workers are assumed to be homogeneous. This implies that they have similar characteristics, such as age, skill or ability. The implications of this assumption is best described by the idea of clones working in factories with different technologies. Differences in worker productivity stem from technology differences rather than from worker heterogeneity. The latter channel is switched off by assumption. Productivity differentials among the same workers employed in different sectors and/or different countries emerge through differences in technology across sectors and across countries. Only within a country-specific sector, all workers are identical and produce goods with the same labor productivity. Moving from one to another sector

changes the respective worker's productivity depending on the technology differences between the two sectors.

Goods production. The assumptions on technology and the absence of more than one input factor of production give rise to production functions with constant labor productivity. Worker productivity is independent from the level of production within a particular sector. One additional worker always increases production by the same constant factor and the factor itself depends on the technology parameter. Put differently, the marginal productivity of labor is constant. The production functions themselves can be characterized by sector-specific technology parameters, denoted by a, measuring the number of workers necessary to produce one unit of the output good. The higher this input coefficient, the less efficient the technology within a particular sector i. The productivity of one worker is equal to the marginal productivity $GP_i = 1/a_i$ where GP_i denotes the marginal productivity of a worker employed in sector i.

The sectors within each country can be distinguished by index i. One unit of good i must be produced by input of a_i workers. The production functions of both countries can be summarized by the following linear production functions

$$\begin{aligned} y_1 &= (1/a_1)L_1 \quad , \quad y_2 = (1/a_2)L_2 \quad , \\ y_1^* &= (1/a_1^*)L_1^* \quad , \quad y_2^* = (1/a_2^*)L_2^* \quad . \end{aligned} \tag{3.1}$$

Output in sector i is denoted by y_i and it depends on the total number of workers employed in that sector, that is, L_i. Put differently, one worker can produce $1/a_i$ units of the output good. Total production in each sector is therefore equal to the total number of workers employed times individual worker productivity. All foreign functions and variables are labeled using an asterisk.

Notice that consumers are indifferent between consumption of good i produced by foreign firms and consumption of good i produced by domestic firms. Good i is

homogeneous and therefore identical across countries. Import or export may still be beneficial for both Home and Foreign because of technology differences.

The endogenous variable in this model is the sector-specific labor input, L_i. However, labor inputs are limited by the total endowment. For the time being we assume that there is no migration between countries and each country's level of unemployment is zero. Thus, the total labor endowment governs the available amount of inputs in both sectors. We account for this restriction by introducing the following full endowment condition:

$$L_1 + L_2 = \bar{L} \quad , \quad L_1^* + L_2^* = \bar{L}^* \quad . \tag{3.2}$$

All workers are employed either in sector 1 or in sector 2 so that the sector-specific inputs of labor add up to total endowment $\bar{L}$ in Home and total endowment $\bar{L}^*$ in Foreign.

We reduce the number of equilibrium conditions to one equation with two unknowns in each country by combining the production functions (3.1) and the full employment conditions (3.2) as

$$y_1 a_1 + y_2 a_2 = \bar{L} \quad , \quad y_1^* a_1^* + y_2^* a_2^* = \bar{L}^* \quad , \tag{3.3}$$

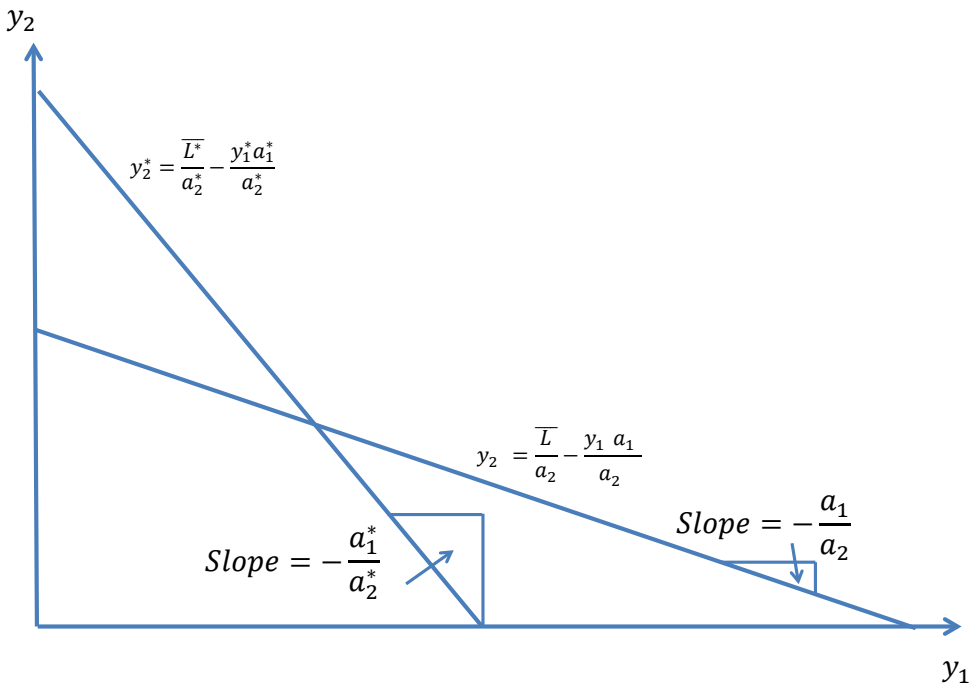
which can be solved to give the production possibility frontiers by solving for y_2 and y_2^*

$$\textbf{PPF:} \quad y_2 = \frac{\bar{L}}{a_2} - \frac{y_1 a_1}{a_2} \quad , \quad y_2^* = \frac{\bar{L}^*}{a_2^*} - \frac{y_1^* a_1^*}{a_2^*} \tag{3.4}$$

Figure 3.1 shows the PPFs for Home and Foreign. It is worth mentioning that the slope of the PPFs represent the opportunity costs of production in sector 1. Suppose you want to produce one more unit of good 1. How many goods of sector 2 must be given up for the additional output in sector 1? The answer is that a_1/a_2 goods have to be given up in order to get the extra amount of labor input required in sector 1, which is $\Delta L_1 = a_1$. How many goods could have been produced in sector 2 using this

particular amount of labor? One worker can produce $1/a_2$ units of good 2. Therefore, the a_1 workers could have produced a_1/a_2 goods in sector 2.

Figure 3.1: The production possibility frontier at Home and Foreign



Moreover, the shape of the two budget constraints is different at Home and at Foreign by assuming without loss of generality that $\frac{a_1^*}{a_2^*} > \frac{a_1}{a_2}$. The foreign production possibility frontier is steeper than the domestic production possibility frontier. The slopes represent the opportunity costs of production. Thus, opportunity costs in the foreign sector 1 are higher than the opportunity costs in the domestic sector 1. This result solely stems from the assumptions imposed on technology.

Optimal production program. Production in the closed economy must equal consumption because goods cannot be imported in order to augment production facilities and all production must be sold to domestic consumers. As a consequence, the invisible hand guides producers and consumers to the point where no resources are wasted and production equals consumption. Every worker receives a wage w, which can be

spent on the two different commodities produced in the two different sectors. First we derive all equilibrium outcomes for the autarky scenario in the closed economy setting of the model. Those results serve as benchmark for evaluating the effects of trade liberalization on welfare. We are going to ask how wages and utility change when markets open up to free trade. The answer can be given comparing the key variables before and after the goods market liberalization.

Consumption is limited by budget E that can be spent on C_1 and C_2 evaluated at goods prices P_1 and P_2. Total expenditure can't exceed the household's budget E, which translates into

$$C_2 = \frac{E}{P_2} - \frac{C_1 P_1}{P_2} \quad , \quad C_2^* = \frac{E^*}{P_2^*} - \frac{C_1^* P_1^*}{P_2^*} \quad . \tag{3.5}$$

The budget constraint can be used in order to solve for the optimal consumption and production program but before doing so we have to characterize the consumers' preferences. Every possible consumption program can be associated with a particular utility level that allows the consumer to discriminate between the different outcomes. By consumption program we refer to a particular consumption mix C_1, C_2. To keep things as simple as possible we assume that all consumers are represented by one consumer consuming the complete production output from sector 1 and sector 2. Preferences enable consumers to evaluate total consumption by

$$U(C_1, C_2) = C_1^{\alpha} C_2^{1-\alpha} \quad . \tag{3.6}$$

Unless otherwise stated, we assume that preferences are Cobb Douglas or at least have comparable properties. Notice that one particular level of utility $\bar{U}$ can be associated with many different combinations of C_1 and C_2 for which the level of utility, U, is identical. We say that the representative consumer is indifferent between all combinations of consumption programs associated with the same level of utility, $\bar{U}$. The preferences formulated in (3.6) allow consumers to substitute consumption of one

good with consumption of the other good, leaving the total level of utility constant. The consumption ratio between both goods that is necessary to keep utility constant is governed by the elasticity of substitution α and by the level of consumption C_1 and C_2. Generally speaking, we know that more consumption always increases utility. Shifting the indifference curve outwards is therefore associated with higher welfare. Rational consumers target the highest indifference curve that can be reached conditional on the available budget of the household. The respective indifference curve can be found using a utility maximization problem

$$\max_{C_1,C_2,\lambda} \quad U(C_1,C_2) \quad \text{subject to} \quad E = C_1P_1 + C_2P_2 \tag{3.7}$$

that has to be solved in both countries through changing C_1 and C_2 until the maximum level of utility is reached. The solution must not violate the budget constraint (3.5). We can use the Lagrangian method in order to compute the equilibrium consumption levels through

$$\mathcal{L} = C_1^{\alpha}C_2^{1-\alpha} + \lambda(E - C_1P_1 - C_2P_2) \quad , \tag{3.8}$$

where λ is the shadow value of income. The first order conditions of this problem can be derived through the first derivative of the Lagrangian with respect to C_1 and C_2,

$$\frac{\partial \mathcal{L}}{\partial C_1} = \alpha C_1^{\alpha-1}C_2^{1-\alpha} - \lambda P_1 = 0 \quad , \quad \frac{\partial \mathcal{L}}{\partial C_2} = (1-\alpha)C_1^{\alpha}C_2^{-\alpha} - \lambda P_2 = 0 \quad . \tag{3.9}$$

Both can be solved for λ in order to obtain

$$\frac{P_1}{P_2} = \frac{\alpha}{(1-\alpha)}\frac{C_2}{C_1} = \frac{\partial U/\partial C_1}{\partial U/\partial C_2} \quad . \tag{3.10}$$

The highest indifference curve is the one that is tangential to the budget constraint, which is the indifference curve with a slope equal to the relative goods price. Moreover, the consumption point must fall together with a feasible production point lying on the production possibility frontier. Consumption points above the production possibility frontier may yield a higher utility but they are not reachable at the given bud-

get level. Points below the frontier are feasible but resources would be wasted. Thus, the optimal solution is the consumption point on the PPF that fulfills the properties derived in (3.10).

Wages in the Ricardo model. Labor markets are assumed to be competitive. Firms in both industries compete for workers who may instantaneously switch between sectors. Both sectors have to pay the same wages in order to avoid giving incentives to move to the sector that pays a higher wage. Moreover, workers receive a wage that equals the value of their marginal product evaluated at equilibrium goods prices. Suppose that workers receive a wage w_1 in sector 1 and w_2 in sector 2, both being equal to the value of the workers marginal productivity within the respective sector. One additional worker in sector i generates additional output, $1/a_i$, of the respective good sold for price P_i. In equilibrium $w_1 = w_2 \Rightarrow P_1\frac{1}{a_1} = P_2\frac{1}{a_2}$. Otherwise only one sector, the sector that pays higher wages, can be active. We use this condition to derive

$$P_1\frac{1}{a_1} = P_2\frac{1}{a_2} \quad , \tag{3.11}$$

which can be rearranged in order to obtain

$$\frac{P_1}{P_2} = \frac{a_1}{a_2} \tag{3.12}$$

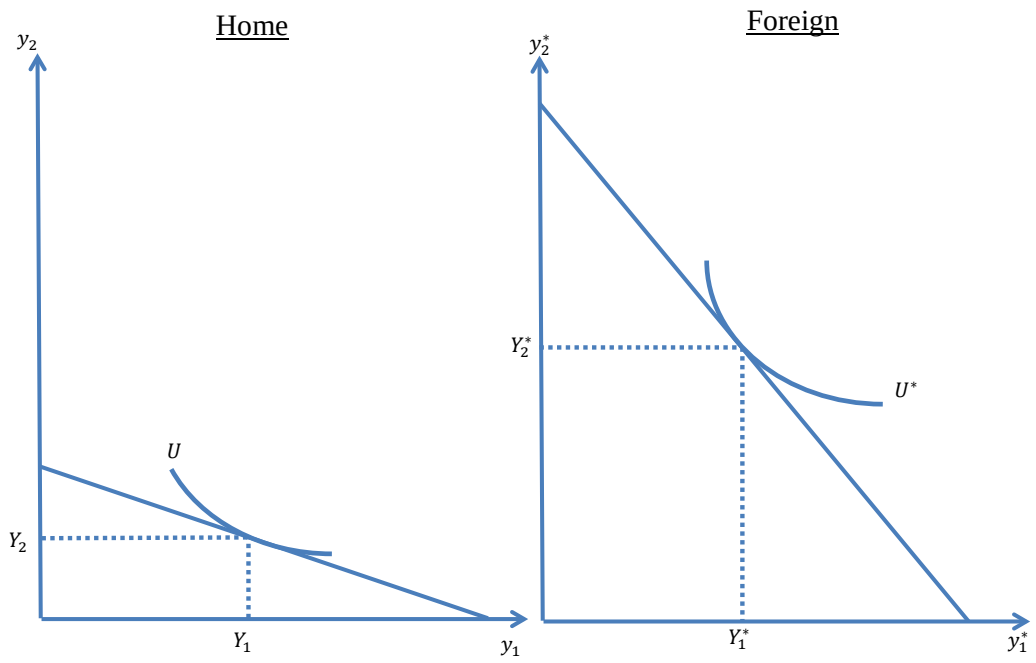
Wages in both sectors can be equal if and only if the slope of the budget constraint ($\frac{P_1}{P_2}$) equals the slope of the production possibility frontier ($\frac{a_1}{a_2}$).

Notice the difference between absolute and relative prices. Wages depend on the absolute price in a given sector, whereas most of the equilibrium conditions derived in the remainder of this course depend on relative prices denoted by a small p. We will always distinguish between the autarky and world market levels of certain variables, which are distinguished by index w (world market) and index a (autarky).

Putting the whole model together. The optimal consumption and production program can be derived in Figure 3.2. We draw the production possibility frontiers, the budget constraints and the utility indifference curves for Home and Foreign in separate graphs. The PPF and the budget constraints fall together under autarky and the slope of the budget constraint must be equal to the relative goods price. The relative goods price itself must be equal to the ratio of the input coefficients and the consumption/production points must lie on both the PPF and the budget constraint. The only way that all conditions are fulfilled is if both PPF and budget constraint lie together.

The first order condition of the utility maximization problem is fulfilled in Y_1, Y_2 and Y_1^*, Y_2^* in Figure 3.2. Obviously, the slope of the indifference curve equals the relative goods price, represented by the slope of the budget constraint. The consumption point is feasible because it lies on the PPF. Notice that we are using capital letters to denote absolute production levels: for example, Y_1 is the level of production in sector 1.

Figure 3.2: Optimal production/consumption under autarky



The consumption points are identical to the production points under autarky. We therefore neglect them on the graph.

1.2 Gains from trade

Suppose that the economies open up to free trade. Producers can export goods at world market prices. Consumers can choose between purchasing foreign goods in order to substitute consumption of domestically produced goods. Thus, the autarky prices determined in the previous paragraph are no longer binding. That said, we will show that both economies are better off under free trade due to positive gains from trade. Producers will specialize according to comparative advantage: every country exports the good it can produce with lower opportunity costs of production and it imports the good where it has an opportunity cost disadvantage. Due to the linearity of the production function both countries completely specialize in the production of one of the two sectors. All workers move into the comparative advantage sector and the other sector shuts down completely.

Sound knowledge of the mechanics behind the effects at work is the key to understand the relationship between the relative goods prices under autarky. Suppose the two countries in our model can be characterized by

$$1/p^a = \frac{P_2}{P_1} > 1/p^{*a} = \frac{P_2^*}{P_1^*} \quad . \tag{3.13}$$

This relationship tells us that the assumptions of the model are such that the relative autarky price of good 2 is higher in Home than in Foreign. But how do such differences emerge? Notice that the relative autarky prices reflect the opportunity costs of production under autarky. Opportunity costs can be explained by international technology gaps. The opportunity costs of producing good 2 are lower in Foreign than in Home if the foreign country has a comparative cost advantage due to a relatively more advanced technology within this particular sector. It is the term "relative" that

is important for understanding the determinants of international trade. The absolute advantage is important in determining the relative price ratio under autarky. Instead, the relative technology advantage compares one sector's productivity relative to the other sector's across countries. The price differences across countries under autarky allow us to derive the pattern of trade intuitively.

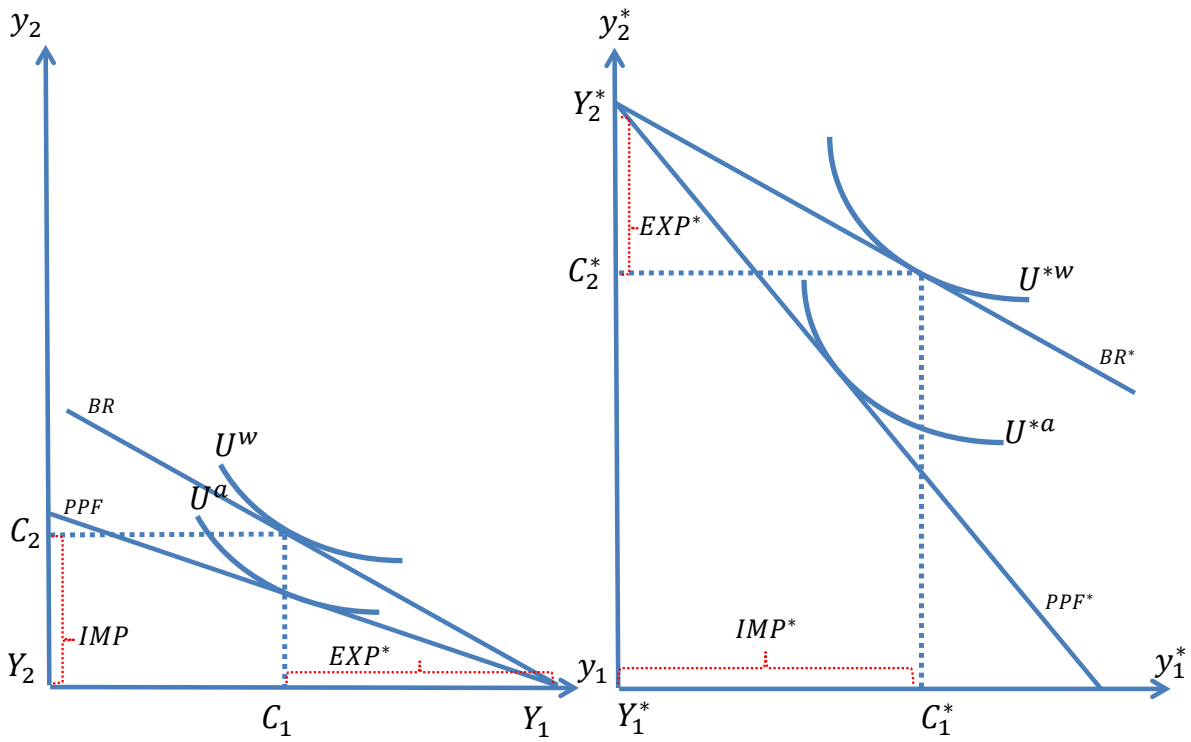
Consumers in Home have an incentive to purchase good 2 from foreign suppliers as the good is relatively cheaper there. The autarky price differential generates incentives for domestic firms in sector 1 to produce more. Their output can be sold for higher prices in the foreign market. Thus, domestic resources shift towards sector 1 and the supply gap of sector 2 goods can be bridged through imports from Foreign. For the same reason we find the opposite pattern in the foreign country. From a foreign perspective the world market price must lie between the autarky prices as well. Having said that, it is easy to verify that foreign consumers can purchase good 1 from firms in Home and focus their resources on sector 2 instead. Moreover, goods prices adjust until trade between the two countries is balanced.

The free trade scenario is depicted in Graph 3.3. The slope of the budget constraint equals the relative world market price $p^w = P_1^w / P_2^w$, which is the same in both Home and Foreign. Thus, the slope of the home and foreign budget constraints must be equal under free trade. Moreover, we already know that the relative world market price lies between the relative autarky prices: $p^a < p^w < p^{a*}$. The budget constraint in Home becomes steeper and the budget constraint at Foreign becomes flatter when going from autarky to free trade.

The initial consumption point is no longer optimal because the representative consumer can reach a higher indifference curve. The budget constraints can be shifted outwards until they intersect the PPFs at the specialization points Y_1 in Home and Y_2^* in Foreign. This scenario is depicted in Graph 3.3. The first order conditions for the utility maximization problem are fulfilled at the new consumption point, where the slope of the indifference curve is equal to the relative world market price. This

point is represented by the tangency point between the indifference curve and the budget constraint located at C_2, C_1 and C_2^*, C_1^*. We can easily verify that the respective world market price is such that world trade is balanced. Production in Home is Y_1. All workers move into sector 1. Consumption is at a lower level C_1 than production, which is at Y_1. The difference between production and consumption is exported to Foreign. Home imports are determined by the consumption level of good 2. Sector 2 is inactive in Home so that all consumption of good 1 is imported from abroad. The opposite pattern can be found in Foreign. It can be seen that home imports of good 2 equal foreign exports of good 2 and home exports of good 1 equal foreign imports of good 1. The world market price is such that trade between the two countries is balanced. Moreover, we can see that both countries are better off. Home and Foreign can reach a higher indifference curve U^w and U^{*w}.

Figure 3.3: Optimal production/consumption under free trade



Bibliography

Acemoglu, D. (2008). *Introduction to modern economic growth*. Princeton University Press.

Barro, R. J. (1996). *Determinants of economic growth: a cross-country empirical study* (No. w5698). National Bureau of Economic Research.

Beine, M., Docquier, F., & Oden-Defoort, C. (2011). A panel data analysis of the brain gain. *World Development, 39*(4), 523-532.

Beine, M., Docquier, F., & Rapoport, H. (2008). Brain drain and human capital formation in developing countries: winners and losers. *The Economic Journal, 118*(528), 631-652.

Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: theory and evidence. *Journal of Development Economics, 64*(1), 275-289.

Beine, M., Docquier, F., & Rapoport, H. (2007). Measuring international skilled migration: a new database controlling for age of entry. *The World Bank Economic Review, 21*(2), 249-254.

Beine, M., Docquier, F., & Özden, Ç. (2015). Dissecting network externalities in international migration. *Journal of Demographic Economics, 81*(04), 379-408.

Bertoli, S., & Moraga, J. F. H. (2015). The size of the cliff at the border. *Regional Science and Urban Economics, 51*, 1-6.

Borjas, G. J. (1987). Self-selection and the earnings of immigrants. *American Economic Review, 77*(4), 531-53.

Borjas, G. J. (1991). Immigration and self-selection. In *Immigration, trade, and the labor market* (29-76). University of Chicago Press.

Brücker, H., Capuano, S., & Marfouk, A. (2013). Education, gender and international migration: insights from a panel-dataset 1980-2010. *Retrieved March, 20*, 2014.

Chiswick, B., & Miller, P. W. (Eds.). (2014a). *Handbook of the Economics of International Migration: The Immigrants.* Elsevier.

Chiswick, B., & Miller, P. W. (Eds.). (2014b). *Handbook of the Economics of International Migration: The Impact.* Elsevier.

Desai, M. A., Kapur, D., McHale, J., & Rogers, K. (2009). The fiscal impact of high-skilled emigration: Flows of Indians to the US.. *Journal of Development Economics, 88*(1), 32-44.

Docquier, F., & Rapoport, H. (2012). Globalization, brain drain, and development. *Journal of Economic Literature, 50*(3), 681-730.

Docquier, F., Lowell, B. L., & Marfouk, A. (2009). A gendered assessment of highly skilled emigration. *Population and Development Review, 35*(2), 297-321.

Docquier, F., & Marfouk, A. (2006). International migration by educational attainment, 1990-2000.

Docquier, F., & Rapoport, H. (2009). Documenting the Brain Drain of "La Creme de la Creme". *Jahrbücher für Nationalökonomie und Statistik, 229*(6), 679-705.

Dustmann, C., Ludsteck, J., & Schonberg, U. (2009). Revisiting the German wage structure. *Quarterly Journal of Economics, 124*(2), 843-881.

Dustmann, C., & Görlach, J. S. (2016). The economics of temporary migrations. *Journal of Economic Literature, 54*(1), 98-136.

Feenstra, R. C., & Hanson, G. H. (1995). *Foreign investment, outsourcing and relative wages* (No. w5121). National bureau of economic research.

Feenstra, R. C. (2004). Advanced international trade: theory and evidence.

Harris, J. R., & Todaro, M. P. (1970). Migration, unemployment and development: a two-sector analysis. *The American Economic Review, 60*(1), 126-142.

Krugman, P. R. (1979). A Model of Innovation, Technology Transfer, and the World Distribution of Income. *The Journal of Political Economy, 87*(2), 253-266.

Li, H., Li, L., Wu, B., & Xiong Y. (2012). The End of Cheap Chinese Labor. *Journal of Economic Perspectives, 26* (4), 57–74.

Lewis, E. (2004). *How did the Miami labor market absorb the Mariel immigrants?* (No. 04-3). Philadelphia, PA: Federal Reserve Bank of Philadelphia.

Lewis, E. G., Bodvarsson, Ö. B., & Van den Berg, H. (2010). The Economics of Immigration: Theory and Policy.

Van Marrewijk, C. (2012). *International Economics*. Oxford University Press.

Mayda, A. M. (2010). International migration: A panel data analysis of the determinants of bilateral flows. *Journal of Population Economics, 23*(4), 1249-1274.

Mattes, R., & Mniki, N. (2007). Restless minds: South African students and the brain drain. *Development Southern Africa, 24*(1), 25-46.

Nanda, R., & Khanna, T. (2010). Diasporas and domestic entrepreneurs: Evidence from the Indian software industry. *Journal of Economics & Management Strategy, 19*(4), 991-1012.

OECD, (2015). International Migration Outlook 2015, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/migr_outlook-2015-en

Olley, G. S., & Pakes, A. (1992). *The dynamics of productivity in the telecommunications equipment industry* (No. w3977). National Bureau of Economic Research.

Ortega, F., & Peri G. (2013). The effect of income and immigration policies on international migration. *Migration Studies, 1*(1), 47-74.

Ottaviano, G., & Peri G. (2012). Rethinking the Effect of Immigration on Wages. *Journal of the European Economic Association* 10(1), 152-197.

Pedersen, P. J., Pytlikova, M., & Smith, N. (2008). Selection and network effects-Migration flows into OECD countries 1990–2000. *European Economic Review, 52*(7), 1160-1186.

Ricardo, D. (1821). On the Principles of Political Economy and Taxation, London: John Murray.

Roy, A. D. (1951). Some thoughts on the distribution of earnings. *Oxford economic papers, 3*(2), 135-146.

Sajaastad L. A. (1962). The Costs and Returns of Human Migration, *The Journal of Political Economy, 70*(5), 80-93.

Solow, R.M. (1956). A Contribution to the Theory of Economic Growth, *The Quarterly Journal of Economics, 70*(1), 65-94.

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