The World Trade System: A Classroom Experiment[1]

Marc Piazolo
University of Applied Sciences Kaiserslautern, Germany

Introduction

What is globalization? How does international trade work? Which country wins, which country loses by opening its current and capital account? Are the rich getting richer and the poor getting poorer? These are some of the questions that are often raised by students early on in courses on International Economics as well as in Macroeconomics, the moment we move on to international relations. With the support of a game (or experiment) simulating the current world trade system, we can tackle these questions. Through first-hand experiences the students themselves will come up with answers and clues that can be compared with the real world. The discussions of the trading relationships as well as of their economic implications and results will broaden the students' understanding of international trade.

The paper is organized as follows: We start with a brief discussion on the various facets of globalization. There we concentrate on the the blessings and curses of free trade in goods and services. Chapter 2 describes the set-up of our experiment based on the world trade system. The simulation is an extended version of a game by Christian Aid, London 2002. In chapter 3, we present and discuss the specific results of our student simulation. The final chapter covers some general remarks on the applicability of this classroom experiment as well as its usefulness in explaining the complexity of real-world trading relationships.

[1] I would like to thank Alisa Boyce, Jasmin Fagin, Markus Gross and two anonymous referees for their valuable comments. All errors and shortcommings are, of course, mine.

1. Globalization – Facets and its Challenges

Globalization is a "process through which an increasingly free flow of ideas, people, goods, services, and capital leads to the integration of economies and societies" (Aninat 2002 4).[2] It is nothing new[3] and covers much more than just economic issues. Global integration has promoted human freedom by spreading information and increasing choices – often supported by technological advances (IT-revolution). Nevertheless, there has also been a dark side to it: the communications and transport systems that accelerated the pace of globalization are also used by terrorists, fundamentalists and international criminals. The activists of the anti-globalization movement (e.g. Attac) highlight the costs of rapid economic and structural change, the loss of local control over (economic) policies, growing income inequalities as well as environmental deficiancies and biased trade policies on the part of the industrial countries.[4]

On the other hand, even strong critics of the globalization process and the international institutions – like Joseph Stiglitz – propose that "globalization can potentially benefit, but it has not done so" (Basu 2003 887). Stiglitz himself praises the economic rise of East Asia and the spread of democracy. In his opinion globalization should not be halted, but made fairer and better through reforms of international institutions like the IMF, World Bank and WTO.[5]

In taking a closer look at the hard facts for reaching a verdict on the economic benefits of the process of globalization, we mainly refer to Fischer 2003. **Global poverty rates** – people

[2] According to Fischer (2003 2) globalization can be described more generally as an "ongoing process of greater interdependence among countries and citizens".
[3] Globalization in trade of goods and services, capital and labor flows thrived in the period before 1914. Only by 1973 was world trade as a percentage of GDP back to its 1913 level (Fischer 2003 3). Financial market integration reached its peak in 1900 with gross international investments to sample countries (major capital exporters) GDP at almost 60%, dropping to less than 20% in 1945 and reaching the 60% level not until 1990 again (Taylor 2004 29).
[4] E.g. Aninat (2002 4) and Watkins (2002 24-26).
[5] Stiglitz (2002 246-288).

living on less than 1$ per day – have declined significantly over the last 50 years.[6] Social indicators like adult literacy and life expectancy have improved. However, sub-Saharan Africa is the major exception due to persistent periods of negative per capita growth and the HIV/AIDS pandemic. **Inequality** between countries seemed to have declined slightly over the last 20 years – due to the rapid growth of China, India and Vietnam; while income distribution within countries has diverged.[7]

Trade policy is one of the main economic policy choices. The discussion on import-substitution versus export-promotion has long dominated the policy debate during the 1970s and 1980s. Greater openess and therefore integration into the world economy are associated with higher level of income and more rapid growth. The **export-led growth hypothesis** provides the theoretical foundation for the empirical assessment of economic growth through outward-orientation: foreign exchange earnings to finance necessary imports, efficient resource allocation making use of comparative advantage and economies of scale, knowledge spillovers as well as exposure to international competition and therefore, increased incentives for innovations lead to improved growth prospects.[8] Openness is fine, when you have got access to promising export markets. Yet reductions in tariffs as well as in non-tariff barriers since World War II have been much greater among the OECD countries than between industrialized and developing countries. The protection of the agriculture and textile industries of high-income countries is still significant. The "international trading system *is* biased against developing countries" (Fischer 2003 20) as industrial countries discriminate especially against those goods in which many developing countries are relatively more (most) efficient. In August 2004 the deadlock of the Doha trade round (WTO) was broken by

[6] From 55% in 1950 to 23% in 1999 (Global Economic Prospects, World Bank 2003; in: Fischer 2003 7-8). Though, the quality of the statistical data is quite poor.
[7] Dollar/Kraay (2002 28); Fischer (2003 11).
[8] Most of the cross country studies on the determinants of economic growth support the export-led growth hypothesis; see e.g. Bhagwati/Srinivasan (2002), Frankel/Romer (1999) and Piazolo (1994).

agreeing on a "framework for establishing modalities in agriculture" – meaning targets and rules for negotiations on freeing farm trade, hopefully finalizing the negotiations by 2006.[9] Thus, fairer trade should result in the scrapping of the trade bias against developing countries. Besides that, there is still quite a growth momentum for developing countries to gain by further South-South trade liberalization. In addition, recent empirical analysis indicates that the negative effects of current-account reversals due to a financial crisis on growth are less severe on countries with a higher degree of trade openness (Edwards 2004 63).

While the path for current account liberalization has be set ideologically and empirically, the controversy on **liberalizing the capital account** is far more fierce. Not surprising the Asian and subsequently the general emerging market crisis of 1997/1998 underlined this controversy. Opening the capital account, a country becomes more vulnerable to external shocks. As most advanced economies have open capital accounts, well-phased and – sequenced integration into global financial markets seem to outweigh the costs (e.g. risks) (Fischer 2003 14). The crises in Asian as well as in Latin American emerging markets (Argentina 2001, Brasil 2002) have shown that it is much more crucial for a successful capital account liberalization to correctly sequence the reforms and that certain preconditions – like a sound macroeconomic framework, strong domestic financial institutions as well as regulatory and supervising government authorities – have to be met.[10] On an international level, the role of the IMF in safeguarding the international financial system was redefined, especially in trying to find ways to bail-in private sector creditors.[11] In 2003-2004, **private sector capital** – like foreign direct investment, portfolio investment, bank lending and international bond

[9] Industrial countries promised to eliminate their export subsidies, to reduce trade-distorting domestic subsidies and to cut down substantially on tariff protection (Economist 2004 59).

[10] The degree of financial openness does not appear to be related to the intensity with which current-account reversals affect real economic growth negatively (Edwards 2004 63).

[11] Häusler (2002) lists the various initiatives launched by the IMF to enhance its ability to contribute to international financial stability. Collective active clauses on international bonds and Anne Krueger's Sovereign Debt Restructuring Mechanism reflect two proposals to draw in the private sector in the case of a financial (debt) crisis.

issues - has rebounced to significant levels since the outbreak of the emerging market crisis, but they are concentrated on a small sub-set of emerging markets.[12] Poor regions actually receive very little capital - private as well as public (Taylor 2004 31). The total amount of **official aid** was approximately 60 $ bn p.a. during 1990-2000, less than a third of what the industrial countries had originally committed themselves to during the seventies (0.22 % instead of 0.7% of GDP). Besides the rationale of stronger fiscal discipline in OECD governments, there has been growing scepticism about the effectiveness of aid. This scepticism is at least (partly) supported by recent economic analysis.[13]

Another source of private capital flowing from North to South are **remittances** from migrant workers. Even though globalization of labor seems to be lower than a century ago, remittances amounted to more than 80 $ bn p.a. during the last 15 years – much more than official aid.[14]

During the course of our classroom experiment we will touch and later discuss various of the above facets of globalization. As the core of our simulation is about trading relationships between the different groups or countries involved, let us briefly present the real world's regional **merchandise trade** in graph 1.[15]

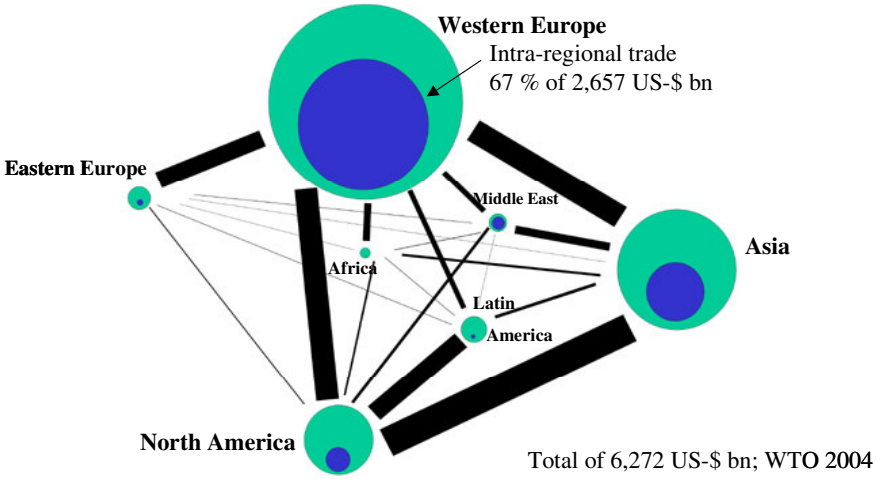
[12] Private capital flows (net) to Emerging Market and Developing Countries dried up from a peak of 197 $ bn in 1996 to 47 $ bn in 2001. They are projected to be revitalized to 80-120 $ bn in 2003/2004. Emerging Asia might even reach their pre-1998 crisis level of net capital inflows in 2004, accounting for almost 60% of all inflows (IMF 2004 Tab. 1.3).

[13] While Burnside/Dollar (2004 784) still believe that „aid directed to countries with good policies will be more likely to produce good results" like higher GDP growth, Easterly et al. (2004) are much more sceptical. By extending the data set of Burnside/Dollar, they no longer found significant evidence that „aid promotes growth in good policy environments" (Easterly et al. 2004 779).

[14] Claudia Busch et al. 2002 in Fischer (2003 3) and Ratha (2004) as well as Reinert (2004).

[15] Graph 1 is an updated version of KoopmanIFranzmeyer (2003 17).

Graph 1 – Intra- and Inter-regional Merchandise Trade in 2002 (exports)



World merchandise exports amounted to a total of 6,272 $ bn in 2002, which is slightly less than 20 % of world GDP. The European Union member countries (15) account for 39 % of world exports, the U.S. only for 11 %.[16] However, the major feature of regional world trade is the large share of intra-regional trade: 50 % of all exports are directed to their own region. Again the EU accounts for the highest share of intra-regional trade (67 %), followed by Asia (49 %) and North America (40 %). Therefore, North-South trade – between high-income and low & middle income countries - accounted only for a quarter of total world trade (World Bank 2003 Tab. 6.2). In Chapter 3 we will compare these real world regional trading relationships with the results of our classroom simulations.

2. World Trade System – the Classroom Experiment

Our classroom experiment is based on the Trading Game developed by Christian Aid (2002).[17] We extended the original version after two trials in 2003 to be able to use it as a real

[16] Due to its large current account deficit, the U.S.'s world import share was 18 % in 2002 (WTO 2004 Tab. III.1-2).

[17] The German version was published by the Technical University of Darmstadt (1996) and is often used by the educational consultancy "Spieltrieb GbR", Till Meyer. Peterson and Wallace's (2002) international trade simulation closely resembles the Trading Game of Christian Aid – although with no reference to it. Compared to our setup, they concentrate more on environmental issues. Also, the demand side of the market is less transparent as price fluctuations are not explained to producers, on the other hand prices of resources are fixed. They

world simulation. It has now become a true classroom experiment due to the possibility of replication within a fixed setting and course of events during the simulation period. A suggestion for an economic interpretation of the findings is presented in the following chapter. We propose the game be played in two separate classroom periods of 90 minutes each.[18] The first part consists of the simulation itself; the second period should be used to present the trading activities as well as to interpret and discuss the results with their economic implications.

Let us start with the general set-up of the game:

(1) Students will be split up into six groups or countries; in addition there is a World Bank group, which monitors and runs the simulation.

(2) Each country manufactures goods (shapes) from raw materials.

(3) Countries sell (export) their products to the market; they represent rational as well as profit maximizing participants trying to make as much money as possible within the given time period.

(4) Prices of export goods fluctuate according to excess supply. This changes the terms of trade and creates new trading opportunities.

(5) During the simulation period several events create new manufacturing as well as trading opportunities; these are aid to poor countries, dispersion of new information as well as of new technologies, the exploration of natural resources and environmental protection laws in rich countries.

---

recommend their simulation for the discussion of the varius aspects of international interactions between rich and poor nations leading to the student's focus on interdisciplinary topics like crime, discrimination and nationalism (Peterson/Wallace 2002 8-9). Their simulation is the one listed on http://www.marietta.edu/delemeeg/games/table1.htm that comes closest to ours. Our World Trade System concentrates on the production and trade of goods based on initial resource endowments and models the demand side realistically – resembling an experiment due to replicable events. Therefore, the results of the simulation by different student groups – e.g. their behaviour and interactions - can be interpreted more successfully.

[18] If the students have not be exposed to international economic topics before, then an additional lecture period on the general facets of globalization is recommended.

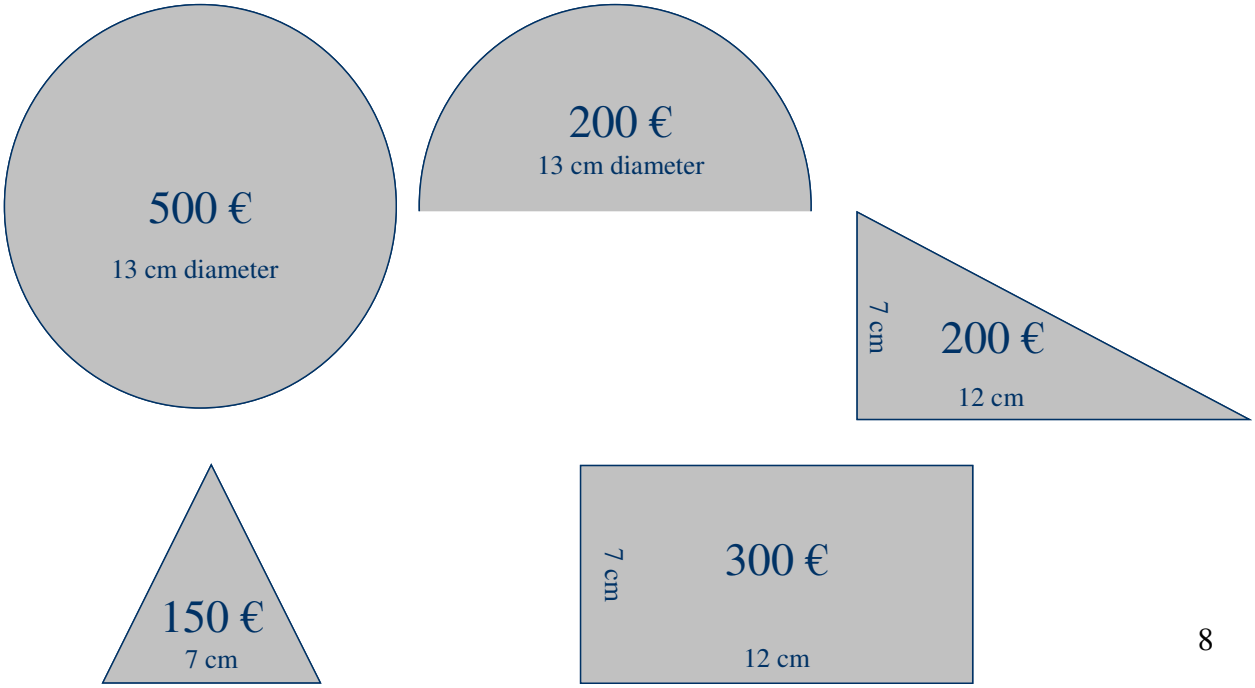
The resource endowments of the different countries, which the students received in enclosed envelopes, are presented in table 1. Only during the game did they find out what resources the other groups possessed. The values of the different resource endowments are based on trading activities during the simulation. To give the students an idea of what kind of countries they represent, examples of OECD members like Korea to Low Income countries like China are given in the last two columns.

Table 1 – Resource Endowments (1)

Country (# of players per group)	**Resource Endowment**	**GDP** (in €)	**GDP p.c.** (in €)	**Comparable Countries** (GNI p.c. in US$, 2001)	
A 1	1 set of shapes 2	19,900	9,950	Greece	11,430
A 2	pairs of scissors 2	19,900	9,950	Korea	9,460
(2 students)	rulers			Portugal	10,900
	2 pencils2 sheets of paper				
B 1	1 ruler	6,700	2,235	South Africa	2,820
B 2	10 sheets of paper	6,700	2,235	Thailand	1,940
(3 students)				Turkey	2,530
C 1	5 sheets of paper	1,625	1,100	China	890
C 2	2 sheets of red	1,625	1,100	Morocco	1,190
(4 students)	paper			Philippines	1,030
World Bank	1 set of shapes				
(3 students)	100,000 €				
	10 sheets of paper				

Source for GNI – Gross National Income; World Bank (2003) Tab. 1.1. The shapes are made of wood or cardboard. According to the World Bank classification, group A countries are High Income countries, group B represent Lower Middle Income countries and group C Low Income countries.

Graph 2 – Diagram of Shapes (2)



There are five export products (shapes) the six countries can manufacture and sell to the market, e.g. the World Bank. The different shapes with their exact measurements as well as their initial values per product are presented in graph 2. It is important to note that all paper products have to be of the exact sizes and shapes. To manufacture a protractor size (semi-circle) as well as a set-square size you need one more labor activity compared to the circle (pie) or the rectangle.

The **World Bank** represents the demand side of the market - e.g. consumer interests. One country representative (producer) offers the World Bank a number of goods (shapes) to be sold – there is a minimun of five products to be sold. First of all, the banker checks the product quality by comparing the paper shape with his own model. If the quality is bad, the goods are not accepted by the World Bank. Secondly, the Banker buys up the goods according to their present prices. Either he hands out cash or he credits the export value to the country's bank account. In a third step, the World Bank will adjust the export prices of individual shapes depending on the excess supply of goods. The price fluctuations have to be published instantly – either on the blackboard or through a beamer (activities 3-4).[19]

The World Bankers are in charge of organizing and running the simulation. In appendix 1 you will find the organizational questions that have to be addressed for a successful simulation. At the start, the president of the World Bank announces the following (simple) rules of the game in table 2.[20]

[19] One World Banker has to monitor, record and publish the price fluctuations.
[20] As suggested by a conference participant, the World Bank could be split up into one person running the simulation and two students representing a consumer organization to which the goods are sold, which checks their quality and monitors the price fluctuations.

Table 2 – Rules of the Game

1. All of the **shapes** (goods) have to be cut by a pair of scissors, and they must be of the exact size shown.
2. These products can be sold to the **World Bank** in batches of a minimum of five goods. You can either receive cash or the export value is accredited to your country's account.
3. **Prices** of goods drop by 50 € for every accumulated batch of 10 goods of the same shape that have be sold to the World Bank. After five minutes the World Bank resets the price.
4. Only the **materials** that have been given out can be used.
5. **Cheating** or physical force is not allowed. The President of the World Bank can intervene in any disagreements.
6. All **transactions/arrangements** between countries or with the World Bank are to be documented.
7. Maximize the country's **wealth**. Products in stock are not accounted for.

The World Bank also announces the different events during the simulation period of 75 minutes. Table 3 presents the time schedule of events. Of all the listed events, the newsletter that can be purchased by one of the industrial countries - in minute 50 - is of special relevance: This letter contains the information that if A countries attach a 2 by 2 cm piece of red paper to each of their products, these will be worth four times their listed value. It simulates purchasing a patent for process innovation that increases productivity. For the other countries, red paper is of no special use.

Table 3 – Time schedule of events (5)

Minute	Events
0	1. Reading of the Rules 2. Distribution of the resources (envelope) **START**
10	**Aid** from World Bank to countries C: one pencil each for 5 minutes.
15	Collection of the pencil from countries C
20	1. **Aid** from World Bank to countries C: one pair of scissors each for 5 Minutes. 2. Countries A have to be clean of **waste** at minutes 30, 60 and 70 – otherwise they will face a fine of 1,000 € to the World Bank.
25	Collection of the pair of scissors from countries C
30	1. **Additional natural resources** have been found in countries C (4 sheets of paper each) 2. Control of countries A having disposed of their waste.
40	Publication of **general news** on trade topics by transparencies
50	1. **Additional natural resources** have been found in countries B (1 sheet of red paper each) 2. One **newsletter** can be purchased or auctioned by countries A
60	1. **Aid** from World Bank to countries C: 500 € each. 2. Control of countries A having disposed of their waste.
70	1. Control of countries A having disposed of their waste. 2. **Information** that the experiment ends in 5 minutes.
75	**END**

3. The Results of our Classroom Experiment

Here we present the results of our classroom experiment run in the course "Experimental Economics" during the spring term of 2004 with 20 students.[21] However, the specific set-up of this experiment received major impetus by two previous (trial) simulations, in which (a) we did not specify the events and (b) did not document the transactions/price fluctuations properly. The participating students were 3rd year undergraduates majoring in Entrepreneurship or Finance; all of them had passed a Micro- and Macroeconomics course.

[21] "Experimental Economics" is a course jointly held with my colleague Heinrich Wickum. The background data is from a seminar paper of our students C. Tabatt and M. Ulukaradag (2004). By spring 2005, we developed a computer simulation to run this experiment – for transparency and documentation especially of real time charts on the various prices of goods and the countries' bank accounts (Piazolo 2005).

Just by taking a look at the differences in resource endowments and the "size" of the three country groups (# of students) the students figured out, which group reflects what kind of country type in reality – from industrial to developing countries. Based on a total of 23 actual trading activities during the simulation period, we derived the monetary value of the (raw) materials in Table 4.

Table 4 – Valuation of (raw) Materials

Material	**# of Transactions**	**Mean Value in €** (Median Value in €)	**# of Material in Circulation at Start**
Pair of Scissors	4	4,300 (3,000)	4
Pencil	3	2,500 (1,500)	4
Ruler	2	700	6
Shapes	4	Twice their initial value: 300-1,000	2 sets of shapes; e.g. 10 shapes
Paper (white)	8	600 (500)	34
Paper (red)	2	1,750	4

The empirical valuations of the different factors of production (pair of scissors, pencil, ruler and shapes) as well as of the two natural resources (red & white paper) seem to reflect the theoretical values that these materials possess: 1. One cannot substitute a pair of scissors as the World Bank checks the product quality (Rule 1); 2. A pencil is more important than a ruler or the shapes, since one can substitute the ruler and three of the shapes (rectangle and triangles) by drawing a model of them once,[22] and producing them thereafter just with the help of the first model. In addition, there are more rulers and shapes than pencils in circulation (last column of table 4). 3. Due to the information in the "newsletter" to one of the A countries in minute 50, the valuation of red paper rises significantly over that of normal white paper.[23] Thus, in theory the following should hold:

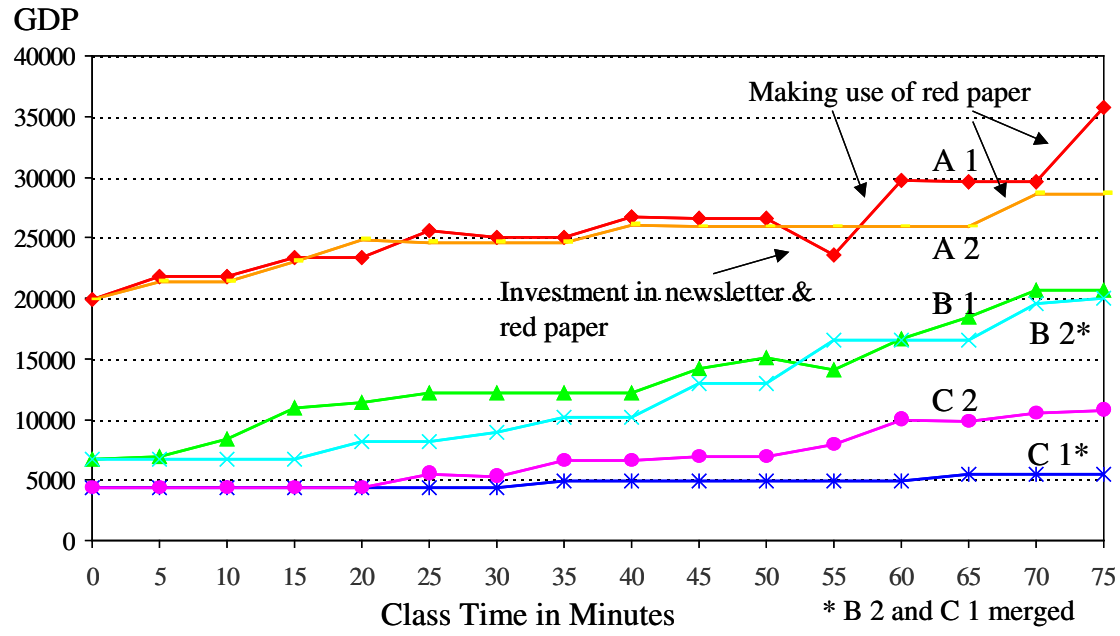
[22] The group does need a ruler and the original shapes once for the production of the first model.

[23] The value of white paper could also be derived by the added values of different shapes to be produced with one sheet of paper. Applying the initial values, one can produce "4 semi-circles & 4 triangles (7 cm)" worth 1,400 € to up to "16 triangles (7 cm)" worth 2,400 €. But, one needs to have a pencil, ruler and pair of scissors in addition to the natural resource: paper.

Pair of Scissors > Pencil > Ruler > one Shape > < red Paper > white Paper.

As the empirical valuations coincide with the theoretical values, we therefore based our calculations for the "GDP" and "GDP per capita" for each type of country on these valuations (see table 1). Now, let us take a look at the development of a country's wealth over time, which is given in graph 2.

Graph 2 – Development of Wealth

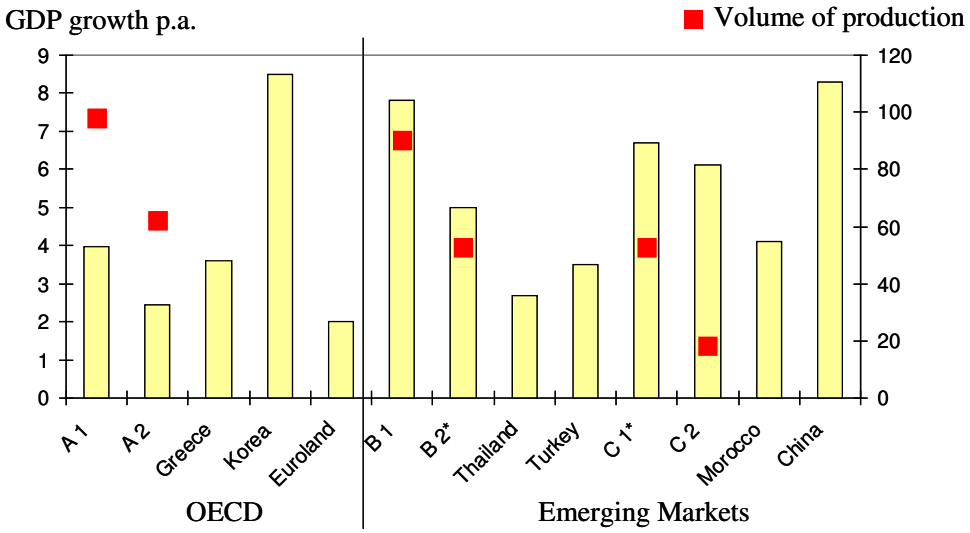


The industrial countries started out rich and they also ended up rich, the opposite is true for the low income countries (groups C). The latter actually only started producing very late in the game, as they lacked physical capital ("machines"). Most of their income was drawn in by selling their natural resources, buying up waste from the industrial countries or by offering labor-intensive production lines to other countries (C 1). Two countries formed an Economic Union – B 2 and C 1 – making use of the division of labor, where C 1 drew the shapes and B 2 cut and sold them to the World Bank. In the end, the profits of both groups added up and were divided equally. As one sees in this second graph, country A 2, which did not invest in

the newsletter of minute 50, also made use of the small red paper shapes in the second-to-last period. During the classroom discussion they explained that they had acquired the knowledge on the special value of the red paper by illegal means, e.g. by industrial espionage!

In absolute terms – excluding stocks – the increase in wealth over the whole simulation period is as follows: A 1 (15,800 €), B 1 (13,950 €), A 2 (8,750 €), B 2 (7,225 €), C 1 (7,225 €) and finally C 2 (6,300 €).[24] For Low Income countries one has to take into account the official aid that they had received from the World Bank, in total worth 950 €.[25] This represents 12-15% of their accumulated wealth. Another 450-500 € they earned by importing the waste of the industrial countries. For all countries the picture looks quite different, when you look at it in relative terms – over 15 five-minute periods (years).

Graph 3 – Economic Growth and the Volume of Production



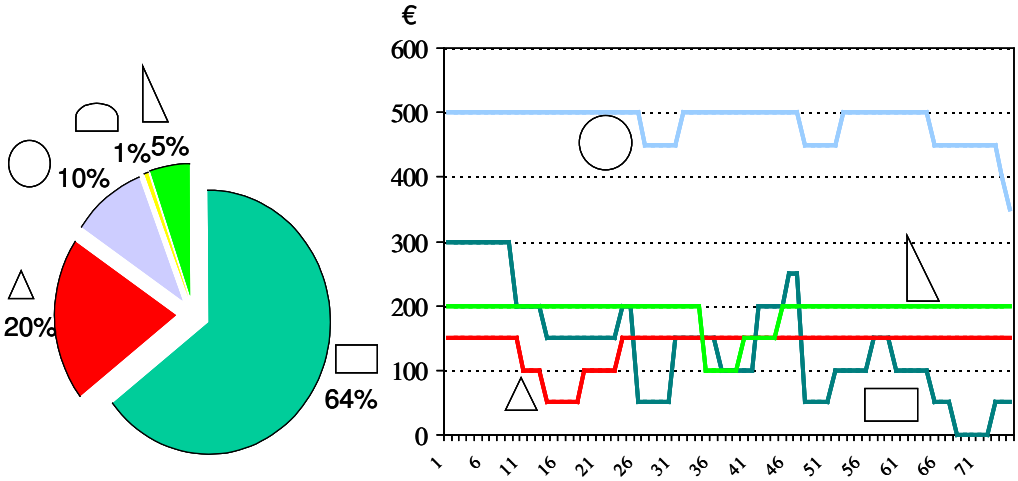
Based on 15 five minute periods (years); other countries: 1996-2004 (IMF 2004)

[24] Surprisingly at the end of the game, country A 2 still had a very large value of products in stock (14,800 € - valued by their final listed price). Only two other countries had additional goods in stock – Country A 1 (2,000 €) and C 1 (1,100 €). The rest of the groups conformed to rule 7. For comparision, in our second trial simulation (winter 2003) the only country A won with a wealth of 27,550 € followed by the two B countries. Country C 2 lost with 19,950 € - so the spread/range of accumulated wealth was less than in our classroom experiment of spring 2004.

[25] Aid from the World Bank: (1) pencil – 5 minutes: 165 €; (2) pair of scissors – 5 minutes: 285 €; (3) 500 € in cash.

Just like in the real world, it seems to be easier for countries starting with a low(er) income level to achieve higher annual growth rates – in our case also in higher GDP growth per capita, as there was no population growth during the simulation. For all of the three types of countries, there is a perfect correlation between in-type growth rates and respective volumes of production. The lower middle income country B 1 achieved the highest growth rate (7.8 % p.a.), comparing very well to the annual growth of Korea (8.5 %) or China (8.3 %) over the period 1996-2004. The growth rates of the two high income countries – A 1 with 4.0 % and A 2 with 2.5 % - are within the actual range of the US (3.5 %) and Euroland's 2.0% (IMF 2004).

Graph 4 – Export of Goods and Price Fluctuations



Total of 335 goods sold to World Bank

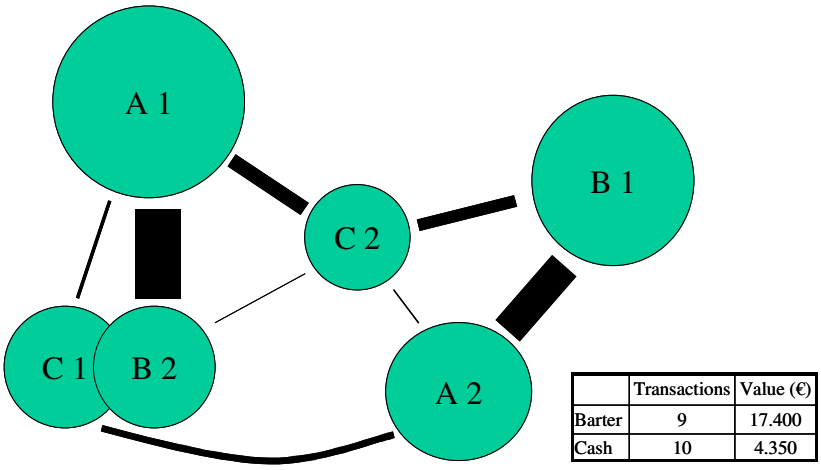
Drop in Prices (- 50 €) every 10 goods; after five minutes reset of price

A total of 373 different shapes were produced and 335 were exported to the World Bank. Due to quality control 15 more were declared waste by the World Bank.[26] As you can see from graph 4, almost two-thirds of all shapes sold were rectangles. This had two consequences: (1) Price fluctuations of this export good were volatile – at one point in time, its price dropped even to zero Euros.[27] (2) Its average price was less than half of its initial value of 300 €; e.g. the mean price was at 137 € per rectangle, the median price was 150 €. For all other shapes

[26] In the first half hour, quality control by the World Bank was relatively strict. As exporters queued up infront of the World Bank desk, quality checks became more lenient.
[27] The standard deviation stands at 85 €.

the median price remained at their initial value.[28] It surprised us that the producers did not refine their rectangle products into set-square sizes as the latter were worth more and their price was more stable. Instead of adjusting their production most groups withheld their sales of rectangle products to a point in time, when prices had climbed up again.[29] Nevertheless, at the end of the simulation one Lower Middle Income country switched to the production of circles.

Graph 5 – Inter-regional Trade



	Transactions	Value (€)
Barter	9	17.400
Cash	10	4.350

Finally, we will take a look at the world trade system concerning all other transactions that took place between the six countries. The size of the countries in graph 5 is proportional to the accumulated value of their exports to world markets. It gives the students the opportunity to compare their world trade system with the real world of merchandise exports in 2002 (see graph 1). Based on 19 transactions valued at a total of 21.750 €, the intensity of trading relationships are reflected in the width of the connecting bars between the different countries. Most of the transactions (in value) were barter trade, all the smaller ones were in cash.[30]

[28] Mean prices (s.d.) were as follows: triangle 7cm at 138 € (28 €); full circle at 484 € (29 €) and set-square at 190 € (27 €). In relative terms, the price of triangle 7 cm dropped further and was more volatile.
[29] During the classroom discussion that followed the presentation of results, one student mentioned economies of scale as a reason not to switch production lines.
[30] For examples on barter trade, one could refer to the oil-for-food program (Irak-United Nations) or the natural gas-for-piplines-deal between German corporations and the former Soviet Union during the 1980s.

Contrary to the real world, no inter-regional trade evolved during the experiment; all of the trade relationships were between countries of different income levels. Due to their resource endowments, transactions between the industrial countries, which only lacked natural resources, could not have been expected. However, the similarity of resource endowments is definitely not an argument for the missing intra-regional trade for Low(er) (Middle) Income countries.[31] Based on the classroom discussion, our world trade system evolved mainly along the lines of David Ricardo's idea of comparative advantage and not on the ones of economies of scale and imperfect competition (e.g. Krugman/Obstfeld 2003). Due to the agreement on an economic union between the countries B 2 and C 1, the transactions between them were not taken into account in graph 5.[32]

4. Applicability of the World Trade System as a Classroom Experiment

By extending the Trading Game of Christian Aid (2002) we developed a classroom experiment that engages students in production and trading activities, for which one always finds an equivalent in the real world of international economics and politics. The participants were asked to role play different country groups from industrial countries to Lower Middle Income and Low Income countries depending on their resource endowments. Each country manufactured "products" from raw materials, for which certain labor and capital inputs were required. These products were sold to the World Bank – representing consumer interests. Each country aimed to maximize its wealth within the simulation period of 75 minutes.

The follow-up classroom discussion on results & outcomes as well as on the various complex trading relationships that evolved during the simulation is crucial for the value added of the experiment to economics or business majors. These discussions are usually very lively as the

[31] In the two trial sessions we did see a few transactions between countries of the same income level.
[32] Since there was only very crude documentation on these intra-country non-valued transactions, we could not assess the extent of them anyway.

game leads to the controversy of unfairness in the allocation of resources as well as the unequalness of trading relationships between developed and less developed countries. On the other hand, our experiment also came up with a very fair trade arrangement: the formation of an **economic union** based on the division of labor where both countries specialized in certain manufacturing tasks (economies of scale) and sharing all of their earnings equally. Another form of taking advantage of cheap or abundant labor was undertaken by one industrial country that sourced part of its production and sales activities out to Low Income countries. Surprisingly, **price fluctuations** induced only few changes in manufacturing - instead, it lead to major variations in the level of stocks. Comparing the actual world trade relationships of graph 1 with the ones of our experiment (graph 5), the lack of **intra-regional trade** was striking. Exploring the **morality** of trade relationships or human behaviour, our classroom discussion brought to light – industrial espionage as well as gender discrimination.[33] Neither of which the organizers of the simulation were aware off! During the reflection period, we also discussed activities that we had not seen, e.g. imposing tariffs, forming a producer cartel or enforcing trade embargos.

In our experiment industrial countries do have a comparative advantage of profiting most –in absolute, but not in relative terms - through the international trade system. Though, in the end, the rise and fall of nations depends on a country's individual "management": just like the real world!

[33] One industrial country (A 2) consisted of two female students, which claimed discrimination by the all men World Bank: the bankers refused to accept various product shapes due to poor quality. But, when the same shapes were offered to them by a member of a Low Income country, the banker accepted them. Another example of unfairness: in the trial session of winter 2003 one group sold bad quality products that had been rebuffed by the World Bank to other countries.

References

Aninat, E. (2002) Surmounting the Challenges of Globalization, Finance and Development Vol. 39 No. 1 (March) 4-7

Basu, K. (2003) Globalization and the Politics of International Finance: The Stiglitz Verdict, Journal of Economic Literature Vol. XLI (September) 885-899

Bhagwati, J.; Srinivasan, T.N. (2002) Trade and Poverty in the Poor Countries, American Economic Review Vol. 92 No. 2 (May) 180-183

Burnside, C.; Dollar, D. (2004) Aid, Policies, and Growth: Reply, American Economic Review Vol. 94 No. 3 (June) 781-784

Christian Aid (2002) The Trading Game, London; German version: Das World Trading Game, TU Darmstadt 1996 (www.tu-darmstadt.de/hjd/didaktik/trading.html)

Dollar, D,; Kraay, A. (2002) Response, Finance and Development Vol. 39 No. 1 (March) 27-28

Easterly, W.; Ross, L.; Roodman, D. (2004) Aid, Policies and Growth: Comment, American Economic Review Vol. 94 No. 3 (June) 774-780

Economist (2004) World trade, Now harvest it, Finance and Economics (August 7th 2004) 59-60

Edwards, S. (2004) Financial Openness, Sudden Stops, and Current-Account Reversals, American Economic Review Vol. 94 No. 2 (May) 59-64

Fischer, S. (2003) Globalization and Its Challenges, American Economic Review Vol. 93 No. 2 (May) 1-30

Frankel, J.; Romer, D. (1999) Does Trade Cause Growth?, American Economic Review Vol. 89 No. 3 (June) 379-399

Häusler, G. (2002) The Globalization of Finance, Finance and Development Vol. 39 No. 1 (March) 10-12

IMF (2004) World Economic Outlook September 2004, The Global Demographic Transition, International Monetary Fund, Washington D.C.

Koopmann, G.; Franzmeyer, F. (2003) Weltwirtschaft und internationale Arbeitsteilung, Informationen zur politischen Bildung (3. Quartal) 12-26

Krugman, P.R.; Obstfeld, M. (2003) International Economics: Theory and Policy, sixth edition, Addison Wesley Boston

Peterson, B.; Wallace, S. (2002) When the Classroom Mimics Reality: A Simulation in International Trade and Relations, SSRN Electronic Paper Collection

Piazolo, M. (1994) Bestimmungsfaktoren des wirtschaftlichen Wachstums von Entwicklungsländern – mit besonderer Berücksichtigung der Außenhandelsstrategie. Fallbeispiele: Korea und Südafrika, Duncker & Humblot Berlin

Piazolo, M. (2005) World Trade System, A Computer Simulation, LumosMedia GmbH, Zweibrücken

Ratha, D. (2004) Why should we care about workers' remittances? And what should we do? Note presented at the Expert Meeting of the Global Commission on International Migration, January 20-21 2004

Reinert, K.A. (2004) What Sort of Global Education? Towards a Modification of International Economics Instruction, George Mason University, paper presented at the Sixth Annual Economics and the Classroom Conference, Jackson Lake Lodge, September 17 2004

Stiglitz, J. (2002) Die Schatten der Globalisierung, Siedler Verlag Berlin

Tabatt, C.; Ulukaradag, M. (2004) Das World Trading Game, seminar paper, University of Applied Sciences Kaiserslautern, mimeo.

Taylor, A.M. (2004) Global Finance: Past and Present, Finance and Development Vol. 41 No. 1 (March) 28-31

Watkins, K. (2002) Making Globalization Work for the Poor, Finance and Development Vol. 39 No. 1 (March) 24-27
World Bank (2003) World Development Indicators 2003, Washington D.C.
WTO (2004) International Trade Statistics 2003, World Trade Organization, Geneva

Appendix 1 – Organizational Topics

1.	Classroom has to be large enough for seven groups of 2-4(6) students each. Leave enough circulation space between the six countries and especially in front of the World Bank desk, where producers will line up during the game. It takes about 10 minutes to prepare the classroom for the experiment.
2.	Each country gets two desks and chairs as many as its members.
3.	The World Bank gets two desks, an overhead projector (beamer) to publish news and a blackboard /or beamer) for the price listings.
4.	Each group gets a documentation sheet to register all transactions and agreements with other countries or the World Bank. They receive a ballpen which they are not allowed to use for drawing shapes!
5.	Members of each group get a badge of their country for identification purposes.