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THE OCCURANCE AND THEORETICAL ASPECTS OF MICROFINANCE

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Abstract

Micro-lending is a financial instrument for providing small loans and other financial services (such as micro-savings and micro-insurance) for the poor segments of the population for the purpose of self-employment or to start-up their own businesses. This method enables them and their families to be employed and economically independent. To better understand the concept of micro-lending in a scientific sense, it is necessary to investigate the circumstances and factors that have created the occurrence of this form of financing. The research in this paper starts from Bangladesh which is considered to be the "cradle of microfinance" in the world. Although there are differences between the countries that have developed microfinance such as population, culture, history, geographical features, economic development etc., there are also significant similarities. The main objective of this study is to determine whether there is a common pattern and to define the corresponding moment of socio-economic development that affects the initiation and development of microfinance in the countries that are the subject of this research. The research question is: What are circumstances that caused the occurrence of micro-lending, with a focus on Bangladesh and other countries where micro-lending developed? The hypothesis proved in the paper is: Microfinance occurs in countries that have high levels of poverty and low level of economic development. The comparative method is used to prove the hypothesis.

***Keywords*:** Microfinance, Poverty, Loans, Microcredit

JEL Classification: O16, G21, D21, I32

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Introduction

In the last two decades, the rapid development of the economy, increased competition, and technological changes that have taken place in all economic areas have resulted in changing economic practices, first in the most developed countries and then in developing countries. Under the influence of global trends, the focus has shifted from industrial to environmental industries, also, information has also become a basic resource, and the most profitable industries are those in which knowledge is more important than capital. At the same time, important international institutions that monitor and assist these processes in developing countries, such as the World Bank, the International Monetary Fund and others, have begun to insist on national governments being directly involved and responsible for the reduction of poverty, the social exclusion of individuals, the inclusion of minorities into mainstream economic activities, and in connection therewith, the elimination of social differences.

The great economic crisis that befell Europe and the world in 2007 has now quite certainly proved to have greatly worsened the position of citizens, especially individuals who before the crisis belonged to the most vulnerable. Their earnings have decreased, and many have fallen into the impossibility of regularly repaying their bank debts. On the other hand, jobs have become uncertain, and in recent years a very high unemployment rate has been recorded, especially, among the young. The main problem that is associated with unemployment is the called "financial exclusion" – i.e. the lack of access to basic banking services, which can contribute to the implementation of good business ideas. All of the situations mentioned above have emphasized the acute need for alternative sources of financing for small businesses, which has placed in the foreground the issue of micro-lending which has been the focus of intense interest to the business community for more than 40 years.

The United Nations in December 1995 launched a program called Microcredit[1], which was aimed at reducing poverty in the most vulnerable parts of society. This program was presented as an introductory and motivational factor for better understanding the concept of microfinance, and to encourage a greater interest in this topic in scientific circles. The World Summit of Micro-crediting in February 1997, gave us the first official definition of micro-lending: a micro-program granting small loans to very poor people for self-employment projects that provide an income and self-determination of existence for individuals and their families. At the same time, the World Bank has established a special agency that monitors trends and issues manuals and rules for the efficient performance of micro-lending (CGAP - Consultative Group to Assist the Poorest). Micro-lending is defined as offering loans, savings, and other basic financial services to the poor.[2]

Bangladesh is considered to be the first country in the world that has successfully established microfinance. The idea of microfinance emerged after Bangladesh achieved its independence from Pakistan in 1971. Professor Muhammad Yunus from Bangladesh is the first pioneer of microfinance in the world.[3] He started the project by granting small loans with the goal of helping the poor to invest funds in a business idea which they were convinced would succeed. As a result of this experimental project, micro-lending is available today in many countries around the world and provides unobstructed access to financial services for the poorest segments of the population. It took more than 20 years for the concept of micro-crediting to develop and expand to other countries.

[1] The Assembly of the United Nations Resolution 50/107, December 20, 1995, "First United Nations Decade for the Eradication of Poverty (1997-2006). Resolution 51/178, 16 December 1996, confirming the importance of microcredit and Global Microcredit summit held in 1997 where the plans and objectives for the coming period were defined.

[2] For more information, see CGAP (Consultative Group to Assist the Poorest) / The World Bank Group, 2009 http://www.cgap.org/

[3] Muhammad Yunus was born on 28 June 1940. He is a professor, economist, and banker from Bangladesh. During 1983, he founded the "Grameen Bank" which approved loans to the poorest segments of the population to start businesses. Prof. Muhammad Yunus is considered to be the creator of the concept of microcredit microfinance in the world. This concept then spread to many countries around the world. He was the recipient of the Nobel Peace Prize in 2006.

The main task of this paper is to investigate the circumstances that caused the occurrence of micro-lending, with a focus on Bangladesh and other countries where micro-lending developed.

Besides Bangladesh, this paper provides a detailed analysis of case studies of Bosnia and Herzegovina and Montenegro and provides an overview of the circumstances that caused the occurrence of microfinance in these countries. These countries are the objects of this detailed analysis because in the region Bosnia and Herzegovina and Montenegro are the countries where microfinance is most developed.

The first part deals with the occurrence and the theoretical framework of microfinance. The second part discusses the factors that caused the occurrence of micro-lending in Bangladesh and other countries with developed microfinance. Additionally, the paper analyses the relationship between microfinance and the banking sector in the case studies countries.

The hypothesis proved in the paper is: Microfinance occurs in countries that have high levels of poverty and low level of economic development.

1. The Occurrence and theories of microfinance

Although microfinance has experienced success in the past 40 years, we cannot ignore the fact, which its first form, microfinance was created with the establishment of the Irish credit fund, in 1720. This institution granted small loans and proved that such lending could be financially self-sufficient and profitable.[4] Hans Dieter Seibel[5] has noted that after nearly a century since its founding an intensive development of this type

[4] For more information, see CGAP (Consultative Group to Assist the Poorest) / The World Bank Group, 2009, http://www.cgap.org/

[5] Hans Dieter Seibel is a German author who writes about microfinance. He has written several research papers about financial services for poor entrepreneurs.

of lending in Ireland has initiated the following two events (Seibel, 2003, p.10):

a) In the year 1823, a law was passed that allowed the approval of small loans with an appropriate interest rate,

b) In the year 1836, a committee was established with the expressed goal of regulating and monitoring the Irish fund.

Another country that can be commended for granting small loans is Germany, where even as early as 1778, the authority responsible for banking and finance was involved in the institution, the control, and the supervision of microfinance in Germany.[6]

Two important economists who have dedicated their lives to the idea that the market economy and the loans are not the problems but the key solutions. One is Hernando de Soto, who discovered reason why loans are not favorable to entrepreneurship in poor countries: "The lack of legal property thus explains why citizens in developing and former communist nations cannot make profitable contracts with strangers, cannot get credit, insurance, or utility services: They have no property to lose" (Soto, 2000, p.55).

The whole idea of "microcredit" is the result of a successful experimental enterprise which took place in the village of Jobra in Bangladesh in 1970, and was conducted by Prof. Mohammad Yunus (Yunus, 2009, p.p.20-40). After realizing what was possible to achieve by granting small loans to poor people with solid business ideas, he came up with a new phrase – **microcredit**, which has the following characteristics:

a) Microcredit is granted exclusively to the poorest segment of the population,

[6] For more information, see CGAP (Consultative Group to Assist the Poorest) / The World Bank Group, 2009, http://www.cgap.org/

b) A microcredit loan is not a consumer loan. i.e. used to buy consumer goods; but rather a small loan used to finance the development of entrepreneurship,

c) Together with microcredit comes an advisory component. Debtors are trained by a loan officer in regards to how to transform their entrepreneurial idea into a successful business activity.

In 1976, Prof. Muhammad Yunus founded the "Grameen Bank" in Bangladesh, which has since then approved over US$ 5 bn in small loans for about 5 million people.

Consequently, it is not a surprise that microfinance in the world is most represented in underdevelopment countries. Its primary goal is to reduce the gap between the poor who do not have access to bank and financial services to help them to set up a business, and the other more wealthy segments of the population who have access to these services.

Apart from authors who have researched the positive aspects of microfinance, there are other authors who have focused on the negative aspects of microfinance. Milford Bateman, Professor of Economist, has played an important role in criticizing microfinance (Bateman, 2010, p.p.1-5). He has analyzed the negative side of microcredit. Bateman has emphasized that proponents of microfinance argue that microfinance is crucial for the poor people in developing countries, creating new jobs while increasing their income, with special attention to women in businesses, which is according to Bateman incorrect. He argues that the "popularity" of microfinance is owed mainly to Prof. Muhammad Yunus, who due to his personal vision and reputation has managed to convince most people who are currently active on the relevant international economic scene to support his efforts (Bateman, 2010, p.p.1-5).

The main argument which Bateman developed in the book is that microfinance is largely contrary to the concept of sustainable economic and social development, and poverty reduction. He says: "Put simply,

microfinance does not work." The benefits of microfinance are insignificant compared to the huge long-term negative consequences and opportunity costs (Bateman, 2010, p.p.1-5). Also, this author believes that the increasing commercialization of microfinance is the main problem which was the cause of the destructive microfinance models in the 1990s. Since then, in his view, microfinance institutions have been oriented towards business, with the primary goal of achieving full financial sustainability and profitability, despite the fact that poor people and their projects can receive significant benefits and additional income from low interest rates. Also, he firmly believes that in any case, with a better conjunction with state structures, poor people can achieve much better results than what is currently achieved by microfinance (Bateman, 2010, p.p.1-5).

Milford Bateman's controversial opinions have produced many debates and discussions on this topic, especially with the well-known theorist of microfinance such as David Roodman. In fact, David Roodman concludes that microfinance cannot continue to live on its popular image and that it is impossible that at the same time 150 million poor people (i.e. the customers of microfinance) have all made the wrong decision (Roodman, 2012, p.5).

In addition, David Roodman on his Microfinance Open Book Blog in August 2010[7], while discussing, Milford Bateman's new book, *Why Doesn't Microfinance Work? The Destructive Rise of Local Neoliberalism* explains the first beginnings of microfinance in Ireland, Germany, and Indonesia. Roodman points out that microfinance institution, as claimed by Bateman, were not established by donors or NGOs and their drivers are not neoliberals.[8] Also, he highlights that all these microfinance institutions have a common factor of solidarity, in

[7] Center for Global Development, Independent research & practical ideas for global prosperity, David Roodman's Microfinance Open Book Blog http://blogs.cgdev.org/open_book/2010/08/why-doesnt-milford-batemans-book-work.php
[8] Ibid.

that they did not give subventions by donors and they have been able to be profitable.[9]

2. Idea and purpose of microfinance

With the development of entrepreneurship, microfinance has occurred as an answer to the need for financial institutions to respond to the growing needs for financing small and relatively risky businesses.

There are three categories of citizens who cannot get a bank loan:

1) The unemployed who have never been employed - a category of the population that is not creditworthy,

2) The unemployed who were once employed, but have lost their job due to privatization, financial crisis, etc.

3) All the others who do not have a stable financial income and who cannot offer adequate guarantees to serve as collateral for obtaining loans in banks. They are considered to be too risky to get a loan from a bank.

Microcredit is not a consumer loan; it is designed for investment in fixed assets and working capital. It can be obtained in a short period, and usually it is repaid by fixed annuities in several installments. Due to the huge number of small loans that require extensive processing time, microfinance institutions have high administrative costs which are a cause of high interest rates on small loans. High administrative costs are caused by the high costs of monitoring and following -up entrepreneurs. The second reason for high interest rates is high-risk clients. Credit decisions are not based on an automated system of evaluating loan applications and a scoring system (as exist in the banking sector).

[9] Ibid.

Consequently, good credit decision requires significant intervention from loan officers in assessing credit risk. The next factor which influences high interest rates on loans is clients who are mainly from geographically isolated and rural areas. Specifically, microfinance institutions often operate in remote and rural areas which have low population density, which further increases the costs per loan and makes loans expensive.

The main micro products which were launched together with the idea of microfinance in Bangladesh are:

1) Individual loans for women in business. These are loans that are used to finance women's business ideas,

2) Group loans. Their main characteristic is to lend money to individuals who are organized in groups. This product has two characteristics:

    - Social collateral: If any member of this group is late with their loan repayment, nobody else in the group can get a loan again. This condition creates social pressure where each borrower is forced not to be late with repayment of their loan.

    - Cooperation: If any member of this group is faced with some difficulty in repaying their loan, another person in the group will repay the loan on their behalf because they have a mutual trust. It strengthens the group which fully protects the interests of microfinance institutions (Khan and Rahaman, 2007).

Demand for microcredit is, at this point on a global level, significantly higher than the supply (Shaohua and Martin, 2004). In order to reduce the gap between demand and supply, it is necessary to increase the capacity of the existing microfinance institutions or establish new institutions. The gap is constantly increasing and there is a need for more than an additional US$ 300 bn of loans in order to meet the demand for microcredit loans (Unger and Hieminga, 2012, p.30).

The European Commission through funds, such as the European Investment Fund, provides financial support for micro SME customers, depending on the stage of an accession of the existing and prospective members of the European Union (EU).

3. Differences between countries in which microfinance occurs

In the Balkan region, Bosnia and Herzegovina and Montenegro are the countries where microfinance is most developed.[10] This paper analyzes case studies of Bangladesh, Bosnia and Herzegovina and Montenegro, and gives an overview of the circumstances that caused the occurrence of microfinance in these countries.

The first impression is that among these countries there are no similarities, and only significant differences such as population, size, culture, history, and level of economic development. An example in regards to population, Bangladesh has 155 million people; Montenegro has 621 thousand, while Bosnia-Herzegovina has 3.83 million people. Additionally, Bangladesh is a country with much lower levels of economic development compared to Montenegro and Bosnia and Herzegovina. At the end of 2012, the GDP per capita in Montenegro was higher by 9.5 times compared to Bangladesh and 58% higher in relation to Bosnia and Herzegovina. The Gross National Income (GNI) per capita in Montenegro is 8.9 times higher than in Bangladesh and 32% higher than in Bosnia and Herzegovina.[11] On the other hand, the average amount of microcredit in Montenegro is almost 11 times higher than in Bangladesh.

[10] See Appendix 1: Development of Micro-lending in the World

[11] The World Bank, World Development Indicators (2012) http://data.worldbank.org . GDP in Montenegro was US$ 7,253, Bosnia and Herzegovina US$ 4,754, while in Bangladesh US$ 732. GNI in Montenegro was US$ 7,011, Bosnia and Herzegovina US$ 5,301 while in Bangladesh $ 788. The GNI coefficient prefers the MIX Market.

If one takes into account the average amount of loans relative to the GNI, as an important indicator[12] of comparison in accordance with the recommendations of the MIX market[13], we get a comparison of micro-lending in countries, despite them having large differences. The following table shows the average amount of microcredit and GNI per capita in Bangladesh, Bosnia and Herzegovina, Montenegro, Russia, India, and Indonesia.

Table 1: Average Loan per Borrower and GNI Per Capita

Country	**Average loan balance per borrower (ALPB)**	**GNI per capita in US$ (GNIPC)**	**Average loan balance per borrower / GNI per capita**
Bangladesh	160	753	21.24%
Bosnia and Herzegovina	1,416	4,760	29.75%
Montenegro	1,712	6,988	24.50%
Russia	2,144	10,388	20.64%
India	163	1,486	10.97%
Indonesia	133	2,910	4.57%

[12] The Mix Market uses this indicator for the comparison of the development of microfinance between different countries. Further, in this research paper, an interpretation of this indicator has been given.
[13] One of the best known global microfinance networks in the world "Microfinance Information Exchange" i.e. MIX Market.

Source (1): Data refers to 2012. Microfinance Information Exchange, 2012, http://www.themix.org/publications/microbanking-bulletin/2011/10/2010-mfi-benchmarks. For Montenegro, it refers to two Micro Finance Institutions (MFIs) and **Source (2)**: World Bank: http://data.worldbank.org/ [Table Data processed by the research paper author.]

By looking at the table above, we can see that for Bangladesh, Bosnia and Herzegovina, Montenegro, and Russia, the indicator "average loan per borrower / GNI per capita" is on a similar level, i.e. in ranges from 20.6% in Bangladesh to 29.7% in Bosnia and Herzegovina. In India and Indonesia, the ALPB / GNIPC indicator is at a lower level and ranges up to 11%. This ratio shows the average share of microcredit in average earnings of the residents living in the countries analyzed. This suggests that despite differences between countries (population, culture, history, economic development, etc.) micro-lending in these countries is comparable and among them there are similarities. **In fact, the average borrower of microcredit to generate a US$ 100 Gross National Income borrows US$ 21.24 in Bangladesh, US$ 29.75 to US$ 24.50 in Bosnia and Montenegro, which they used to buy fixed assets or working capital to setup a new business or expand an existing one.**

In the next chapter, which explores the circumstances that caused the occurrence of microfinance we will be looking for similarities and factors that have influenced micro-lending in the countries that have been compared in the table above.

4. The socio-economic factors which had an influence on the initiation and development of microfinance in Bangladesh

Bangladesh is considered to be the first country in the world which established microfinance. More than half of the population lives below the poverty line, and earn less than US$ 1 per day. The GDP per capita in the years when microfinance first occurred amounted to only US$ 136 in 1970, while in 2011 it amounted to US$ 732.

The remainder of this paper identifies the main specificities of the socio-economic environment that caused the appearance of microfinance[14]:

1) **Conflict situations, i.e. the period of the Bangladesh war for independence;**

   As a result of economic discrimination and West Pakistan's political domination of East Pakistan (now Bangladesh), East Pakistan began the struggle for independence waging a war that lasted for nine months[15] and declared independence on 26 March 1971. The idea of microfinance emerged after the war, i.e. in conditions when Bangladesh had been severely damaged by the war, and several million people received refugee status (Rahman, 2013, p.1).

2) **Poverty is very pronounced;**

   A Number of people living with an income below US$ 2 per day, compared to the total population of Bangladesh in 1984 was as high as 90.5% (83 million people).[16] Unemployment in Bangladesh has always been one of the biggest problems.[17] The Human Development Index (HDI) ranks Bangladesh at the146th place in the world, out of 186 countries.[18] Poverty and overcrowding have forced many to start their lives in other places, i.e. in unstable and insecure areas of the

[14] The World Bank, World Development Indicators, http://data.worldbank.org/indicator/NY.GDP.PCAP.CD
[15] In December 1971, Bangladesh with the support of India defeated West Pakistan and since then officially considered to be gained independence.
[16] It was measured in 1984 for the first time.
[17] According to official data published by the World Bank, the unemployment rate was around 4.5% at the end of 2012 and 1.8% in 1984, when it was first measured. For more information, see The World Bank: http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS/ ; The Global Economy: http://www.theglobaleconomy.com/Bangladesh/indicator-SL.UEM.TOTL.ZS/). However, unemployment was estimated at 40% or 30 million people. One of the main reasons these indicators vary is that the employees are considered as people who work a few hours a week with low wages. For more information see CIA World Factbook: https://www.cia.gov/library/publications/the-world-factbook/fields/2129.html. and Academia.edu: http://www.academia.edu/859072/Unemployment_Problem_in_Bangladesh
[18] UNDP (United Nations Development Program), with the International Human Development (IHD) indicators for 2013, http://hdrstats.undp.org/en/countries/profiles/BGD.html

country, but with better job opportunities. In the years when microfinance first appeared the majority of the populations were of working age but still unemployed. They had no income or other types of collateral that could have been used as a guarantee for obtainingloans from banks, which would have been used to create a business activity.

3) Unstable economic and political conditions followed by military intervention;

From 1975 to 1991 in Bangladesh experienced frequent military interventions during changes of government, which is usually reflected through the introduction of a state of emergency in the country.

4) Mostly rural population;

Bangladesh is one of the most densely populated countries in the world.[19] Population density in 2011 was 1,174 inhabitants per square kilometer and in the period from 1961 to 2011 the population increased more than 3 times. For the purpose of comparison, in Montenegro, the population density was 46.14 while in Bosnia and Herzegovina it was 75.28 inhabitants per square kilometer. The Bangladesh population lives mainly in rural areas and is primarily orientated towards agricultural production. In 1960, as many as 95% of the total population lived in rural areas, compared to the percentage in the year 2012, when rural population dropped to 71% (110 million). Although the number of the rural population has more than doubled in the studied period from 1961 to 2012, the rate of population growth from year to year has constantly decreased.[20]

[19] By population density of Bangladesh occupies eighth place in the world. The World Bank: http://databank.worldbank.org/data/views/reports/tableview.aspx#

[20] The World Bank, World Development Indicators (2012), http://data.worldbank.org/country/bangladesh#cp_fin

5) Weak education system and a high percentage of illiterate population;

In the period from 2001 to 2006, the average investment in education accounted for about 2.2% of the GDP.[21] This indicator in Montenegro is 4.5%. In 1981, only 29% of the population over 15 years was literate (Rahman and Yusuf, 2011).

6) Poorly developed banking system;

After the war for independence, in 1971, the banking financial system was poorly developed. The banks were state-owned, and their main purpose was to give money to sectors (primarily state companies) that were supposed to speed up the reconstruction of the heavily damaged country. Expansion loans with conditions that were not stipulated according to the real market and were granted without adequate risk assessment caused a delay of loans and the bad bank management. The Bangladesh banking sector was dominated by four state-owned banks known as the "Nationalized Bank (NCB)," which controlled close to half of the total assets in the banking system.[22] Bangladesh banks had not considered having the poor segment as their clients because they represent a high credit risk, do not have stable income managed through banks and do not have adequate collateral, which could serve as a loan guarantee.

7) Very low level of economic development;

At the moment of the creation of microfinance, in Bangladesh economic development was at a very low level. The GDP per capita was at a very low level, and in 1971 it amounted to US$ 129 whereas in 2012 it was US$ 747. This shows that the rate of GDP growth was

[21] For example, at the end of 2010, investment in education in Germany is 5%, and in Austria 5.9%. For more information, see http://databank.worldbank.org.

[22] The World Bank, World Development Indicators (2012), http://data.worldbank.org/country/bangladesh#cp_fin

absorbed by the rate of population growth that also increased.[23] At the end of 2010, approximately 80 million people in Bangladesh did not have access to electricity. This indicator, even though it, shows a very low level of economic development, also demonstrates that Bangladesh has great potential for economic growth in the future.

8) Low level of economic freedom;

According to data from the Heritage Foundation, in the last 19 years, the Index of Economic Freedom has not experienced any major fluctuations. Namely, in 1996, when they introduced the first measurement of economic freedom in Bangladesh, this indicator was 51.1, which then ranked Bangladesh at the 98th place in the world. At this time the world average was 57.1. In 2013, the Index of Economic Freedom was 52.6, ranking this country at the 132nd place in the world.[24] These indicators classified Bangladesh in the group of the poorest countries in the world with weak public institutions and strong state intervention that led to corruption. Consequently, it can be assumed that at the time of the occurrence of microfinance, economic freedom was at a low level.

5. Interdependence between microfinance, economic development, and poverty in the world

Although there are large differences between countries in which microfinance occurred such as economic development, poverty, culture, history, etc., the goal of this study is to determine whether there is an interdependence between microfinance and economic development on the one hand and interdependence between microfinance and poverty on

[23] In the period from 1971 to 2012, the population increased by 129% (87 million) while the GDP per capita increased by 477%. The World Bank, World Development Indicators (2012), http://data.worldbank.org/country/bangladesh#cp_fin

[24] Heritage Foundation, 2013 Index Economic Freedom, www.heritage.org, graphics and historical trends can be seen in http://www.heritage.org/index/visualize#

the other hand. Consequently, if there is interdependence, then a discernible pattern still needs to be identified.

By the data obtained from the international institutions which research microfinance[25] (Mix Market, CGAP, Microfinance Centre), microfinance has not developed in countries with high levels of economic growth measured by GDP per capita. Accordingly, the subjects of this research are the countries where microfinance has been developed.[26]

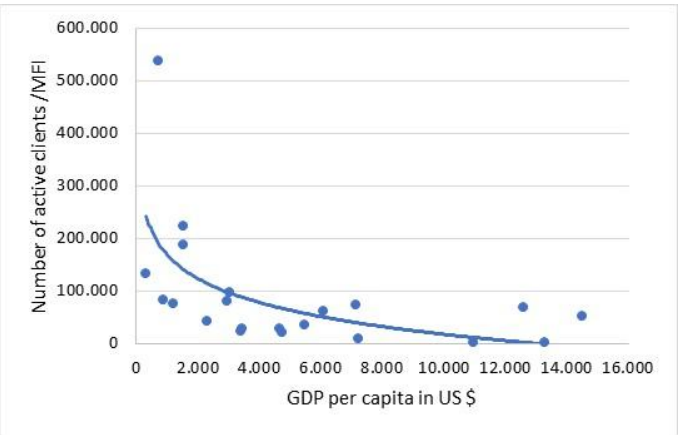
To determine the interdependence between microfinance, economic development, and poverty, the following indicators are used: the number of active borrowers per microfinance institution[27], the GDP per capita and the poverty rate[28]. The following graph shows the interdependence between microfinance and economic development **(Graph 1):**

[25] See data: MIX market : http://www.mixmarket.org/; CGAP-a: http://www.cgap.org/; Microfinance Centre: www.mfc.org.pl/;
- MIX market on a monthly basis collects, systematizes, and publishes financial data for microfinance institutions located worldwide.
- How the microfinance model was successful during the last financial economic crisis, it has stimulated the interest in education and research by universities and institutions in developing countries as to the possibility of also applying this model used by underdeveloped and poor countries to developed countries. Examples are the University at Albany, the State University of New York, UN Capital Development Fund Partners with SUNY Institutions to Expand Education on Microfinance, European Investment Fund, and KIVA (the non-profit organization in USA).

[26] See Appendix 1.

[27] Active borrowers are clients who at the reporting date have not paid their loan, i.e. they have a debt to microfinance institutions. Additional indicators of the development of microfinance in one country can be used such as the number of active loans or loan portfolio per microfinance institution.

[28] The poverty rate was determined by using the Poverty headcount ratio at US$2 a day (PPP) (% of population)

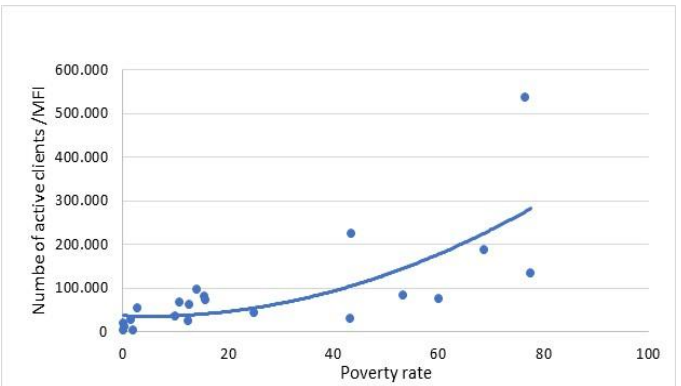


Graph 1: Interdependence between microfinance and economic development

Source (1): MIX market, http://www.mixmarket.org/ [Data processed by the research paper author] **Source (2):** World Bank: http://data.worldbank.org/ [Data processed by the research paper author]. See Annex 1

From the graphics, it can be seen that microfinance occurs in countries with low levels of economic development. In addition, there is regularity between these two occurrences, i.e. a negative correlation exists between microfinance and economic development. With decreasing GDP per capita, the number of active borrowers per microfinance institution grows and vice versa. It can be concluded that in countries with a lower level of economic development, microfinance is more developed, while in countries with higher levels of economic development, microfinance is undeveloped.

Interdependence between microfinance and poverty shows the following graphic **(Graph 2):**



Graph 2: Interdependence between microfinance and poverty

Source (1): MIX market, http://www.mixmarket.org/ [Data processed by the research paper author] **Source (2):** World Bank: http://data.worldbank.org/ [Data processed by the research paper author]. See Annex 1

Microfinance occurs in countries with higher levels of poverty. There is a positive correlation between microfinance and poverty. With increasing rates of poverty, the number of active clients per microfinance institution grows and vice versa**.** This refers to countries where poverty is more pronounced microfinance is more developed, while in the less poor countries, microfinance is less developed.

6. The circumstances that caused the occurrence of microfinance in Bosnia and Herzegovina and Montenegro

Although Serbia is a country in development, microfinance in Serbia has not been developed. One of the main reasons is the lack of adequate regulations by the National Bank of Serbia, which should define and establish the normal functioning of microfinance institutions. In regards to neighboring countries, microfinance is most developed in Bosnia and Herzegovina. In this country, microfinance occurred after the war ended in 1995. After the termination of this war, Bosnia and Herzegovina was faced with two problems:

1) How to rebuild the country's infrastructure;

2) How to implement market reforms in the economy.

Similar to Bangladesh, in Bosnia and Herzegovina there were socio-economic characteristics which caused the occurrence of microfinance which is as follows:

1) **Conflict situation, i.e. Period of War**; [29]

2) **High unemployment**;

   It is estimated that in 1998 the unemployment rate in Bosnia and Herzegovina was 70% - 80% (Hukic, 2002).

3) **Expressed poverty**;

   More than 60% of the population after the war lived below the poverty line (Hukic, 2002).

[29] With the end of the war and the signing of the Dayton Agreement in 1995, a very large number of factories and homes had been destroyed, and micro-entrepreneurs, for the most part, were returning from the war, i.e. demobilized soldiers who before the war had been workers in factories

4) Low level of economic development;

In 1997, the first year of microfinance in Bosnia and Herzegovina, the GDP per capita was US$ 1,038. However, by the end of 2011, the GDP per capita amounted to US$ 4,754.[30]

5) Donations;

Microfinance institutions originally were created in the form of non-governmental organizations with the aim of providing assistance to the most vulnerable parts of the population. After 1995, the microfinance sector grew rapidly, transforming itself from institutions that received grants in sustainable microfinance institutions.

6) Poorly developed banking system in state-owned banks

7) Unstable economic and political conditions;

After the war, the Dayton Agreement in 1995 defined the relations of the constituent nationalities in Bosnia and Herzegovina. However, even today there is no consensus among the national leaders of the different political parties.[31]

8) Low level of economic freedom;

In 1998, when microfinance first occurred in Bosnia and Herzegovina, the Index of Economic Freedom was at a low level and

[30] The World Bank, World Development Indicators (2012) http://data.worldbank.org/country/bosnia-and-herzegovina

[31] EBRD (2013): *Strategy for Bosnia and Hercegovina*, EBRD; http://www.ebrd.com/downloads/country/strategy/bosnia-herzegovina-draft-local.pdf

amounted to 29.4 until the end of 2013 when it was at 57.3. This puts Bosnia and Herzegovina at 103rd place in the world.[32]

Much like in Bosnia and Herzegovina, microfinance in Montenegro is relatively recent. Microfinance institutions in Montenegro are governed by the regulations that were created by the Montenegro government in 1998 which defined the first legal conditions for the functioning of microfinance in Montenegro. The main circumstances that led to the emergence of microfinance are:

1) **Donations**;

Much like in Bosnia and Herzegovina, microfinance institutions were initially created as a non-governmental organization with the aim of providing grants to poor sections of the population, to be later transformed into organizations that grant micro-credits.[33]

[32] The World Bank, World Development Indicator (2012): http://data.worldbank.org/country/bosnia-and-herzegovina

[33] There were three microfinance organizations: a) Opportunity Bank developed by the NGO Microcredit Montenegro in 1999. This bank had very strong support from the United States Agency for International Development (USAID), and during the transformation this bank also had technical support provided by the "Rabobank." An international organization called Opportunity International, using Opportunity Transformation Investments (OTI) is the majority owner of the Opportunity Bank Montenegro with over 75% of the bank's core capital which is approximately € 3 million. Opportunity International in cooperation with the local NGO Microcredit Montenegro offered microcredits to the entire population in Montenegro. NGO Microcredit Montenegro in 2002 was transformed into a bank and they expanded their range of financial services to include traditional services while also continuing to give strong support to micro-entrepreneurs.

b) In 1999, the international organization World Vision founded and established a local non-governmental organization called Agroinvest, with the support of the National Agency for International Development Canada (CIDA), and Sweden (SIDA). Agroinvest offers microcredits to the members of the population who live in the rural areas of central and northern Montenegro. Microcredits from Agroinvest are intended solely for agro-businesses, i.e. agriculture: livestock farming, fruit growing, processing and marketing of agricultural and dairy products and the like. The main goal of creating a microfinance institution likeAgroinvest is to better develop the less modernized regions in Montenegro, as well as improving the conditions of life and work in the countryside.

c) A local Montenegro NGO Alter Modus was founded in 1997 with the financial support of the High Commissioner for Refugees (UNHCR), Church World Service (CWS), the Dutch Agency for International Development Cooperation (NOVIB), American Section of Agriculture (USDA), the European Bank for Reconstruction and development (EBRD), Oikocredit, and other institutions offer microcredits to the total population of Montenegro with great attention given particularly to refugees, displaced persons, and women which represent over 60% of the total loans given by NGO Alter Modus.

2) **Poverty**;

According to the first official study published in 2005, there were 11.2% of the population who were living below the poverty line.[34]

3) **Low level of economic development;**

The GDP per capita in 2000 was US$ 1,610 while in 2011 it was US$ 7,253.[35]

4) **High unemployment;**

In 2005, according to a study, the unemployment rate stood at 30.3%, and in 2012 it had dropped to 19.6%.

5) **Unstable economic and political circumstances before Montenegro became independent;**

6) **Poorly developed banking sector;**

The Central Bank of Montenegro was founded in 2000 and was later followed by a reformation of the banking system and the expansion of commercial banks. Before the reformation, the control of the banking system was not well-organized. In this period there were no foreign-owned banks. Banks were not interested in lending to the poor strata of the population.

[34] The World Bank, *World Development Indicators (2012)*, http://data.worldbank.org/country/montenegro
[35] Ibid.

Conclusion

This paper concludes that microfinance developed in countries with different demographic, economic, social, cultural, political, and historical circumstances. Large differences between countries were aggravating factors in the comparative analysis and proving hypotheses. Nevertheless, micro lending is comparable among different countries, as proved by the Average loan balance per borrower (ALPB) in US$ / GNI per capita. Based on the data obtained by international institutions engaged in researching microfinance in the world, countries with high levels of economic development are not on the list of countries where microfinance has been developed. The results of this study showed that there is a negative interdependence between microfinance and business development. Microfinance is underdeveloped in countries with higher levels of economic development, and vice versa. On the other hand, between microfinance and poverty there is a positive correlation, i.e. in countries with a higher level of poverty, microcredit has developed and vice versa. Also, this paper had identified the common factors of socio-economic development that caused the occurrence of microfinance (statistics in the provided research apply to the period when microfinance first occurred in the considered countries). These factors are high unemployment, post-conflict situations, low levels of economic development, expressed poverty, and donations from international institutions, unstable economic and political conditions, poorly developed banking systems, and low levels of economic freedom.

All these arguments confirm the hypothesis that microfinance occurs in countries that have expressed poverty and low level of economic development.

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Appendices

Appendix 1: Microfinance in the world

Country	Number of MFI	Gross loan portfolio in US$	Number of active borrowers	GDP per capita in US$	Poverty headcount ratio at $2 a day (% of population)	Number of active borrowers/MFI
Argentina	14	26,178,637	31,401	10,952	1.87	2,243
Armenia	13	696,549,113	300,186	3,422	12.43	23,091
Bangladesh	38	1,627,628,179	20,397,678	732	76.54	536,781
Bolivia	24	3,025,855,624	998,991	2,320	24.89	41,625
Bosnia and Herzegovina	12	536,166,681	238,822	4,754	0.19	19,902
Brazil	30	1,825,792,245	2,012,465	12,576	10.82	67,082
Cambodia	17	1,624,491,258	1,385,589	878	53.27	81,505
Chile	5	1,622,372,953	261,649	14,513	2.72	52,330
Colombia	31	5,266,444,942	2,275,136	7,149	15.82	73,391
Dominican Republic	12	646,764,662	403,554	5,493	9.88	33,630
Egypt	11	209,709,677	884,433	2,973	15.43	80,403
Ethiopia	7	191,366,855	928,176	335	77.63	132,597
India	117	3,587,246,055	21,887,497	1,540	68.72	187,073
Indonesia	16	10,069,158,618	455,356	3,471	43.33	28,460
Jordan	8	193,631,935	220,176	4,666	1.59	27,522
Montenegro	2	34,392,972	19,480	7,253	0.30	9,740
Morocco	7	504,036,071	679,630	3,044	14.03	97,090
Pakistan	26	219,397,556	1,968,477	1,214	60.19	75,711
Peru	60	8,732,062,543	3,623,360	6,112	12.74	60,389
Russia	41	241,615,361	89,271	13,284	0.05	2,177

Vietnam	33	5,296,099,213	7,365,619	1,543	43.46	223,201

Source (1): MIX market, http://www.mixmarket.org/ [Data processed by the research paper author]
Source (2): World Bank: http://data.worldbank.org/ [Data processed by the research paper author]

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POSITION OF POLAND AND POLISH ENTERPRISES IN THE INTERNATIONAL COMPETITIVENESS RANKINGS

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Abstract
The aim of the study is to assess the competitive position of Poland against the background of other countries around the world, in macroeconomic terms, based on the most popular international competitiveness rankings. The paper also attempts to determine the greatest strengths and weaknesses of the Polish economy. The analysis was conducted based on rankings developed by the following international economic organisations: the World Economic Forum, the World Bank, the IMD World Competitiveness Center and the Heritage Foundation. The study covered 2012-2016. The rankings are developed based on a diversified methodology, i.e. some of them attach greater importance to economic factors, others – to social or institutional conditions. It is, however, clear that the subjective and objective scope of relevant data enables these rankings to be considered as representative for the entire world and enables particular countries to be compared in terms of the competitiveness of their economies. As a matter of fact, these rankings cover issues of relevance to the competitiveness of economies, economic freedom, a start-up and doing business environment. Having analysed the position of Poland against the background of other countries around the world in the competitiveness rankings referred to above, it may be clearly stated that the greatest strength of the Polish economy, as far as its competitive potential in the contemporary world is concerned, is the educational level of society and a high degree of respect for property rights. Poland's overall state of the economy is ranked relatively favourably as well. By far the greatest weaknesses of the Polish economy are as follows: the level of technological infrastructure, relatively low R&D expenditure, poor cooperation between science and practice as well as major impediments to doing business – bureaucracy, unstable commercial law, heavy procedures. That is why Poland is ranked fairly average in the international competitiveness rankings, primarily in knowledge- and innovation-based economic development rankings. The competitiveness of entities operating in the Polish economy may only be improved by State authorities through greater organisational and financial incentives to stimulate the development of innovative processes, including primarily higher R&D expenditure and incentives for cooperation between production and scientific research entities, more stable and efficient operation of administrative bodies operating in production entities' environment.

Key words: International competitiveness, Competitive position, Ranking, International organizations

***JEL* classification:** F33, M21, O57, P52

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Introduction

The literature abounds with definitions of the international competitiveness of the economy. Generally, international competitiveness is the ability of the economy to compete in global markets. It is also sometimes defined as the ability to achieve long-term economic growth. In classical terms, competitiveness was associated mostly with market entities and was a microeconomic category. Over time, however, the term "competitiveness" has started being interpreted more widely, moving towards a more comprehensive view of competitiveness which, besides an international aspect, covers the macro- and microeconomic condition of the economy as well (Szczepaniak, 2014).

As there is no clear definition of international competitiveness, different international competitiveness measures are used (out of many such measures). This is reflected, among others, in the development of rankings which classify economies of particular countries according to established criteria. These rankings not only present the competitive position of countries in the world, but also enable competitiveness determinants of particular countries to be identified. On the one hand, the position of a specific country in these rankings demonstrates the competitiveness of its economy and, on the other hand, somewhat conditions the competitiveness of particular sectors of its economy. It can be observed that rankings, which are published by various international institutions developing competitiveness rankings, share many common elements related to, among others, economic growth, innovativeness or technological progress. Only having analysed methodological assumptions, however, it is possible to more precisely determine the scope of the definition of international competitiveness from every perspective presented. In accordance with definitions used by international institutions, economic competitiveness is construed in many dimensions and areas. It is assessed by using various indices, which are usually of particularly high complexity, described by tens and even hundreds of quantitative and qualitative variables.

The aim of the study is to assess the competitive position of Poland against the background of other countries around the world, in macroeconomic terms, based on the most popular international competitiveness rankings. Furthermore, the analysis was used to attempt to determine the greatest strengths and weaknesses of the Polish economy. The analysis was conducted based on rankings developed by the following international economic organisations:

- the World Economic Forum (WEF) – the Global Competitiveness Report,

- the World Bank – the Doing Business Report,
- the IMD World Competitiveness Center – the World Competitiveness Yearbook,
- the Heritage Foundation – the Index of Economic Freedom.

The rankings are developed based on the diversified methodology, i.e. some of them attach greater importance to economic factors, others – to social or institutional conditions. It is, however, clear that the subjective and objective scope of relevant data enables these rankings to be considered as representative for the entire world and enables particular countries to be compared in terms of the competitiveness of their economies. As a matter of fact, these rankings cover issues of relevance to the competitiveness of economies, economic freedom, the start-up and doing business environment. The paper presents results of these rankings of 2012-2016.

Global Competitiveness Report

The Global Competitiveness Report (Global…, 2016) is one of the most popular international competitiveness reports. It includes a comprehensive ranking and a comparative analysis of countries around the world in terms of their economic competitiveness. It takes into account country-specific macroeconomic conditions, the quality of public institutions and technological advancement. Advantages of the Global Competitiveness Report include: complexity, syntheticity, scope, frequency and methodological stability. It is published annually by the World Economic Forum. It is developed based on an assessment of the so-called Global Competitiveness Index (GCI) which is a measure of medium-term prospects for economic development. The Index is particularly important to foreign investors who see it as the first stage of selecting markets in which they will invest, including a source of the comparative analysis. The Index is based on twelve basic pillars grouped into three subindices: (I) basic requirements, (II) efficiency enhancers and (III) innovation and sophistication factors (Table 1).

The presented competitiveness pillars (the most important global competitiveness determinants), which are based on 113 different parameters, are used by the World Economic Forum to develop the said GCI. The pillars are strongly interconnected and the final GCI takes into account relationships between them. The Index assesses abilities of particular countries to achieve economic growth and therefore enables the situation of the country analysed to be assessed in terms of its macroeconomic competitiveness.

Table 1. Economic competitiveness pillars at particular economic development stages of a country according to the World Economic Forum

STAGE I Factor-driven economies (extensive)	**Subindex I: Basic requirements**	
	P 1.	Institutions
	P 2.	Infrastructure
	P 3.	Macroeconomic environment
	P 4.	Healthcare and primary education
STAGE II Efficiency-driven economies (intensive)	**Subindex II: Efficiency enhancers**	
	P 5.	Higher education
	P 6.	Goods market efficiency
	P 7.	Labour market efficiency
	P 8.	Financial market development
	P 9.	Technological readiness
	P 10.	Market size
STAGE III Innovation-driven economies	**Subindex III: Innovation and sophistication factors**	
	P 11.	Business sophistication
	P 12.	Innovation

Source: *own study based on: the Global Competitiveness Report 2012-2016, http://www.weforum.org/reports/global-competitiveness-report* (Access: February 17th, 2017).

In was also assumed in the study that the functioning of countries differs between economic development stages, hence the division into three economic development stages: Stage I – factor-driven economies (extensive), Stage II – efficiency-driven economies (intensive), and Stage III – Innovation-driven economies. The first stage is typical of countries whose development is based primarily on initial endowments in production factors, i.e. on natural resources and unskilled labour. Second-stage countries improve their competitiveness based on efficiency factors, such as production quality and efficiency, and labour

productivity. The third group includes countries whose development is based primarily on the ability to innovate assessed based on both the innovativeness of the economy and the development of the business environment (Grynia, 2015).

The latest Global Competitiveness Report 2016-2017 (Global..., 2016) assessed the competitive position of 138 countries based on the GCI. It is therefore one of the most comprehensive economic competitiveness assessment sources in the world. In recent years, the position of Poland in the ranking has improved (Table 2). In 2016, Poland was ranked 36th with the GCI equal to 4.56, i.e. five positions higher than in 2012. Among EU Member States, Poland is ranked 16th behind twelve EU-15 Member States and only three EU-13 Member States. The higher position of Poland in the competitiveness ranking of the World Economic Forum demonstrates that the Polish economy remains one of more competitive economies among new EU Member States. Its position is assessed as stable and has oscillated around the 40th place in the ranking for many years, while the GCI gap between Poland and its neighbours is narrow.

The ranking's TOP 10 have been stable for many years. Switzerland has been ranked 1st continuously since 2009 with the GCI equal to 5.81 in 2016 and a stable position. It was followed by Singapore with the Index equal to 5.72 (its position stable as well) and the United States of America with the Index equal to 5.70 (following an earlier decline – ranked 7th in 2012). Their economies are capable of continued growth, are attractive and open to all kinds of new products, they market innovative products and services. TOP 10 include also five EU Member States: the Netherlands (ranked 4th), Germany (5th), Sweden (6th), the United Kingdom (7th) and Finland (10th).

Table 2. Position of Poland in the competitiveness ranking of the World Economic Forum

(GCI ranking)

Subindices and competitiveness pillars	2012-2013		2014-2015		2016-2017		Change 2016-2017/ 2012-2013	
	position	GCI	position	GCI	position	GCI	position	GCI
I. Basic requirements	**61**	**4,66**	**55**	**4,80**	**45**	**4,91**	**+16**	**+0,25**
P 1. Institutions	55	4,11	56	4,02	65	3,99	-10	-0,12
P 2. Infrastructure	73	3,89	63	4,24	53	4,34	+20	+0,45
P 3. Macroeconomic environment	72	4,60	63	4,77	45	5,14	+27	+0,54
P 4. Healthcare and primary education	43	6,03	39	6,17	38	6,19	+5	+0,16
II. Efficiency enhancers	**28**	**4,69**	**32**	**4,64**	**34**	**4,64**	**-6**	**-0,05**
P 5. Higher education	36	4,92	34	5,04	37	5,03	-1	+0,11
P 6. Goods market efficiency	51	4,39	51	4,49	47	4,57	+4	+0,18
P 7. Labour market efficiency	57	4,48	79	4,14	79	4,13	-22	-0,35
P 8. Financial market development	37	4,59	35	4,60	46	4,24	-9	-0,35
P 9. Technological readiness	42	4,66	48	4,47	46	4,76	-4	+0,10
P 10. Market size	19	5,12	19	5,12	21	5,13	-2	+0,01
III. Innovation and sophistication factors	**61**	**3,66**	**63**	**3,66**	**55**	**3,74**	**+6**	**+0,08**
P 11. Business sophistication	60	4,06	63	4,06	54	4,10	+6	+0,04
P 12. Innovation	63	3,25	72	3,26	60	3,39	+3	+0,14
Overall Index	**41**	**4,46**	**43**	**4,48**	**36**	**4,56**	**+5**	**+0,10**

Note: "+" ranked higher, "–" ranked lower.

Source: *own study based on the Global Competitiveness Report 2012-2016, http://www.weforum.org/reports/global-competitiveness-report* (Access: February 17th, 2017).

The overall assessment of the competitive position of a specific country in the GCI ranking involves many different factors. Against the background of 138 analysed countries around the world, the position of the Polish economy was assessed based on the above twelve competitiveness pillars grouped into three subindices of the ranking developed by the World Economic Forum. Poland was ranked relatively high in the GCI ranking only in one of the twelve assessed competitiveness pillars, i.e. "market size" (21st). It was ranked moderately high in "higher education" (37th) and "healthcare and primary education" (38th) pillars. The pillars were classified into a group of efficiency or basic factors (Table. 2).

According to the GCI ranking, the greatest weaknesses of the Polish economy in 2016 were the following competitiveness pillars: "labour market efficiency" (79th, down from the 57th place in 2012), "institutions" (65th, down by 10 places), "innovation" (60th, up from the 63rd place) as well as "infrastructure" and "business sophistication" (respectively 53rd and 54th).

A thorough analysis of the competitiveness of Poland, which takes into account specific factors, allows for indicating spheres of socio-economic reality which both have a significant impact on the value of the GCI and require a significant improvement. As far as Poland is concerned, an area related to broadly understood economic innovativeness definitely requires such an improvement. Polish companies still invest too little in R&D and do not develop cooperation in this field with higher education institutions and R&D institutes. This involves both the need for huge financial expenditure and entrepreneurs' higher awareness of this field. However, strengths of the Polish economy include the market size and the macroeconomic environment. Communication technologies (roads, the Internet, infrastructure, IT), public communication quality and financial market development were also quite a success for Poland.

1. Doing Business Report

The Doing Business Report (Doing…, 2016), which has been developed for thirteen years by the World Bank, presents a ranking of doing business environments. Doing Business reports' methodology is transparent, as it uses actual information on laws and regulations of various countries around the world. Ranking data were compiled by over five thousand experts from 190 countries around the world. Studies involve representatives of State authorities, lawyers, economists, accountants and consulting companies' experts who deal with business legislation on a daily basis. These data not only describe the extent to

which specific regulatory obstacles affect enterprises, but also indicate their sources and areas which may be improved by reforms.

The aim of the Doing Business ranking is to determine the level of difficulties encountered by entrepreneurs in doing business in different countries. A thorough analysis of ranking areas enables the life cycle of a company to be traced – from its foundation through different areas of its operation up to its bankruptcy. The Doing Business Report describes what impact the legal environment has on the following ten business areas of an enterprise (Doing…, 2016):

1. starting a business – procedures, time, and paid-in minimum capital;
2. dealing with construction permits – procedures, time and cost of inspections and obtaining permits/licenses;
3. getting electricity – procedures, time and cost to get connected to the electrical grid;
4. registering property – procedures, time and cost to transfer a property;
5. getting credit – movable collateral laws and credit information systems;
6. protecting minority investors – openness and responsibilities of the Management Board to shareholders;
7. paying taxes –number of taxes paid, hours spent on developing tax returns per year and tax payable as a share of gross income;
8. trading across borders – number of documents, signatures and time required for an entrepreneur to import or export goods;
9. enforcing contracts – procedures, time and cost of entering into and enforcing debt contracts;
10. resolving insolvency – time, cost and recovery rate in bankruptcy.

In any of the business areas above, account is taken of many different factors, e.g. costs, process duration and the number of procedures. This is how the result of a specific country in particular ranking areas is determined. The position of a specific country in the Doing Business raking is determined based on area-specific results; however, upper and lower limits are set by countries with the best and worst area-specific results. The higher the ranking, the better (usually

simpler) the doing business legislation and the stronger the legal protection of property (Tereszczuk, 2015).

For many years, countries with a high level of economic development and favourable doing business conditions have been ranked highest by the World Bank. In the 2016 ranking (Doing..., 2016), these countries were as follows: Singapore, New Zealand, Denmark, the Republic of Korea, Hong Kong, the United Kingdom, the United States of America, Sweden, Norway and Finland. The presence of the Republic of Korea here may be surprising, but it has implemented numerous pro-business reforms in recent years which moved it up in the ranking. The ranking's TOP 10 included four EU Member States, i.e. Denmark (ranked 3rd), the United Kingdom (6th), Sweden (8th) and Finland (10th).

In the Doing Business ranking 2016, Poland was ranked 25th among 189 countries around the world, i.e. much higher than in 2012 (by thirty-seven positions). Poland owes its higher position in the ranking of the World Bank to several reforms which primarily introduced easier start-up and permit procedures and tax payment amendments, e.g. an electronic VAT accounting system. Poland is ranked 12th among EU Member States behind eight EU-15 Member States and three EU-13 Member States (Estonia – ranked 16th, Lithuania – 20th, Latvia – 22nd), and followed by EU-15 Member States such as: France (ranked 27th), the Netherlands (28th), Spain (33rd), Belgium (43rd), Italy (45th), Greece (60th) and Luxembourg (61st).

Table 3. Position of Poland in the competitiveness ranking of the World Bank (ranking on the ease of doing business)

No.	Criteria	2012	2014	2016	Change 2016/2012
1.	Starting a business	126	116	85	+41
2.	Dealing with construction permits	160	88	52	+108
3.	Getting electricity	64	137	49	+15
4.	Registering property	89	54	41	+48
5.	Getting credit	8	3	19	-11
6.	Protecting minority investors	46	52	49	-3
7.	Paying taxes	128	113	58	+70
8.	Trading across borders	46	49	1	+45
9.	Enforcing contracts	68	55	55	+13
10.	Resolving insolvency	87	37	32	+55
Ease of doing business rank		**62**	**45**	**25**	**+37**

Note: "+" ranked higher, "–" ranked lower.

Source: *own study based on the Doing Business Report 2012-2016, http://www.doingbusiness.org* (Access: February 17th, 2017).

Poland stands out not only with its high position in the overall ranking on the ease of doing business (ranked 25th among 189 analysed countries), but also with some specific indices, particularly with aspects such as: trading across borders (ranked 1st), getting credit (19th), resolving insolvency (32nd) or registering property (41st). In 2016, Poland was ranked low (85th) in the "starting a business" category which is, however, much higher than in 2012 by 41 positions. It was also ranked relatively low in: "paying taxes" (58th), "enforcing contracts" (55th) and "dealing with construction permits" (52nd) categories – Table 3.

The Doing Business Report assesses what impact the current regulatory environment actually has on doing business. In fact, the ease of doing business ranking does not provide a comprehensive picture of economic competitiveness, but it consistently presents this part of economic reality which has a significant impact on the doing business environment in a specific country. Poland is ranked quite well here, as its doing business environment has improved in recent years. In addition to better business conditions, the Doing Business ranking also indicates areas where there is still work to be done by Poland, among others, legislation and procedures to be simplified or shortened, to be made cheaper as far as implementation costs are concerned, etc.

2. World Competitiveness Yearbook

Another international economic competitiveness ranking is the World Competitiveness Scoreboard, which is a part of the World Competitiveness Yearbook (World..., 2016), developed annually since 1989 by the International Institute for Management Development in Lausanne (IMD). The main sources of information on the countries analysed, which are used in studies, are official State information, IMD correspondents' reports and mass media news. The ranking pays less attention to theoretical and methodological aspects, and more attention to facts and politics which shapes the country's ability to create and maintain an environment that promotes value creation by enterprises and well-being achievement by the population.

The International Institute for Management Development uses four areas for measuring and comparing competitiveness. They are partially similar to those used by the World Economic Forum, but the IMD's number of assessment criteria, which affect particular areas, is much higher. It assesses particular areas based on up to 340 criteria, i.e. it takes into account many more factors than the World Economic Forum.

Areas and categories, which are used by the IMD to develop the competitiveness ranking of individual countries (World…, 2016; Tereszczuk, 2015), are as follows (Table 4):

1. Economic performance – the national economy (macroeconomic performance assessment); international trade (share in world trade, payment, trade balance, export, import); foreign investments (direct and indirect); employment (number of employees, the employment growth rate, employment in particular sectors of the economy, the youth unemployment rate) and prices (cost of living index for major cities, the rental cost of apartments and office space).

2. Government efficiency – public finance (budget deficit, public finance management, government spending); fiscal policy (personal and corporate taxes, VAT, social insurance, real tax burden); institutional and business structures (assessment of the central bank's policy, of the government's policy, of the level of bureaucracy, of the transparency of the government's policy and of the degree of corruption); business legislation (efficiency assessment of customs administration, public sector contracts, international contracts, access to capital markets, investment incentives, competition legislation, legislation on products and services, investment conditions and labour market legislation); social structures (justice, discrimination, political stability and risk assessment).

3. Business efficiency – productivity and efficiency (real productivity growth in industry and services, SME development); the labour market (level of remuneration, unit labour costs, executive remuneration, the number of working hours, workplace relationships, employee motivation, skilled labour availability, women's share in the labour market, experience exploitation); finance (efficiency of the banking sector, the assessment of the capital market's operation and finance management); management practice (assessment of executives' and management methods' innovativeness, marketing, ethics, consumer satisfaction); the system of attitudes and values (national culture, the need for economic and social reforms, social values).

4. Infrastructure – basic infrastructure (area, urbanisation, labour force assessment, transport, energy infrastructure quality assessment); technological infrastructure (technological capacity assessment, telecommunication investments, the use of computers, the Internet) and scientific infrastructure (development assessment); health and the environment (healthcare spending, environmental pollution) and education (education spending, staff quality).

In order to assess the competitive position of particular countries, the twenty IMD competitiveness ranking areas, which are referred to above, are divided into specific categories. Only a thorough analysis of a specific country in each of these categories enables its competitive position in the ranking to be assessed.

Table 4. Areas and categories for the development of the IMD competitiveness ranking of countries

Economic performance	**Government efficiency**	**Business efficiency**	**Infrastructure**
National economy	Public finance	Productivity/efficiency	Basic infrastructure
Foreign trade	Fiscal policy	Labour market	Technological infrastructure
Foreign investments	Institutional structure	Finance	Scientific infrastructure
Employment	Business legislation	Management practices	Health and the environment
Prices	Social structure	Behaviours and values	Science

Source: *own study based on the World Competitiveness Yearbook 2012-2016; http://www.imd.org/wcc/wcy-world-competitiveness-yearbook* (Access: February 17th, 2017).

One disadvantage of IMD studies is a limited subjective scope compared to the rankings discussed above. The latest edition of the World Competitiveness Yearbook 2016 takes into account only 61 countries (in 2012 – 59 countries). This is due to, among others, the Institute's selection criteria – a specific country is included in the ranking if reliable statistical data on that country can be obtained from internal partner institutions and international organisations (UN, WTO, IMF), while its economy is based on principles of economic freedom and its share in the international market is significant (World..., 2016).

The competitiveness ranking, which is published annually by the International Institute for Management Development, presents position and score (Index of 0-100), while the point of reference is a country which is ranked 1st and which scores 100.0. At the same time, the ranking includes several aggregate sections which allow for adopting more thorough approaches to competitiveness. The overall assessment of the competitive position of Poland in the IMD ranking is

based on indices which describe detailed criteria falling into the four areas above (Table 5).

In the overall IMD competitiveness ranking of 2012-2016, the position of Poland improved by one place and it can thus be said that its position was stable. In the "economic performance" area, Poland fell by three positions to the 33rd place. In "government efficiency" and "infrastructure" areas, Poland was ranked respectively 33rd and 35th which is slightly higher, i.e. by three places and one place. In the "business efficiency" area, Poland remained at the same 33rd place (Table 5).

Table 5. Position of Poland in the competitiveness ranking of the International Institute for Management Development (IMD ranking)

No.	Areas	2012	2014	2016	Change 2016/2012
1.	Economic performance	30	36	33	-3
2.	Government efficiency	36	30	33	+3
3.	Business efficiency	39	36	39	0
4.	Infrastructure	36	36	35	+1
Overall IMD ranking position		**34**	**36**	**33**	**+1**

Note: "+" ranked higher, "–" ranked lower.

Source: *own study based on the IMD World Competitiveness Yearbook 2012-2016; http://www.imd.org/wcc/wcy-world-competitiveness-yearbook* (Access: February 17th, 2017).

In 2016, Hong Kong (Index of 100.0) was ranked 1st in the IMD ranking, being followed by countries whose Index was 98-90: Switzerland (ranked 2nd), the United States of America (3rd), Singapore (4th), Sweden (5th), Denmark (6th), Ireland (7th), the Netherlands (8th), Norway (9th) and Canada (10th). Ukraine, Mongolia and Venezuela, whose Index was below 50.0, were ranked lowest. Poland was ranked 33rd in the IMD competitiveness ranking, scoring 71.303, i.e. its competitive position improved compared to 2012 (by one place) and 2014 (by two places). However, Poland slightly fell in the ranking as far as its 2012 position (32nd) is concerned. Nevertheless, the position is not satisfactory for our country, especially that the study covered only 61 countries. Poland is behind fourteen EU Member States, including eleven EU-15 Member States and three EU-13 Member States (the Czech Republic – ranked 29th, Lithuania – 28th, and

Estonia – 31st). The gap between Poland and its neighbouring countries was not too large. However, it was far ahead of Greece (ranked 56th), Bulgaria (50th), Romania (49th), Hungary (46th), Slovenia (43rd) and Slovakia (40th), and not so far ahead of Portugal (39th), Latvia (37th), Italy (35th) and Spain (34th).

The relatively average position of Poland in the IMD competitiveness ranking, the relatively stable position in the analysed period and the balanced position in all major areas of assessment indicate the need for focusing on strengthening that position. All decision-making actors of relevance to the economic development of Poland should keep this in mind.

5. Index of Economic Freedom

In cooperation with "The Wall Street Journal", the Heritage Foundation (U.S. research centre) annually develops and publishes a ranking of countries (Miller, 2016) based an assessment of the so-called Index of Economic Freedom (IEF). The purpose of the ranking is to rank countries according to their solutions and policies for increasing economic freedom, and thus to promote the development of and to enhance the well-being of nations. The Index of Economic Freedom analyses: the rule of law (property rights, the level of corruption), the size of the public sector (fiscal policy, public spending), regulatory efficiency (doing business environment, monetary policy, the labour market) and market openness (trade, investments, finance).

Compared to the previously analysed rankings, it is not therefore a complete set of competitiveness indices, but it takes into account elements of economic reality which significantly influence that reality. In various countries around the world, the assessment covers, among others: restrictions and coercive measures used by the State apparatus, the freedom of establishment, trade policy, tax burden, fiscal policy, labour market policy and the degree of corruption. The Index of Economic Freedom is developed based on ten categories[1] (the so-called "economic freedoms") grouped into the following four pillars: legislation, government intervention in the economy, legislation efficiency and the free market (Miller, 2016).

These categories include fifty independent variables of the same weight. At the highest level of aggregation, each "freedom" is scored from 0 to 100 and the overall assessment of the economic freedom of a specific country is the arithmetic mean of assessments of particular variables. The less the country scores, the

[1] The following are ten categories affecting economic freedom: 1. trade policy; 2. tax burden; 3. government intervention in the economy; 4. monetary policy; 5. capital flow and foreign investment; 6. banking and finance; 7. wages and prices; 8. property rights; 9. regulation; 10. black market activity.

greater the scope of State intervention in the economy and the lower the level of economic freedom. This is how the ranking of countries is developed – from countries with the highest economic freedom (with the highest score) to countries with the lowest economic freedom (with the lowest score). Having taken into account the scoring, countries were assigned to one of five groups (Miller, 2016):

1. Free – 100.0-80.0 points

2. Mostly free – 79.9-70.0 points

3. Moderately free – 69.9-60.0 points

4. Mostly unfree – 59.9-50.0 points

5. Repressed – 49.9-0.0 points.

In 2016, the following countries were ranked highest in the Ranking the World by Economic Freedom: Hong Kong – ranked 1st continuously since 2010 – scoring 88.6 points, Singapore – ranked 2nd continuously for six years as well – scoring 87.8 points, and New Zealand – ranked 3rd – scoring 81.6 points, being followed by: Switzerland – 81.0; Australia – 80.3; Canada – 78.0; Chile – 77.7; Ireland – 77.3; Estonia – 77.2, and the United Kingdom – 76.4. TOP 10 included only three EU Member States: Ireland (ranked 8th), Estonia (9th) and the United Kingdom (10th).

In accordance with the Heritage Foundation, fully economically free countries are countries which scored above 80 points. The 2016 ranking included only five countries which may be described as "free", i.e.: Hong Kong, Singapore, New Zealand, Switzerland and Australia. The group of "mostly free" countries included thirty-three countries, including thirteen EU Member States (nine of which are EU-15 Member States and four of which are EU-13 Member States). The group included also: the United States of America, Japan, the Republic of Korea and Norway. Another group included fifty-five "moderately free" countries, thirteen of which were EU Member States – Poland was among them with a fairly high Index of 69.3 points. There were 85 "mostly unfree" and "repressed" countries in total (respectively sixty-one and twenty-four countries).

In the presented competitiveness ranking, Poland moved up from the 64th place in 2012 to 39th place in 2016 with the IEF equal to 69.3 points ("moderately free"). Poland has never achieved a higher Index. It improved its

score in the analysed period by 2.3 points. It was due to improved fiscal policy, higher public spending and improved monetary policy as well as reduced corruption. In 2012-2016, economic freedom in Poland improved, but our country is not likely to be considered as "mostly free" in the near future.

In conclusion, the Index of Economic Freedom does not cover many aspects of international competitiveness, but the analysis of economic freedom seems to be one of more important elements in developing international rankings of economies of particular countries. Therefore, the Index should be considered as supplemental in developing such rankings.

Summary

The study presented competitiveness rankings developed by the following international economic organisations: the World Economic Forum (WEF) – the Global Competitiveness Report, the World Bank – the Doing Business Report, the IMD World Competitiveness Center – the World Competitiveness Yearbook, and the Heritage Foundation – the Index of Economic Freedom. The rankings are developed based on the diversified methodology, but it is clear that the subjective and objective scope of relevant data enables these rankings to be considered as representative for the entire world and enables particular countries to be compared in terms of the competitiveness of their economies. As a matter of fact, these rankings cover issues of greatest relevance to the competitiveness of economies, economic freedom, the start-up and doing business environment.

Data, which are used in the rankings, also enable the overall assessment of the competitiveness of the Polish economy. In 2012-2016, Poland achieved fairly average results of the assessment in most rankings. In the Doing Business ranking 2016 published by the World Bank, Poland was ranked 25th among 189 classified countries in terms of facilities for entrepreneurs. In the ranking of the World Economic Forum, Poland was ranked 36th in 2016 among 138 assessed countries. In accordance with the Heritage Foundation (research centre), Poland was ranked 39th in 2016 in terms of economic freedom among 178 analysed countries. In the ranking of the IMD World Competitiveness Canter, Poland was ranked 33rd in 2016 among 61 assessed countries. In the analysed period, it recorded the largest leap, i.e. by thirty-seven positions, in the Doing Business ranking which measures the ease of doing business. In the Index of Economic Freedom developed by the Heritage Foundation, Poland recorded a noticeable improvement, i.e. by twenty-five positions, as well. In the next two international competitiveness rankings, i.e. the Global

Competitiveness Report and the World Competitiveness Yearbook, the competitive position of Poland has remained similar in recent years.

Having analysed the position of Poland against the background of other countries around the world in the competitiveness rankings referred to above, it may be clearly stated that the greatest strength of the Polish economy, as far as its competitive potential in the contemporary world is concerned, is primarily the educational level of society and a high degree of respect for property rights, which is favourable as far as "attracting" the capital of foreign investors is concerned. Poland's overall state of the economy is ranked relatively favourably as well (macroeconomic indices) which is of great importance to the possibility of support for entities operating in various sectors of the economy. By far the greatest weaknesses of the Polish economy are as follows: the level of technological infrastructure, relatively low R&D expenditure, poor cooperation between science and practice as well as major impediments to doing business – bureaucracy, unstable commercial (in particular tax) law, heavy procedures. That is why Poland is ranked fairly low (at best average) in the international competitiveness rankings, primarily in knowledge- and innovation-based economic development rankings, and its position in these rankings improves too slowly.

The competitiveness of entities operating in the Polish economy, in particular production companies, may only be improved by State authorities through greater organisational and financial incentives to stimulate the development of innovative processes, including primarily higher R&D expenditure and incentives for cooperation between production and scientific research entities, more stable and efficient operation of administrative bodies operating in production entities' environment. Moreover, knowledge- and innovation-based competitiveness development rankings indicate the necessity to increase R&D expenditure by using funds of production companies and to build the competitive position to a much greater extent based on creative rather than replacement innovation which imitates achievements of other countries and their entities.

There is no doubt that the Polish strengths and opportunities for foreign expansion should be based on human capital and entrepreneurial potential rather than on financial capital. Globalisation made it possible to gain, for the first time on such a scale, the global market differently, i.e. lacking capital, lacking domestic demand, lacking production competence, by choosing the path of knowledge of the market and contract outsourcing. Such a systemic approach may be a great opportunity for numerous talented Poles and for thousands of Polish enterprises which are potential partners of global companies. The world faces a ruthless struggle for economic success, a struggle for victory and enrichment in times of

instability and in a volatile environment – those who lose that struggle will suffer resulting adverse consequences. The State cannot be indifferent to which group

Polish enterprises and Polish citizens will belong to (Szymański, 2016). The above conditions may significantly improve the position of Poland and Polish enterprises in the international competitiveness rankings.

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PREDICTION OF BANKING SECTOR CONDITION

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Abstract
The aim of the paper has been to analyse the European banking sector credit ratings. At first it has been presented the literature review that analyses the mentioned topic. As a result it has been put the following hypothesis: The banking sector credit ratings are strictly connected with the country's notes. In the paper have been presented methodologies of the credit ratings agencies, that are used during the estimation of the banks' default risks. The analysis of the condition of the banking sector has been prepared by using notes that are given by Fitch and S&P for banks from the Eurozone and Central and Eastern Europe. There have been collected data from the World Bank and reports prepared by the mentioned agencies.

***Key words*:** Credit rating, Default risk, Banking sector

***JEL Classification*:** G21, G24, G32.

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Introduction

Credit rating agencies are responsible for the reduction of the information between the issuers and investors. They main goal is to analyse and estimate the risk of the default. Credit rating agencies analyse three group of factors. To the first of them belong the financial indicators. The send one take into consideration the country's financial situation. The last of them are determinants connected with the particular sectors. The aim of the presented paper has been to analyse the European banking sector credit ratings. Banks are one of the most interested clients of credit ratings. They used notes for estimation the default risk of the borrowers. They also verify the investment decisions in the debt securities by the taking into account the credit rating. Notes are also significant during the cooperation between banks. In the paper have been put the following hypothesis: The banking sector credit ratings are strictly connected with the country's notes.

The paper consists on the three sections. The next section is the description of the methodology used by Moody and S&P. Next have been presented current researches that analyse the banking sector condition. In the third section has been described the current situation on the banking sector in Europe.

1. Methodology of estimation impact of macroeconomic factors on banks' credit ratings

1.1. Moody's Investor Service

One of the biggest credit rating agency is Moody's Investor Service. Notes given by the mentioned institution is type of the "stand – alone" and "all – in ratings". A stand-alone rating reflects the intrinsic strength of the institution and likelihood of default is analysed without the possibility of external support in future (Packer and Tarashev, 2011, p. 42). During the analysis Moody's Investor Service combine the following points, stage-by-stage, to generate ratings for each debt/creditor class:

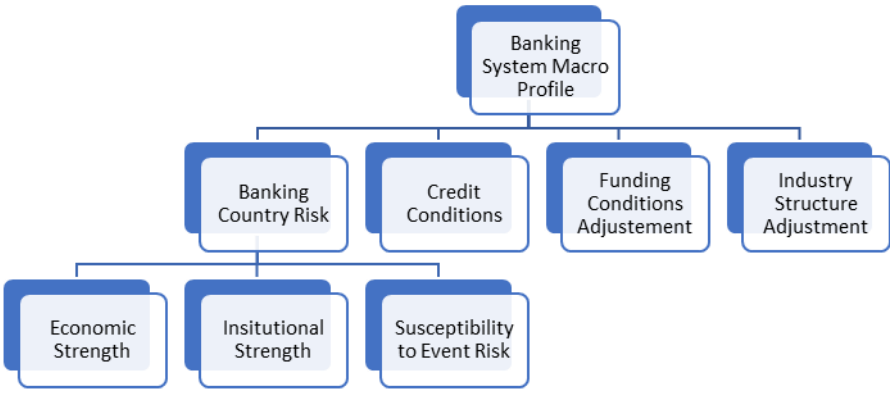
- assessment of a bank's standalone creditworthiness results in a baseline credit assessment (BCA). The BCA represents opinion regarding the bank's probability of standalone failure in the absence of external support;
- assessment of support from affiliates to determine our Adjusted BCA. At this stage in our analysis, "affiliates" refers to a parent, group or co-operative structure, for example;

- analysis of a "Loss Given Failure" (LGF). This assesses the impact of the bank's failure on the expected loss of each creditor class in response to

  different forms of expected resolution, firm-wide loss rates and liability structure. Moody's use this together with additional notching relating to other risks, to arrive at our preliminary rating assessment (PRA) for each rated instrument
- appraisal of the potential for government support being provided if needed, specific to each instrument class, to determine the final credit rating for each rated instrument as well as Counterparty Risk Assessment (Moody's , 2016a).

To analytic process are taken information about historical performance based on core credit metrics. Then are analyzed future trends in these credit metrics and quantitative adjustment. To verify the banks' credit risk are taken three components: macro profile, financial ratios and quantitative factors. The basic goal of the analysis is present the macroeconomic determinants impact on the banks' credit rating assessment. During the analytic process are taken factors presented on the graph 1.

Graph 1. Macro profile construction**.**



Source: own elaboration based on Moody's (2016).

Moody's Investor Service in methodology of assessment of bank's credit rating risk take into consideration 25 weight of impact of macro profile on the final note.

The first point of the analysis take into account banking country risk. In the mentioned group of factors, it can be distinguished:

- Economic strength,
- Institutional strength,

- Susceptibility to event risk.

Economic strength factors express the impact of macroeconomic factors on the banks financial environment. The previous researches take into analysis the impact of the business cycle measured by changes in GDP growth on the asset quality, earrings and their volatility and then on the solvency risk. In main of researches is explored the practicality of credit ratings phenomenon (Casaroni, 2015; Auh 2013; Freitag 2015). According to the Moody's Investor Service, larger, more developed economies have got the positive impact on the banking system and the condition of particular banks. For the assessment process, Moody's propose the following factors:

- Growth dynamics,
- Scale of the economy,
- National income,
- Adjustment factors.

The second group of banking credit risk are factors connected with the institutional strength. These group of factors analyses the impact of the legal framework on the condition of the banking sector. During the assessment process is analyzed the influence of the corruption, institutional weakness and inflation on the notes received by banks. The mentioned factors are classified on the following groups of determinants:

- Institutional framework and effectiveness,
- Policy credibility and effectiveness.

The last part of the banking credit risk analysis relies on the verification of the "susceptibility of event risk". Moody's to measure the impact of the mentioned factor, uses the following criteria:

- Political risk,
- Government liquidity risk,
- External vulnerability risk.

The mentioned factors and weight of the particular determinants with the indicators are presented in the table 1.

Table 1. Macroeconomic factors used by Moody's Investor Service to analyse banks' credit ratings macro profile.

Broad Rating Factor	**Rating sub-factor**	**Weight**	**Indicators**
Economic Strength	Growth Dynamics	50%	Average Real GDP Growth
			Volatility in Real GDP
			WEF Global Competitiveness Index
	Scale of the Economy	25%	National GDP (in USD)
	National Income	25%	GDP per capita (PPP, in USD)
	Adjustment Factors	1-6 scores	Diversification
			Credit Boom
Institutional Strength	Institutional Framework and Effectiveness	75%	Worldwide Government Effectiveness Index
			Worldwide Rule of Law Index
			Worldwide Control of Corruption Index
	Policy Credibility and Effectiveness	25%	Inflation Level
			Inflation Volatility
	Adjustment Factor	1-6 scores	Track Record of Default
Susceptibility to Event Risk	Political Risk	Max Function	Domestic Political Risk
			Geopolitical Risk
	Government Liquidity Risk	Max Function	Fundamental Metrics
			Market Funding Stress
	Banking Sector Risk	Max Function	Strength of Banking System
			Size of Banking System
			Funding Vulnerabilities
	External	Max	(Current Account Balance +

	Vulnerability Risk	Function	FDI)/GDP
			External Vulnerability Indicator
			Net International Investment Position/GDP

Source: Own elaboration based on Moody's (2016a, 2016b).

Moody's Investor Service, the same like others credit ratings agencies from the "Big three" uses the scoring methods to analyses the impact of the banking credit risk on the particular banks' credit ratings. To verify the mentioned phenomenon it is employed the 15 group of risk, from very high, high, moderate, low and very low. As a result of combination of the economic and institutional strength scoring analysis is received matrix presented on the table 2. Combining economic resiliency and susceptibility to event risk is introduced on the table 3.

Table 2. Banking Country Risk: Combining Economic and Institutional Strength

Economic Strength																
Institutional Strength		VH+	VH	VH-	H+	H	H-	M+	M	M-	L+	L	L-	VL+	VL	VL-
	VH+	VH+	VH+	VH+	VH	VH	VH-	VH-	H+	H+	H	H	H-	H-	M+	M
	VH	VH+	VH	VH	VH-	VH-	H+	H+	H	H	H-	H-	M+	M+	M	M-
	VH-	VH+	VH	VH-	VH-	H+	H+	H	H	H-	H-	M+	M+	M	M	L+
	H+	VH	VH-	VH-	H+	H+	H	H	H-	H-	M+	M+	M	M	M-	L+
	H	VH	VH-	H+	H+	H	H	H-	H-	M+	M+	M	M	M-	M-	L
	H-	VH-	H+	H+	H	H	H-	H-	M+	M+	M	M	M-	M-	L+	L
	M+	VH-	H+	H	H	H-	H-	M+	M+	M	M	M-	M-	L+	L+	L-
	M	H+	H	H	H-	H-	M+	M+	M	M	M-	M-	L+	L+	L	L-
	M-	H+	H	H-	H-	M+	M+	M	M	M-	M-	L+	L+	L	L	VL+

	L+	H	H-	H-	M+	M+	M	M	M-	M-	L+	L+	L	L	L-	VL+
	L	H	H-	M+	M+	M	M	M-	M-	L+	L+	L	L	L-	L-	VL
	L-	H-	M+	M+	M	M	M-	M-	L+	L+	L	L	L-	L-	VL+	VL
	VL+	H-	M+	M	M	M-	M-	L+	L+	L	L	L-	L-	VL+	VL+	VL-
	VL	M+	M	M	M-	M-	L+	L+	L	L	L-	L-	VL+	VL+	VL	VL-
	VL-	M	M-	L+	L+	L	L	L-	L-	VL+	VL+	VL	VL	VL-	VL-	VL-

Source: Moody's (2016a).

Table 3. Banking Country Risk: Combining Economic Resiliency and Susceptibility to Event Risk.

Economic Resiliency																
Susceptibility to Event Risk		VH+	VH	VH-	H+	H	H-	M+	M	M-	L+	L	L-	VL+	VL	VL-
	VH+	VS	VS-	VS-	S+	S	S-	S-	M+	M	M-	W+	W+	W	W-	VW+
	VH	VS	VS-	VS-	S+	S	S-	S-	M+	M	M-	W+	W+	W	W-	VW+
	VH-	VS	VS-	VS-	S+	S	S-	S-	M+	M	M-	W+	W+	W	W-	VW+
	H+	VS	VS-	VS-	S+	S	S-	M+	M	M-	W+	W+	W	W-	VW+	VW+
	H	VS	VS-	VS-	S+	S	S-	M+	M	M-	W+	W+	W	W-	VW+	VW+
	H-	VS	VS-	VS-	S+	S	S-	M+	M	M-	W+	W	W-	VW+	VW+	VW
	M+	VS-	VS-	S+	S	S-	S-	M	M-	W+	W+	W	W-	VW+	VW+	VW
	M	VS-	VS-	S+	S	S-	S-	M	M-	W+	W	W-	VW+	VW+	VW	VW-
	M-	VS-	S+	S	S-	S-	M+	M-	W+	W+	W	W-	VW+	VW+	VW	VW-
	L+	VS-	S+	S	S-	S-	M+	M-	W+	W+	W-	VW+	VW+	VW	VW-	VW-
	L	S+	S	S-	S-	M+	M	W+	W+	W	W-	VW+	VW+	VW	VW-	VW-
	L-	S+	S	S-	S-	M+	M	W+	W+	W	VW+	VW+	VW	VW-	VW-	VW-
	VL+	S	S-	S-	M+	M	M-	W+	W	W-	VW+	VW+	VW	VW-	VW-	VW-

	VL	S	S-	S-	M+	M	M-	W+	W	W-	VW+	VW	VW-	VW-	VW-	VW-
	VL-	S-	S-	M+	M	M-	W+	W	W-	VW+	VW+	VW	VW-	VW-	VW-	VW-

Source: Moody's (2016a).

The next group of factors taken into consideration by the Moody's Investor Service to the assessment process are "credit conditions" factors. To analyse the impact of the mentioned determinant are verified two sub-factors: level of private sector credit/GDP and growth in private sector credit/GDP.

The first of the mentioned determinant is a basic measure of the leverage. To verify the impact of the level of private sector credit to GDP is also used the scoring method. This ratio is classified on a scale from 1 to 15 by using data from the World Bank database, where 1 present the lowest value of risk, and 15 the highest one. The application of the level of private sector credit to GDP is threaten in literature as a good measure of the credit condition of the economy. Higher levels of debt are the natural consequence of financial deepening as economies develop and, hence, may be more sustainable for some mature economies than for others.

The growth in the relation of the private sector credit to GDP helps to analayse the deviation between credit and economic activity. The research literature precise it as an important indicator of greater risk-taking, which often precedes a crisis. The same like in the private sector to GDP ratio analysis, in the scoring method is taken 1-15 scale. Moody's (2016 a) emphasis that the accumulation of debt is sometimes associated with the natural process of financial deepening in developing economies, or sustainable increases in asset prices, and rapid growth does not necessarily signal the same risks in different economies.

Table 4. Combining private sector credit and its rate of change.

Private sector credit/GDP: 70:weight	Change in private sector credit/GDP: 30% weight															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	8	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2
	9	1	1	1	1	1	1	1	1	1	1	2	2	2	3	3
	10	1	1	1	1	1	1	1	1	2	2	2	3	3	3	4
	11	1	1	1	1	1	2	2	2	2	3	3	3	4	4	4
	12	1	1	1	2	2	2	3	3	3	3	4	4	4	5	5
	13	1	2	2	2	3	3	3	4	4	4	4	5	5	5	6
	14	2	2	3	3	3	4	4	4	5	5	5	5	6	6	6
	15	3	3	3	4	4	4	5	5	5	6	6	6	6	7	7

Source: Moody's (2016a).

Table 5. Banks' credit rating macro profile scoring.

Broad Rating Factors	Sub – factor indicators		VH+	VH	VH-	H+	H	H-	M+	M	M-	L+	L	L-	VL+	VL	VL-
Economic Factors	Average Real GDP Growth	Min	>4.50	4	3.5	3	2.75	2.5	2.25	2	1.75	1.5	1.25	1	0.75	0.5	<0.5
		Max		4.9	3.99	3.49	2.99	2.74	2.49	2.24	1.99	1.74	1.49	1.24	0.99	0.74	
	Volatility in Real GDP Growth	Min	<1.44	1.44	1.66	1.76	1.96	2.11	2.20	2.29	2.49	2.64	2.85	3.14	3.36	3.72	>3.95
		Max		1.65	1.75	1.95	2.10	2.19	2.28	2.48	2.63	2.84	3.13	3.35	3.71	3.94	
	WEF Global Competitiveness Index	Min	>4.98	4.61	4.52	4.45	4.39	4.31	4.26	4.22	4.10	4.03	3.95	3.90	3.84	3.75	<3.75
		Max		4.97	4.46	4.51	4.44	4.38	4.30	4.25	4.21	4.09	4.02	3.94	3.89	3.83	
	Nominal GDP (USD bn)	Min	>1000	500	400	300	250	200	175	150	125	100	75	50	25	10	<10
		Max		9999	499	399	299	249	199	174	149	124	99	74	49	24	
	GDP per capita (PPP,	Min	>351	3013	2591	2404	2040	1800	1629	1358	1186	1065	8577	770	591	4320	<432

	USD)		75	0	8	5	2	1	7	7	3	6		8	9		0
		Max		35175	30129	25917	24044	20401	1800	16296	13586	11862	10655	8576	7707	5918	
	Credit Boom																
	Diversification																
Institutional Strength - Institutional Framework and Effectiveness (75%)	Worldwide Government Effectiveness Index (50%)	Min	>1.14	1.01	0.85	0.48	0.34	0.25	0.11	-0.01	-0.1	-0.17	-0.35	-0.41	-0.5	-0.72	<-0.72
		Max		1.13	1.00	0.84	0.47	0.33	0.24	0.10	-0.02	-0.11	-0.18	-0.36	-0.42	-0.51	
	Worldwide Rule of Law Index (25%)	Min	>0.98	0.81	0.64	0.48	0.26	0.06	-0.08	-0.15	-0.29	-0.35	-0.45	-0.57	-0.71	-0.82	<-0.82
		Max		0.97	0.80	0.63	0.47	0.25	0.05	-0.09	-0.16	-0.30	-0.36	-0.46	-0.58	-0.72	
	Worldwide Control of Corruption	Min	>1.03	0.82	0.56	0.32	0.13	-0.06	-0.19	-0.29	-0.39	-0.44	-0.58	-0.64	-0.79	-0.91	<-0.91

	Index (25%)	Max		1.02	0.81	0.55	0.31	0.12	-0.07	-0.20	-0.30	-0.40	-0.45	-0.59	-0.65	-0.80	
Institutional Strength – Policy Credibility and Effectiveness (25%)	Inflation (50%)	Min	1.3	1.2	1.1	1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0	<-0.01
		Max		1.29	1.19	1.09	0.99	0.89	0.79	0.69	0.59	0.49	0.39	0.29	0.19	0.09	
		Min	2.49	2.5	3	3.5	4	5	6	8	10	12.5	15	17.5	20	22.5	>25
		Max		2.99	3.49	3.99	4.99	5.99	7.99	9.99	12.49	14.99	17.49	19.99	22.49	24.99	
	Inflation Volatility (50%)	Min	<1.2	1.2	1.4	1.7	2	2.1	2.5	2.6	2.7	3.1	3.4	3.6	3.8	4.5	>5.6
		Max		1.39	1.69	1.99	2.09	2.49	2.59	2.69	3.09	3.39	3.59	3.79	4.49	5.59	
Institutional Strength – Adjustment Factor (1- 6 scores)	Track Record (N/A)																

Susceptibility to Event Risk – Political Risk (max. function)	Domestic Political Risk – Worldwide Voice and Accountability Index															
	Domestic Political Risk – GDP per capita															
	Geopolitical Risk															
Susceptibility to Event Risk – Government Liquidity Risk (max. function)	Fundamental Metrics – Gross – Gross Borrowing Requirement/GDP	Min	>40	37.6	35.1	32.6	30.1	27.6	25.1	22.6	20.1	17.6	15.1	12.6	10.1	5.1	<5
		Max		40	37.5	35	32.5	30	27.5	25	22.5	20	17.5	15	12.5	10	
	Non – Resident Share of General Government Debt	Min	95.1	90.1	85.1	80.1	75.1	70.1	65.1	60.1	55.1	50.1	45.1	40.1	35.1	30.1	<30
		Max	100	95	90	85	80	75	70	65	60	55	50	45	40	35	

	Market Funding Stress – Market Implied Ratings		Caa3 - C	Caa2	Caa1	B3	B2	B1	Ba3	Ba2	Ba1	Baa 3	Baa 2	Baa 1	A3	A1-A2	Aaa-Aa3
Susceptibility to Event Risk – Banking Sector (max. function)	Strength of Banking System – Average Baseline Credit Assessment (BCA)		caa3 - c	caa2	caa1	b3	b2	b1	ba3	ba2	ba1	baa3	baa2	baa 1	a3	a2	a1-aaa
	Size of Banking System – Total Domestic Bank Assets/GDP	Min	>195. 65	165. 48	131. 95	120. 15	108. 62	97.6 2	91.0 5	87.0 4	76.0 8	65.9 4	60.8 4	54.5 7	49.3 3	39.1 7	<39. 16
		Max		195. 64	165. 47	131. 94	120. 14	108. 61	97.6 1	91.0 4	87.0 3	76.0 7	65.9 3	60.8 3	54.5 6	49.3 2	

	Funding Vulnerabilities Banking System Loan/Deposit	Min	>260	250.1	225.1	200.1	180.1	160.1	140.1	120.1	100.1	90.1	80.1	70.1	60.1	50.1	<50
		Max		260	250	225	200	180	160	140	120	100	90	80	70	60	
Susceptibility to Event Risk – External Vulnerability Risk (max. function)	(Current Account Balance +FDI Inflows)/GDP	Min	<-35	-35	-30	-25	-20	-15	-10	-8	-6	-5	-4	-3	-2	-1	>0
		Max		-30.1	-25.1	-20.1	-15.1	-10.1	-8.1	-6.1	-5.1	-4.1	-3.1	-2.1	-1.1	0	
	External Vulnerability Indicator	Min	>400	300.1	250.1	200.1	180.1	160.1	140.1	120.1	100.1	90.1	80.1	70.1	60.1	50.1	<50
		Max		400	300	250	200	180	160	140	120	100	90	80	70	60	
	Net International Investment Position/GDP	Min	<-350	-299.9	-249.9	-199.9	-149.9	-99.9	-74.9	-49.9	-24.9	0.1	10.1	20.1	30.1	40.1	>40
		Max		-350	-300	-250	-200	-150	-100	-75	-50	-25	0	10	20	30	

Source: own elaboration based on Moody's (2016a, 2016b).

Table 6. Credit conditions scoring.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Private Sector Credit/GDP in % (70%)															
Min	<20	20	25.01	30.01	35.01	40.01	50.01	60.01	75.01	100.01	125.01	150.01	175.01	200.01	>400
Max		25	30	35	40	50	60	75	100	125	150	175	200	400	
Change in Private Sector Credit/GDP (during 3 years; in %; 30%)															
Min	<-30	-30	-19.99	-9.99	-7.99	-4.99	-2.99	0.01	3.01	5.01	8.01	10.01	15.01	20.01	>30
Max		-20	-10	-8	-5	-3	0	3	5	8	10	15	20	30	

Source: own elaboration based on Moody's (2016a, 2016b).

More important impact of the mentioned ratio is the nominal value of the private sector credit to GDP than the change of it. The weight of the first one is 70%, and the second one only 30%. The combination of the mentioned factors is presented on the table 4.

The matrix of the scoring of banks' credit rating macro profile is presented in the table 5 and credit condition scoring on the table 6.

Table 7. Credit Conditions Notching.

Credit Conditions Score								
Banking Country Risk		1	2	3	4	5	6	7
	Very Strong	0	-1	-2	-3	-4	-6	-8
	Very Strong -	0	-1	-2	-3	-4	-6	-7
	Strong+	0	-1	-1	-2	-4	-5	-7
	Strong	0	-1	-1	-2	-3	-5	-6
	Strong-	0	0	-1	-2	-3	-4	-5
	Moderate+	0	0	-1	-2	-2	-4	-5
	Moderate	0	0	-1	-1	-2	-3	-4
	Moderate-	0	0	0	-1	-2	-3	-4
	Weak+	0	0	0	-1	-1	-2	-3
	Weak	0	0	0	0	-1	-2	-2
	Weak-	0	0	0	0	0	-1	-2
	Very Weak+	0	0	0	0	0	-1	-1
	Very Weak	0	0	0	0	0	0	-1
	Very Weak-	0	0	0	0	0	0	0

Source: Moody's (2016a).

Funding conditions are measured by using the following factors:

- market funding measures – measured for example by the LIBOR – OIS spread, which is the difference between a bank borrowing rate (LIBOR) and the overnight indexed swap (OIS)
- central bank balance sheets.

Industry structure factor is measured by Herfindahl – Hirschman indices and the combined domestic market share of the system's five largest banks.

Table 8. Example of Macro Profile Summary**.**

Rating Factors	Sub-Factor Weighting	Indicator	Factor Score
Factor 1. Economic Strength			**VH+**
Growth Dynamics	50%	VH-	
Average Real GDP Growth (2009-2018F)		2.7	
Volatility in Real GDP Growth (Standard Deviation, 2004 -2013)		0.9	
WEF Global Competitiveness Index (2013)		5.1	
Scale of the Economy	25%	VH+	
Nominal GDP (USD bn, 2013)		1502	
National Income	25%	VH+	
GDP per Capita (PPP, USD, 2013)		45138	
Factor 2. Institutional Strength			**VH+**
Institutional Framework and Effectiveness	75%	VH+	
World Bank Government Effectiveness Index (2012)		1.62	
World Bank Rule of Law Index (2012)		1.75	
World Bank Control of Corruption Index (2012)		1.76	
Policy Creditability and Effectiveness	25%	VH+	
Inflation Level (%, 2009 – 2018F)		2.46	
Inflation Volatility (Standard Deviation, 2004 – 2013)		0.81	
Factor 3. Susceptibility to Event Risk (Max. Function)			**L+**
Political Risk			
Government Liquidity Risk			

External Vulnerability Risk			
Banking VS	**Country**		**Risk**
Credit Conditions			
Private Sector Credit/GDP	70%	126	0
3-Year Change in Private Sector Credit/GDP (PP)	30%	-0.2	
Banking System Macro Profile before funding and industry adjustments VS			
Funding Conditions Adjustment			-1
Industry Structure Adjustment			1
Banking VS	**Sector**	**Macro**	**Profile**

Source: Moody's (2016a).

The example of the of macro profile analysis of the process of banks' credit ratings assessment is presented on the table 8. The analysis by using scoring credit rating gives relatively a lot of advantages and disadvantages. A big threat is the possibility of quick obsolescence of the system and the inability to adapt quickly to change. For example, as a result of rapid changes in the economy, you may find that the factors taken to assess as a criterion change, which will lead to the uselessness of the system. Therefore, from modern systems capabilities required to adapt them to changing realities, and the best upgrade so. scoring tables. Many of the problems arises also a selection of evaluation criteria and the appropriate number of points. Some of the criteria can be considered as having no direct impact on the probability of insolvency of the company. Number of points assigned by the system sometimes seems illogical. There is even discrimination against certain groups of operators.

The selection criteria for the evaluation of data collected only from a group of companies, which was awarded a rating. Analyzed is also too small a number of factors examined subject.

Credit rating agencies use the scoring method because of the following advantages:

- Simplicity,
- The homogeneity of the process of credit rating,

- Reducing the number of "bad debtors"
- The possibility of increasing the delegation of powers to the rating,
- The possibility of a flexible policy of rating assessment by management
- Increasing labor productivity.

The result of the estimation banking macro profile and the financial analysis presents table 9.

Table 9. Relation between macro profile and financial analysis.

Financial ratio																
Macro Profile		VS+	VS	VS-	S+	S	S-	M+	M	M-	W+	W	W-	VW+	VW	VW-
	VS+	aaa	aaa	aa1	aa1	aa2	aa3	a1	a3	baa1	baa2	ba1	ba3	b2	caa1	caa3
	VS	aaa	aa1	aa1	aa2	aa3	a1	a2	a3	baa1	baa3	ba1	ba3	b2	caa1	caa3
	VS-	aa1	aa1	aa2	aa2	aa3	a1	a2	baa1	baa2	baa3	ba2	b1	b2	caa1	caa3
	S+	aa1	aa2	aa2	aa3	a1	a2	a3	baa1	baa2	ba1	ba2	b1	b3	caa1	caa3
	S	aa2	aa2	aa3	a1	a2	a3	baa1	baa2	baa3	ba1	ba3	b1	b3	caa1	caa3
	S-	aa3	aa3	a1	a2	a3	a3	baa2	baa3	ba1	ba2	ba3	b2	b3	caa2	caa3
	M+	a1	a1	a2	a3	a3	baa1	baa2	baa3	ba2	ba3	b1	b2	b3	caa2	caa3
	M	a2	a2	a3	baa1	baa1	baa2	baa3	ba1	ba2	ba3	b1	b3	caa1	caa2	caa3
	M-	a3	a3	baa1	baa2	baa3	baa3	ba1	ba2	ba3	b1	b2	b3	caa1	caa2	caa3
	W+	baa1	baa2	baa2	baa3	ba1	ba2	ba2	ba3	b1	b2	b3	b3	caa1	caa2	caa3
	W	baa2	baa3	ba1	ba1	ba2	ba3	ba3	b1	b2	b3	b3	caa1	caa2	caa2	caa3
	W-	baa3	ba1	ba2	ba3	ba3	b1	b2	b2	b3	b3	caa1	caa1	caa2	caa2	caa3
	VW+	ba1	ba3	ba3	b1	b2	b2	b3	b3	caa1	caa1	caa2	caa2	caa2	caa3	caa3
	VW	ba3	b1	b2	b3	b3	caa1	caa1	caa1	caa2	caa2	caa2	caa2	caa3	caa3	caa3
	VW-	b1	b3	caa1	caa1	caa2	caa2	caa2	caa3	caa3	caa3	caa3	caa3	caa3	caa3	caa3

Source: Moody's (2016).

1.2. Standard & Poor's Financial Service

The second credit rating agency that has been taken to the analysis is the Standard& Poor's Financial Service and its banks' credit ratings methodology.

According to the previous researches (Chodnicka 2014, 2015, Chodnicka – Jaworska, 2015 a, b) financial market strongly react on the changes in the S&P's credit ratings. The possibility of the change of the credit ratings leads to the correction on the capital market between 30 to 180 days before the change. The strongest reaction is observed during 30 days before and after the change (Chodnicka – Jaworska 2015a , b).

The previous researches take into consideration the same factors of credit rating assessment for all types of credit rating. The analysis proposed by the Standard & Poor's Financial Service consist of the following steps:

- Business risk assessment
  - Economic risk,
  - Industry risk,
  - Management/strategy,
  - Market position,
  - Diversification,
- Overall financial risk assessment
  - Financial reporting & accounting analysis,
  - Earnings,
  - Financial flexibility,
  - Capitalization,
- Overall enterprise risk management assessment
  - Market and interest rate risk,
  - Credit risk,
  - Liquidity and funding risk.

In the table 10 are presented determinants of the banking macro profile. The presented factors are completely different than those proposed by Moody's Investor Service for the assessment macro – profile analysis. As a result during the comparison between those two types of credit ratings should be taken into consideration all the same determinants or different catalogue for the particular credit rating type.

Table 10. Standard&Poor's macroeconomic profile of banks' credit ratings

Factor	Subfactor adjustments	Additional adjustments
Economic Risk		
Economic resilience	Economic structure and stability Macroeconomic policy flexibility Political risk	GDP per capita

Factor	Subfactor adjustments	Additional adjustments
Economic imbalances	*Expansionary phase* Private sector credit growth Equity prices Current account balance and external debt position or *Correction phase* Expected impact on the banking sector	Atypical change in private sector credit growth or assets prices Commercial real estate prices
Credit risk in the economy	Private sector debt capacity and leverage Lending and underwriting standards Payment culture and rule of law Sovereign government credit stress	Currency movements or price volatility Country specific characteristics
Institutional framework	Banking regulation and supervision Regulatory track error Governance and transparency	
Competitive dynamics	Risk appetite Industry stability Market distortions	
System – wide funding	Core customer deposits External funding Domestic debt capital markets Government role	Non – loan assets

Source: S&P(2013).

The same like in the case of Moody's Investor Service analysis, Standard &Poor's uses the scoring method to verify the banking credit rating risk. In Moody's assessment process is taken 15 numerical and literal scale. In the case of S&P's research each factor is scored on numerical scale from 1 (very low risk) to 6

(extremely high risk). To each risk score are classified the point scale. The score scale is presented in the table below.

Table 11. Scoring factors using by the S&P to analyse the country and banking risk.

Relative risk description	Risk score	Points
Very low risk	1	1
Low risk	2	2
Intermediate risk	3	3
High risk	4	5
Very high risk	5	7
Extremely high risk	6	10

Source: S&P(2013).

For the analytic process each factor receives from 1 to 10 points. Then points are summered and counted on the economic risk or industry score. The presentation of the rescale process is included on the table 12. If the risk is highest, the risk score rises, and if the risk is lowest, the risk score is declined.

Table 12. Determining Economic Risk and Industry Risk Factors

Point total for the three economic or industry risk factors	Economic risk or industry risk score
3-4	1
5-6	2
7-8	3
9-10	4
11-12	5
13-14	6
15-17	7
18-20	8
21-23	9
24-30	10

Source: S&P(2013).

As a result of the estimation process is received a matrix, that is presented in the table 13. The matrix is a combination of economic and industry risk. If the value of score is higher, the risk rises.

Table 13. Matrix of Economic and Industry Risk Score

Industry risk											
Economic risk		1	2	3	4	5	6	7	8	9	10
	1	1	1	2	3	3	4				
	2	1	2	2	3	4	4	5			
	3	2	2	3	3	4	5	5	6		
	4	3	3	3	4	4	5	6	7	7	
	5	3	4	4	4	5	5	6	7	8	9
	6	4	4	5	5	5	6	7	7	8	9
	7		5	5	6	6	7	7	8	8	9
	8			6	7	7	7	8	8	9	10
	9				7	8	8	8	9	9	10
	10					9	9	9	10	10	10

Source: S&P(2013).

In all presented banks' credit rating methodologies is presented the impact of the macroeconomic situation of particular countries on the credit risk assessment. In the presented methodologies, credit rating agencies do not take into consideration the country credit rating. The analysis presented above suggests that banks' and countries' credit rating are strictly connected.

2. Literature review

In current researches the most popular are analyses about factors influencing on the countries and corporate credit ratings. It has been observed the lack of the studies about determinants of banks' notes. In most researches the analysis has been prepared for financial indicators, connected with the liquidity, assets quality,

capital adequacy, management quality and efficiency.[1] In the presented paper will be described the literature review about the impact of the macroeconomic factors and banking sector determinants on the banks' notes.

One of the most important factor that has been taken into consideration to analyse the banks' credit ratings is the GDP growth. The mentioned factor play an significant role during the estimation of the banks' notes. The mentioned opinion has been presented in the researches prepared by Chodnicka-Jaworska (2017). The other opinion has been presented by Bissoondoyal-Bheenick & Treepongkaruna (2011). According to their analyses the macroeconomic variables and market risk factors do not seem to be contributing factor in explaining the banks' credit ratings. Caporale et. al. (2012) verified the impact of the country risk on banks' notes. They found that banks in some countries have systematically higher ratings than others.

The analysis of the impact of the business cycle on credit ratings by taken into consideration the stability of notes has been prepared by Altman and Rijken (2005). The influence of the prosperity and recession has been verified for countires (Giacomino, 2013; Freitag, 2015), banks (Bangia et al., 1999; Fei et al., 2012) and companies credit ratings (Cesaroni, 2015; Isakin, David, 2015; Iannotta et al., 2013). The researches have been prepared mainly for the American market (Amato, Furfine, 2003; Auh, 2013).

Rixtel et al. (2015) found that the "market timing" measured by the low interest rates drove issuance before but not during the crisis. During the crisis funding became more important than its cost. They suggested also that the stronger banks, also form the peripheral countries, receive the better access to longer-term funding markets, even during crisis periods.

The analysis has been prepared also by using the concentration ratio. The mentioned determinant has been measured by the Herfindahl -Hirschmann index or the value of the assets of the biggest three banks to the total value of assets. The researches prepared by Hau et al. (2012) suggests that the concentration ratio play an significant role for the estimation of the banks' credit ratings. The analysis of the mentioned ratio is strictly connected with the "too big to fail" phenomenon.

Wheelock and Wilson (2000) verified the impact of the default risk on the merger and acquisition on the banking sector. They found that inefficiency increases the risk of failure while reducing the probability of a bank's being acquired. The insolvency a bank improve the probability of the acquisition.

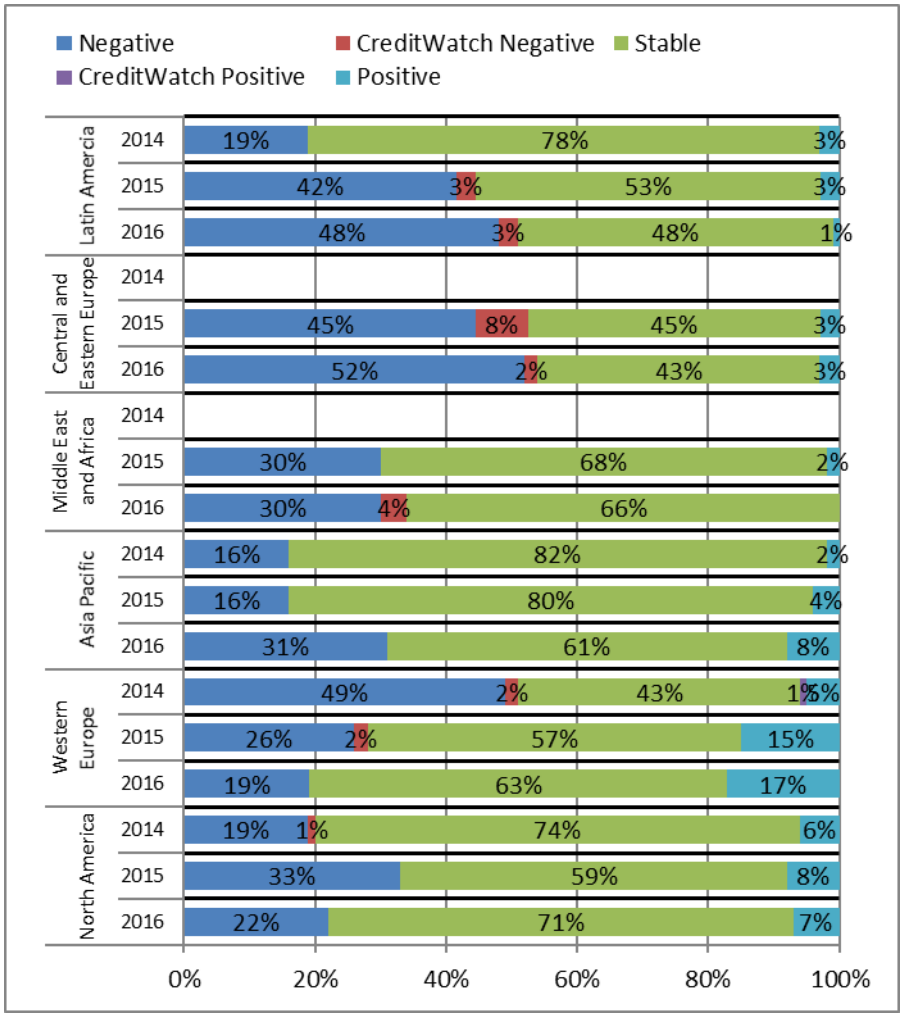
[1] Shen et al. (2012), Bellotti et al. (2011a; 2011b), Bissoondoyal-Bheenick & Treepongkaruna (2011) Ötker-Robe & Podpiera (2010), Hassan & Barrell (2013), Poon et al. (2009), Hau et al. (2012).

As a result the next step of the research relies on the analysis of the condition of the banking by taking into consideration notes that are prepared by three biggest credit ratings agencies for countries.

3. The analysis of the condition of the banking sector.

The analysis of the condition of the banking sector has been started on the presentation of trends on notes that are given for banking sector by S&P. The results of analysis has been introduced in the table 14.

Table 14. S&P banking sector credit ratings trends.



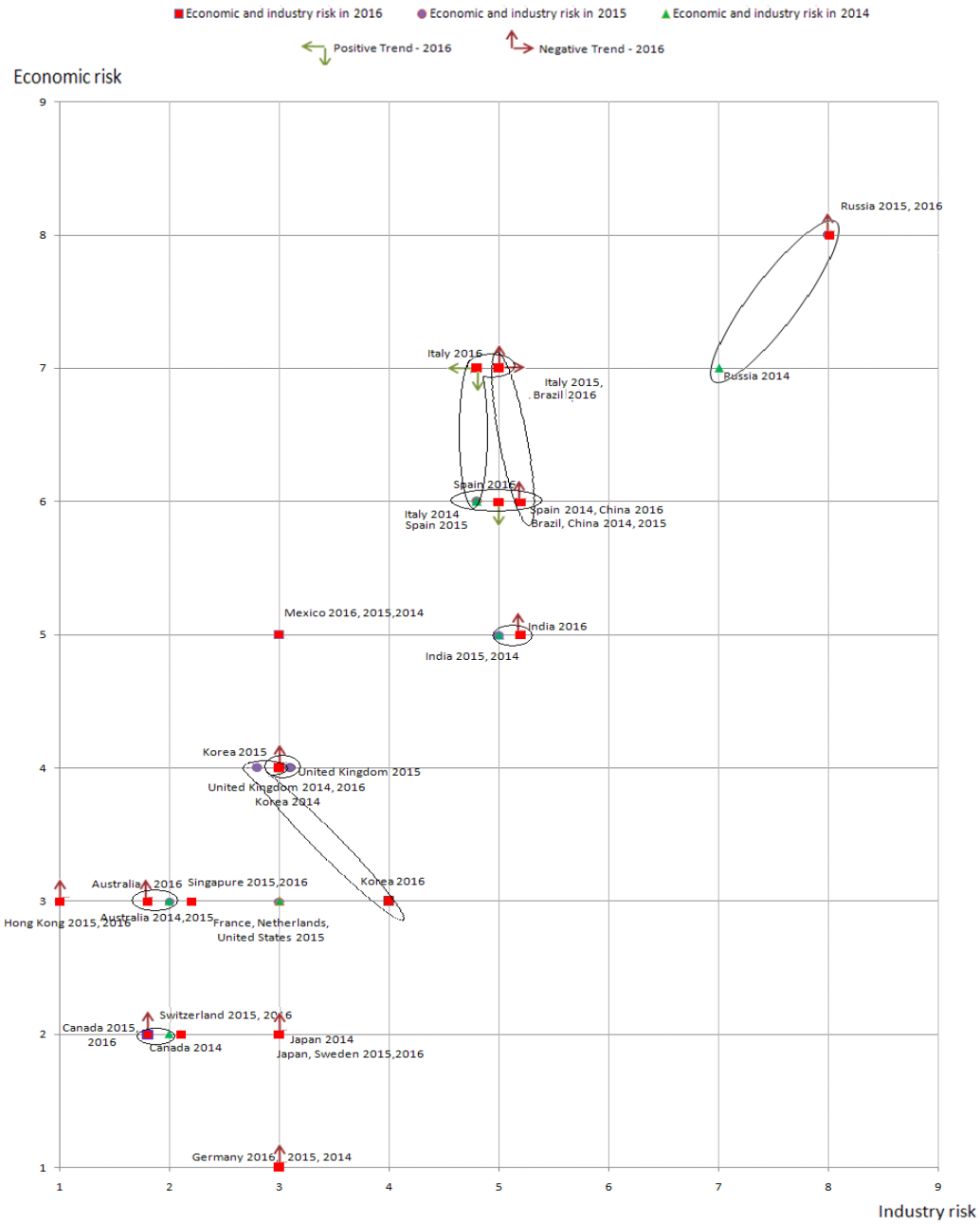
Source: own elaboration based on S&P (2014, 2015, 2016).

The analysis of banks from Latin America suggests that the mentioned institutions are threaten as more risky in 2017 than it was in 2015. The proportion of the negative outlooks and reduction of the positive notes. The same situation has been

observed for banks from the Central and Eastern Europe and Asia Pacific. In the case of Middle East and Africa the situation is stable. Banks from Western Europe and North America are threaten as more stable than in previous years. The main aim of the paper is to analyse the condition of the banking sector in Europe, as a result the broader analysis will be presented for the mentioned area.

The prediction of the World Bank and International Monetary Fund suggest that Western Europe countries will have got problems with the modest economic growth and increasing level of the political risk. This situation can be connected with the Brexit negotiations. In most of the mentioned countries are also planned the elections. The analysis of the risk of the activity of banks presented in the figure 2, suggest that banks will have got problems in a three areas. The first of them is the low profitability of their business models. There have been also presented ideas of the restrictive regulatory requirements. The interest rates are also still low, in most cases below zero. The toxic assets that have got Spanish, Ireland, Italian and Portuguese banks will also create problems on the financial market. The instable situation on the financial market can create encourage the ECB to purchase bonds. Low interest rates can help to maintain the low borrowing costs. On the other hand they will reduce the possibility of increase the earnings. As a result banks can take more risky decisions to create profits. The mentioned situation can create pressure from stakeholders. Some of banks like Commerzbank, ING or Lloyds presented in last months the downsizing plans. The expected ROE for the biggest 50 banks is 6% (S&P, 2016). On the other hand the cost of the capital is estimated on 10%. The described gap will create consolidation moves. This situation can be observed in the case of German France, Italy or Spain. It can be noticed the digitalization trend, especially in Nordic banks. Banks will also have problems with the regulations changes, like such as Basel's pending refinements of capital requirements, including changes to enhance comparability of RWAs, the final design of the long-term funding requirements and leverage ratio, and MREL requirements (S&P, 2016).

Figure 2. S&P Economics and industry risk relationship.

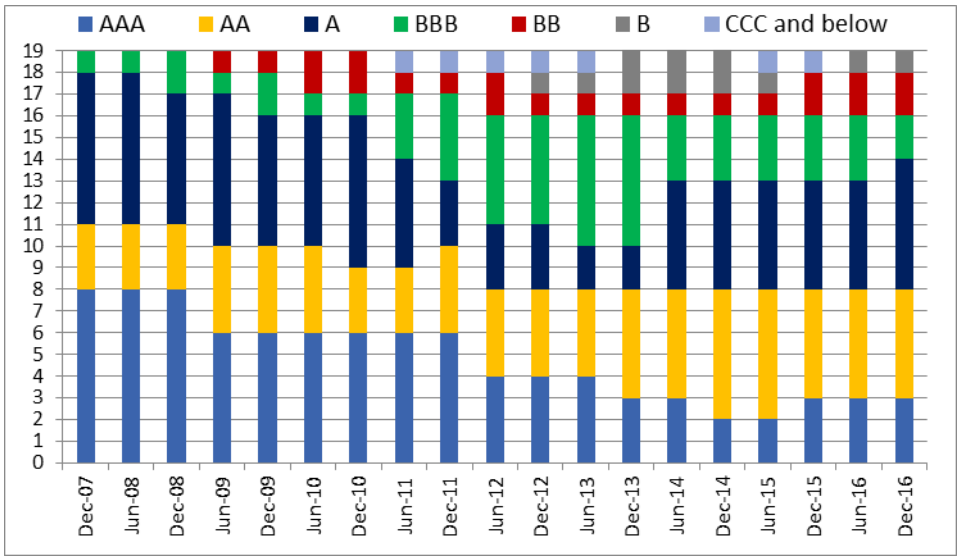


Source: Own elaboration based on S&P (2014, 2015, 2016).

The analysis of country's credit ratings of the European Union suggests that the macroeconomic risk of the banking sector in the presented countries rose during the last years. At the moment the relation between the investment and speculative

notes is better than in previous year. The mentioned relationship confirm the hypothesis that has been put at the beginning of the paper.

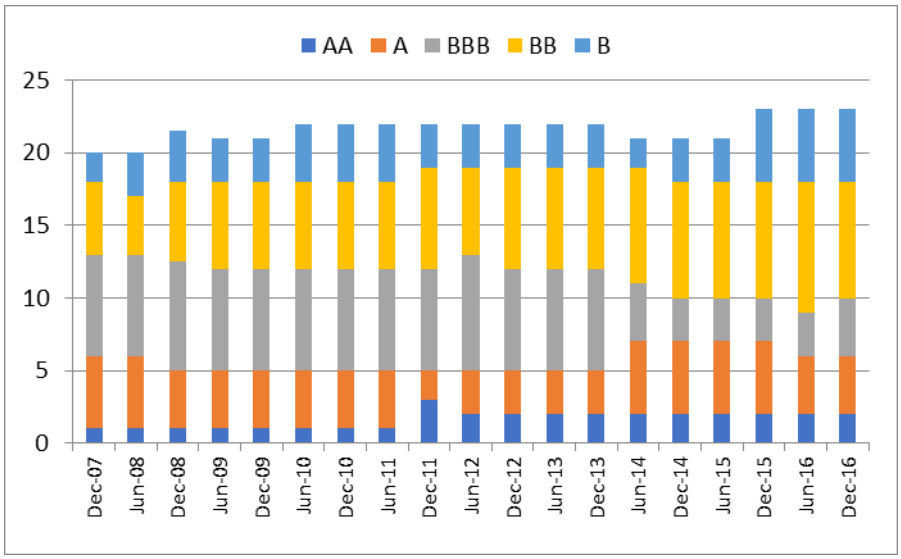
Table 15. European Union credit ratings changes presented by S&P .



Source: S&P (2016b).

Banks form the CEE area has been in the similar situation. The same like Western Europe banks, Russian financial institutions are under pressure to adjust their business model to a low-growth and high-risk environment. On the other hand the situation on the financial market of Russia can also influence on the banks' notes. The World Bank and IMF assume the modest rise of the GDP, interest rates and consumption growth. The positive macroeconomic environment should influence positively on the condition of banks from Hungary, Slovenia, or Czech Republic. The opposite situation can be observed in the case of the Bulgarian and Croatian institutions, because of the high value of the nonperforming loans. On the other hand in Poland the bank asset tax and increasing regulatory costs will reduce the banking sector notes.

Table 16. Central and Eastern Europe credit ratings changes presented by S&P .



Source: S&P (2016c).

According to the S&P opinion the same like in the case of the European Union banking sectors, in the CEE will be observed the concertation trend. The mentioned situation can increase pressure on private banks to generate higher profits. In Russia has been observed the trend of the reduction of the smaller players, and higher risk for banks. The sanctions will also influence negatively on the condition of the banking sector. Russian banks received during 2014 – 2015 period of time support from the authorities, as a result the situation on the capitalization and liquidity of sector has been stabilized. Few private banks can have been identified as systemically important.

Banks in CEE continue to improve their benefits on the domestic market. Czech and Romanian banks are in a stable position, while the condition of the Hungarian institutions will be decreased because their profitability. Slovakian banks will also benefit from more favourable business environment. Banks in Bulgaria and Slovenia will increase their assets quality, connected with the condition of the nonperforming loans. In the case of the Polish banks the concentration on the banking sector will increase the profitability. The changes in the banking sector opinion has been presented in the table 17.

Table 17. Central and Eastern Europe banks' credit ratings changes presented by Fitch .

	POL	**CZE**	**SLK**	**HUN**	**BUL**	**ROM**	**SLN**
BSI	bbb	a	WD	bb	bb	bb	bb
Rating Outlook	•	•	•	•	•	•	•
Sector Outlook	•	•	•	•	•	•	•
Asset quality	bbb	a	bbb	b	bb	bb	bb
Trend	•	•	•	•	•	•	•
Profitablility	bbb	a	a	b	bb	bb	b
Trend	•	•	•	•	•	•	•
Capitalisation	bbb	a	a	bb	bb	bb	bb
Trend	•	•	•	•	•	•	•
Funding	bbb	a	a	bb	bb	bb	bb
Trend	•	•	•	•	•	•	•

Source: Fitch (2017).

Conclusions

The analysis of the condition of the banking sectors in European Union and the Central and Eastern Europe confirm the hypothesis, that the banking sector credit ratings are strictly connected with the country's notes. The presented findings and the current analysis of the methodology used by the biggest three credit rating agencies suggest that in most cases the three factors are taken into consideration. The first of them is the GDP growth. The next one is the concertation ratio of the banking sector. The significant impact has got also the value of the interest rates. Credit rating agencies during the presentation of the outlooks of the banking sectors notes verify also the financial condition of the presented institutions. The main group of factors that are taken into analysis are asset quality, profitability, capitalization and funding indicators. Because of the lack of data connected with the estimation of the outlook trends, it cannot be prepared the statistical and econometrical analysis for the whole banking sector. It can be prepared the verification of the condition of the particular bank. It should be obligation to publish trends by credit rating agencies. The mentioned situation will help to analyse the risk of the banking sector.

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A PARADIGM SHIFT IN TURKISH-AZERBAIJANI RELATIONS? RESULT FOR TURKISH ARMENIAN RECONCILIATION PROCESS BETWEEN 2008 AND 2010

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Abstract
Turkish-Azerbaijani relations have been almost unique since the dissolution of the Soviet Union. Turkey has sustained special relationships with the newly independent Azerbaijan since the 1990s. These relations are grounded in linguistic and cultural characteristics, as well as common interests. Despite mutually very close ties, Turkey and Azerbaijan have entered an extra ordinary period regarding Turkish-Armenian Protocols in 2009. Azerbaijan almost abandoned her traditional diplomacy that requires a balance between Turkey and Russia, and moved to a new foreign policy concept predominating towards Russia. This different kind of partnership became especially important when the Turkish government initiated policies on the normalization of relations with its neighbor, Armenia.
If we consider that the bilateral relations between Turkey and Azerbaijan have been unique until Protocols established, how should we analyze the paradigm shift in Azerbaijan? In this framework, some questions should be taken into consideration: Was Azerbaijan a real partner for Turkey and was Turkey a vital bodyguard for Azerbaijan? And were bilateral relations between these states as important as supposed for many years?
This paper examines the possible dimensions of the relations between Turkey and Azerbaijan. From the historical perspective to Turkish-Armenian Reconciliation process, Turkish-Azerbaijani relations are underlined. In this paper, these complex questions and the pros and cons of their relations will be investigated in the light of Protocols and results.

Key words: Turkey, Azerbaijan, economic and political relations

JEL Classification: F15, P48, N95

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Introduction

Despite common declarations of fraternity, Turkish-Azerbaijani relations have a relatively short history, notwithstanding bilateral diplomacy during the period of Mehmet Emin Resulzade`s Azerbaijan Democratic Republic, which became the first democratic state in the Muslim world between 1918-1920. At that time, the fading Ottoman Empire attempted an unsuccessful movement to re-establish control over the territory of present-day Azerbaijan following the first World War. From the founding of the Republic of Turkey until 1991, Azerbaijan had been considered a part of Soviet Turkestan in the eyes of Turkish people, and state elites had limited knowledge about this country during the Cold War.

After the Soviet Union collapsed, Turkey became the first country to recognize Azerbaijani independence in January 1992, and established full diplomatic ties within a year. During the era of Ebulfeyz Elchibey, Baku stressed fundamental relations with Turkey in accordance with the personal efforts of Turgut Özal who was president of Turkey when the USSR dissolved. Özal had been a passionate advocate of Azerbaijan until his death in mid-April 1993, while Elchibey, along with pan-Turkic ideologues in the Popular Front regime was an ardent supporter of the expansion of Turkish influence in Azerbaijan.

When Haydar Aliyev consolidated political power after the removal of Elchibey in 1993, Turkish state elites subsequently expressed a willingness to continue cordial relations. Yet, relations between the two countries became a bit subdued during Aliyev's presidency, as he sought to develop pragmatic relations with Russia and Iran, which ranged from stagnant to hostile during Elchibey's period in office. Aliyev's more realistic policies started to reshape his country's domestic politics and foreign relations after he gained control of leading institutions in Azerbaijan. Furthermore, due to its size, population and energy resources, Azerbaijan became the most important country in the South Caucasus, a trend which was already anticipated during his presidency.

Both post-Özal and post-Elchibey era in the two countries coincided with a similar process in their domestic systems. While Turkey had experienced a long period of internal instability until 2002, Azerbaijan witnessed relative political stability with the monopoly over governing institutions by Aliyev`s family. In this sense, it could be argued that an autocratic regime or political instability eventually complemented one another. Despite the unique conditions experienced by the two states, they both improved their diplomatic and economic ties with each other. These new conditions

were dependent on the mutual introduction of realistic political and economic initiatives.

On the other hand, when the new Turkish government opted for normalization of its relations with Armenia during 2009, Azerbaijan began to seek various alternatives for regional projects. That was almost first experience for bilateral relations which exhibited a kind of turbulence. This paper seeks to analyze the basic features of Turkish-Azerbaijani relations from independence in 1991 to the year of 2010, and to identify the possible causes of the shift in their diplomatic relations.

1. The Place of Azerbaijan in Turkey: 1991-2010 Period

In the post-Soviet era, Azerbaijan regained its independence, while Turkey`s political environment has changed in both its domestic situation and foreign relations. Throughout the 1990s, Turkish foreign policy was much more ideological and identity-based, yet has become more pragmatic since that time. This shift in orientation is particularly evident in Turkey's relations with Azerbaijan and the newly independent republics of Central Asia. In the early 1990s, Turkey attempted unsuccessfully to play a "big brother" role toward these republics. In contrast, among the post-Soviet nations, Azerbaijan presented a unique opportunity for Turkey`s new political shift beginning in 2002, because of its geographical proximity, hydrocarbon reserves and common cultural characteristics (Öniş&Yılmaz 2009: 8). In this case, Turkey`s relations with Azerbaijan were both historically friendly and grounded in more pragmatic mutual economic and political interests.

Since the 1990`s, Turkey and Azerbaijan have developed their common ties despite some obstacles. Turkey has been one of the biggest trading partners for Azerbaijan for at least two decades. Total trade volume has permanently increased for the last ten years from $0.3 to $2.1 billion dollars until 2009 (UN, 16.05.2010). At the same time, Turkey is the biggest investor in the non-oil and gas sectors in Azerbaijan with $2.1 billion dollars in between 1993 and 2005 (Turkish Embassy in Baku, 2005).

Turkish export products to Azerbaijan have mainly consisted of industrial goods, such as foodstuffs, textiles, construction materials, communications technology, electronics, automobiles, and raw materials. The GSM company, the country's largest firm, is owned by Turkish entrepreneurs, who are also very active in banking and transportation. Because of this dynamism, between 2003 and 2012, Turkish construction companies undertook projects worth $8 billion in Azerbaijan's rapidly developing infrastructure (Kardaş&Macit, 2015: 41).

Although it has not invested substantially in the oil and gas sector in Azerbaijan, Turkey`s energy needs could also be considered as an important factor in their bilateral relations. Turkey`s energy production has become more dependent on oil and especially natural gas for the last ten years. The Baku-Tbilisi-Ceyhan (BTC) pipeline became operational in 2006 and Turkey has been purchasing 6 bcm/year natural gas from Azerbaijan since 2007 (BOTAŞ, 15.02.2007). Among other gas purchase agreements, this deal was more advantageous for Turkey`s energy policies than other contracts because it has provided some additional privileges to export this amount.

In fact, Azerbaijan has concluded 28 production-sharing agreements with different oil companies, mostly western-owned firms. The BTC pipeline has a maximum transit capacity of one million barrels per day. A parallel Baku-Tbilisi-Erzurum (BTE) gas export pipeline opened in September 2006, and in October 2008, the first tanker carrying oil from Kazakhstan's Tengiz field departed for Azerbaijan. New pipeline and delivery route systems, such as Nabucco, which is a proposed natural gas pipeline project through the southern corridor to Europe are currently being considered and negotiated (US Department of State, 02.02.2011). On the other hand, Turkey`s interests to diversify its gas supplies have extended to Turkmen gas reserves since 1999, when Turkey and Turkmenistan concluded a purchase agreement. According to this agreement, Turkey would buy bcm/year of Turkmen gas, and another 14 bcm/year would be transported to Central Europe along a pipeline extension running through Turkey. Azerbaijan was located at the center of that project, which was called the Trans-Caspian Natural Gas Pipeline.

From a realist geopolitical perspective, Turkey`s main concerns towards Azerbaijan consist of four elements. These are as follows: limiting Russian influence in the region; decreasing Iranian Islamic propaganda effects in the country; increasing nationalist ties with Azerbaijan; and finally, looking for economic benefits of new investment areas and utilizing hydrocarbon reserves of that country (Sadri, 2003: 186). In addition, Turkey closed its Armenian borders to implement the previously signed declaration of friendship and cooperation with Azerbaijan in June 1993. Since then the borders between Turkey and Armenia have remained closed because of the Armenian invasion of Azerbaijani territory. However, as Turkey has followed open and liberal economic policies since 1980, this decision has eventually proven to be unrealistic and opposite to the policies implemented in today's globalized world. Turkey has consequently ignored Armenia`s importance as a neighbor and prioritized its ties with Azerbaijan and Georgia in the Caucasus region.

Thus, Turkish-Azerbaijani relations from the political and economic perspective have depended on a variety of several factors. These include new foreign policy instruments introduced by Turkey's ruling Justice and Development Party (AKP) and regional projects both implemented and proposed in the Caucasus and Caspian Basin as well as the historical background of the relations between the two countries. These historical ties consist also of political, military, educational, and regional prospects.

Firstly, with respect to the international summits of Turkish-speaking countries, Turkey and Azerbaijan have played a crucial role. Seven out of ten of the Turkic summits have been held either in Turkey or in Azerbaijan. In the 9th summit that was held in the Nakhchivan Autonomous Republic in 2009, the leaders decided to establish a permanent body for further cooperation between Turkic states. In the 10th Turkic Summit which was held in in Istanbul on September 15-16, 2010, Turkish president Abdullah Gul declared that they are from now on "one nation, but also six states", in a takeoff on Heydar Aliyev's original "one nation, two states" slogan describing the relationship between Turkey and its close ally, Azerbaijan (Lomsadze, 05.02.2011).

Secondly, military cooperation between the two states (i.e. the establishment of the Azerbaijan-Turkey Military Pact in 1992) is another important factor in their relations. Although Turkey has not been officially involved in the Caucasus Wars including the Nagorno-Karabakh conflict, military cooperation between the two states was in their minds since end of the Karabakh War. In 1998, General Cevik Bir, Deputy Chief of Turkey's General Staff declared: "Students from these countries are trained in our military colleges in order to adapt them to western systems and practices. Approximately 2,300 students have graduated from Turkey's military colleges and another 1,700 students continue their training" (Bir, 1998). The phrase "these countries" mostly referred to Georgian and Azerbaijani students, as well as those from certain Central Asian republics.

Moreover, prominent Azeri State Advisor for Foreign Affairs Vefa Guluzade had called for the US and Turkey to take the initiative to create a NATO-run military base in Azerbaijan in 1999. In 2002, Azerbaijan formally announced its pursuit of candidacy to join the Alliance through the Individual Partnership Action Plan (IPAP). At the same time, Baku has sought to maintain a balance in its security relations between East and West. Moscow continues to operate a military station for radio monitoring and early warning at Gabala in northern Azerbaijan (Nation, 2007: 16). The policy of East-West balance is very important for the country because of Russia`s crucial role in managing the Karabakh problem. Despite limitations for

closer relations, Turkish military assistance to this country exceeded $200 million as of 2010 and Azerbaijan plans to take part in the ATAK helicopter project, which is currently a joint venture between Turkey and Italy.[1]

Third dimension of the place of Azerbaijan in Turkish foreign policy has depended on the regional projects that could accelerate bilateral cooperation in the region since the 1990s (Dikkaya&Özyakışır, 2008: 93-118). As a result of regional cooperation efforts between Azerbaijan, Georgia, and Turkey in oil and natural gas connections such as the BTC Oil pipeline (from Baku to Ceyhan) and South Caucasian Natural Gas Pipeline, also known as the Southern Corridor for natural gas transportation (from Baku to Erzurum) are active. It is expected that the Kazakh contribution to BTC oil pipeline and the Turkmen contribution to Southern Corridor through the Trans-Caspian natural gas pipeline which was signed in 1999. This regional cooperation project would develop with the possible implementation of Nabucco Natural Gas Project and Kars-Tbilisi-Baku (KTB) railroad project.

Additionally, Turkey supported Azerbaijan in its intentions to become a member of regional organizations, such as Economic Cooperation Organization (ECO), Black Sea Economic Cooperation Organization (BSEC), and Organization of Islamic Countries (OIC) in the early years of the independence. These regional initiatives expanded Turkey's regional influence especially towards the Caucasus and Central Asia. Membership in the ECO and OIC provided Azerbaijan with increased international recognition among Muslim states. In addition to multilateral relations, Turkey`s efforts to build new energy routes via Georgia became Azerbaijan important. Final step in this cooperation was a trilateral agreement between three states in Caucasus is the KTB railroad project, which is still under construction. In many ways, this project reflected a case study in regional self-reliance without having any direct Western or US financial support (Ismayilov, 20.02.2010).

Fourth factor is clearly business relations and trade/capital flows mostly from Turkey to Azerbaijan. Trade data and its components demonstrated that Turkish-Azerbaijani trade relations had been growing since the beginning of independence. Trade relations and the effects of interest groups are very crucial in developing relations. Furthermore, capital flows from Turkey to Azerbaijan and possible Azeri investments in Turkey, such as the construction of the Heydar Aliyev oil refinery in Ceyhan, are the basic arguments for Turkish investors` role in the establishment of an Azerbaijani market economy.

[1] "Turkey-Azerbaijan Military Cooperation Deepens to the Tune of $200 Million", http://www.artsakank.com.cy/en/news/general/2010/turkey-azerbaijan-military-cooperation-deepens-tun (13/01/2011).

Another important instrument regarding the capital/human flows has been the Turkish human capital investments in Azerbaijan. This development has expanded the influence of Turkish language in Azerbaijan as well as in other post-Soviet Turkic countries. Because of the efforts of the state elites and the civil society movements; Turkey has opened Azerbaijani Turkish-language schools, including Islamic schools, and has trained Azeri students in its universities and colleges. Turkey hopes these students will return to their native countries to constitute a Turkish-speaking professional class that will replace the traditional Russian-speaking political and economic elite. An important instrument for achieving this goal is the establishment of Turksat, which beams Turkish TV programs to Azerbaijan via satellite (Hunter, 2001: 9-10). Turkey has also demonstrated the role of educational exchange as a foreign policy tool since the mid-1990s. Turkish policy makers thought that educating today`s students meant creation of the elites who would later oversee the transformation towards a market economy and democracy in their native countries (Yanık, 2004: 293-294).

Thousands of Azerbaijani students have graduated from Turkish universities and have been employed at different places and positions in the country, and thousands of students have received education from both public and private companies in Azerbaijan since the beginning of independence. Turkish trainers working in Azerbaijan are actually continuing a historical responsibility. Turkish schools that are as old as Azerbaijan's independence are playing an important role in the country`s struggle for a brighter future. On the other hand, there are significant numbers of Azerbaijani students studying in Turkish universities whom have been organized in lobbying activities (Goksel, 2008: 124).

In another word, Turkey has made a link between education and creating a common Turkish identity with respect to educational and exchange programs, which have been implemented since the collapse of the USSR. Azerbaijan responded positively to Turkish initiatives and it has been the good example of the mutual commitment to social development since independence.

2. The Place of Turkey in Azerbaijan: 1991-2010 Era

Since 1994, Baku has pursued four major policy goals. The most important aim is to facilitate economic development by exporting oil products. Second, Baku intends to decrease its traditional dependence on Russia. Third, state elites of this country intend to strengthen its power base economically and militarily to regain its lost territory. Finally, Azerbaijani leaders` self-image of their republic is a secular one (Sadri, 2003:

187-188). To achieve each of these goals, either directly or indirectly, Turkey has been a good strategic partner for Azerbaijan. As previously mentioned, Turkey helped the country as much as possible when it was in chaos and had security problems at both the domestic and international level.

Table 1: *Azerbaijan-Turkey "High Politics" Diplomatic Portfolio 1991-2010*

Date	***Instrument Type***	***Issue Area***
24/1/1992	Agreement	Friendship, Collaboration and Neighbourship
28/2/1992	Protocol	Cooperation
?/?/1992	Treaty	Mutual Military Training
2/11/1992	Agreement	Cooperation and Solidarity
9/2/1994	Treaty	Friendship and Comprehensive Collaboration
9/2/1994	Protocol	Cooperation and Mutual Assistance
9/2/1994	Agreement	Political Consultations
4/10/1994	Agreement	Cooperation
10/6/1996	Treaty	Military Training, Technical and Scientific Areas
31/10/1996	Protocol	Cooperation of Armed Forces Support Staff
5/5/1997	Statement	Expansion of Strategic Collaboration
8/9/1997	Agreement	Cooperation and Political Consultations
24/7/1999	Treaty	Military Grant to Armed Forces
16/5/2000	Agreement	Military Grant
28/2/2001	Agreement	Military Grant
22/3/2001	Protocol	Development of Nakhchivan 5th Army
14/5/2002	Agreement	Military Grant
29/8/2003	Protocol	State Border Service Assistance
25/6/2003	Agreement	Military Grant
3/4//2003	Protocol	Cooperation of Military Intelligence
23/7/2003	Protocol	Safety of the West-East Energy Corridor
13/4/2004	Agreement	Long-Term Economic and Military Cooperation
22/6/2004	Agreement	Military Grant
6/6/2005	Agreement	Military Grant
14/7/2006	Agreement	Military Grant
26/2/2007	Duty Instruction	High-Level Azerbaijan-Turkey Military Dialogue
13/7/2007	Agreement	Military Grant
6/11/2007	Agreement	Partnership and Cooperation

***Source*:** Republic of Azerbaijan Ministry of Foreign Affairs

Table 1 below presents a summary of bilateral diplomatic instruments in "high politics", or vital security and economic areas, concluded between Baku and Ankara between 1991 and 2010. This data demonstrates the prevalence of direct military aid and security assistance in Azerbaijan-Turkey relations.

On the other hand, following independence, Azerbaijan found itself located in the center of the Russian-Turkish-Iranian geopolitical triangle, consisting of historical and religious ties with Iran; ethnic, ethno-linguistic and traditional intellectual links

with Turkey; and political, intellectual and linguistic ties with the Russian Federation. Therefore, observers have often suggested that Azerbaijani foreign policy instruments must be continually calibrated in order to maintain an effective balance between them (Mehdiyeva, 2003: 271). Since the beginning of independence, the country had changed presidents only four times in twenty years. While the first president, Ayaz Muttalibov had continued to rely on Russian support (between September 1991 and March 1992), the second president Elchibey pursued Westernization through unity with Turkey (between June 1992 and August 1993). Finally, in October 1993, Haydar Aliyev, who became the third president of Azerbaijan until October 2003, introduced the "balanced" foreign policy doctrine, which sought to reinforce national sovereignty and autonomy by establishing positive diplomatic relations with each of the global and regional powers.

In fact, Muttalibov paid the political price for his clear Russian-oriented policies while Elchibey reaped the cost his anti-Russian and anti-Iranian approaches. Moreover, because of imbalanced policies, Azerbaijani territory was invaded by Armenia, while the country faced separatist movements such as the Lezgin resistance in the north and the attempted Talish secession in the south. Furthermore, within the first six months of Haydar Aliev's presidency, despite being the strongest president of the republic since independence, Azerbaijan lost a significant portion of its territory (Aslanli, 2010: 140).

For more than two decades, nearly all presidents in Azerbaijan have faced the security dilemma of preserving the stability of their regimes through the conflict over Karabakh, whereas the outcome of the Karabakh War has been a primary threat to the internal stability of the entire country. The political survival of Azerbaijan`s presidents have been determined by this conflict since the beginning of independence. Hence, the Karabakh conflict remained critical in determining priorities in Baku`s foreign policy. Moreover, it needed to begin oil exports to increase its revenues. A wealthier Azerbaijan could support a modern army, which in turn would enable greater leverage against Russia and Armenia. However, exporting oil from the landlocked Caspian region through Russia would increase Russia's leverage over Azerbaijan (Ipek, 2009: 229-30).

The Karabakh War with Armenia brought Azerbaijan dramatic results with refugee problems (almost 1 million people), casualties (nearly 20 thousand) and disabled people (more than 50 thousand) in addition to the economic cost of war and the loss nearly %20 of its total surface area, at the same time. One could say that the war on Karabakh against Armenia and its consequences in Azerbaijan became closer to

Turkey. Elchibey defended anti-Russian and anti-Iranian policies during his relatively short presidency, strongly refused Russian demands for the return of its military bases and control over Azerbaijan's energy exports, and endorsed pan-Turkism as the ideology of the Azerbaijan Popular Front.

Additionally, Russian demands were perceived as unacceptable for the sovereignty of an independent country. Thus, Russia provided support to the Armenian side and the shift in the balance of power toward Armenian forces led to battlefield victories over Azerbaijani forces.

Elchibey initially achieved some success in the war and gave priority to developing a strategic partnership with Turkey, and considered radical solutions to overcome Azerbaijan's security dilemma. He also prioritized expanding contacts with the West as a key factor in strengthening national independence. Accordingly, Elchibey's administration set a pro-Western course for Azerbaijan's foreign policy. The country's rich oil resources were an important policy instrument (Ipek, 2009: 231). Because of pro-Western and pro-Turkish policies, he gave large priorities to European, US, and Turkish oil companies and excluded Russia from oil contracts.

Naturally, the clear opposition to Russian influence through its remnant Soviet army and national oil companies brought Azerbaijan internal chaos and instability in addition to the loss of Karabakh, including areas of Azerbaijani territory outside of the Karabakh enclave. Power struggles initiated by local militia leader Surat Huseyinov in Baku coincided with the withdrawal of Russian troops from Ganja. Moreover, with the support of the Armenian diaspora in the US, Azerbaijan was excluded from US foreign assistance under Section 907 of the Freedom Support Act beginning in April 1992 until the waiver policy introduced in 2001. Armenian forces took further advantage of the ferment in Azerbaijan and occupied several districts neighboring Karabakh. A dramatic refugee problem started with the Lezgin minority`s uprising in the northern provinces. In the summer of 1993, Azerbaijan was in chaos and threatened to collapse into a multitude of regions fighting against the central authorities in Baku.

After some domestic struggles between his base of support in Nakhchivan and the Elcibey government in Baku, Haydar Aliyev gained power in a short time. His foreign policy opted for closer relations with Russia. Aliyev visited Moscow and agreed to rejoin the Commonwealth of Independent States (CIS) in September 1993. He also invited the Russian Lukoil to join the oil projects in its Caspian offshore fields. Consequently, a 10% share of the State Oil Company of Azerbaijan Republic

(SOCAR) was transferred to Lukoil. Aliyev's strategic approach toward Russia was to gain its support, particularly with regards to the Karabakh conflict. Although a cease-fire was signed in May 1994 between the two Caucasian countries, Armenia controlled the Karabakh region and seven other districts of Azerbaijan between Karabakh and the territory of Armenia. Table 2 below indicates the extent of efforts to engage in security and economic cooperation with Moscow since the late 1990s, despite fundamental disagreements with its regional policies.

Table 2: *Azerbaijan-Russian Federation "High Politics" Diplomatic Portfolio 1991-2010*

Date	*Instrument Type*	*Issue Area*
6/10/1992	Agreement	Activity of Border Armies of Russian Federation
12/10/1992	Contract	Friendship, Cooperation and Mutual Security
3/7/1997	Agreement	Friendship, Cooperation and Mutual Security
3/7/1997	Protocol	Azerbaijan/Russia Military Cooperation
14/6/2000	Protocol	Azerbaijan/Russia Security Council Cooperation
25/12/2000	Agreement	Personnel in Military Education Enterprises
9/1/2001	Joint Declaration	Foundations of Cooperation in Caspian Sea
25/1/2002	Agreement	Terms of Use of Gabala Radar Station
25/1/2002	Contract	Long-Term Economic Cooperation (to 2010)
23/9/2002	Agreement	Allocation of Border Areas of Caspian Sea Bed
23/9/2002	Agreement	Mutual Activity and Cooperation of MNS/FSB
27/2/2003	Agreement	Military and Technical Cooperation
6/2/2004	Declaration	Friendship, Cooperation and Mutual Security
4/4/2008	Agreement	Terrorism, Illicit Trafficking and Organised Crime
3/7/2008	Declaration	Friendship and Strategic Partnership
30/6/2009	Agreement	Natural Gas Supply

***Source*:** Republic of Azerbaijan Ministry of Foreign Affairs

Haydar Aliyev's long-term strategy was to attract multiple countries' investment in the oil and gas sector in order to strengthen national security. The investment of various energy companies from the US and Europe was sought to catalyze the formation of an international pro-Azerbaijani lobby to bolster Azerbaijan's position in the Minsk Group, the primary diplomatic platform for negotiations on the Karabakh conflict. Strengthening Azerbaijan's independence and national security always has been at the core of Azerbaijan's foreign policy despite periodic swings under four different presidents between 1992 and 2003. The harnessing of its rich oil resources and relations with Western oil companies were an important policy instrument in achieving these foreign policy goals.

Like geopolitical variables, economic factors have led Azeri elites to establish closer ties to the West (via Turkey), while maintaining a working relationship with Russia. In addition to these variables, Azerbaijani foreign policy is based on the predominant role in formulating and implementing of the central leadership. With the accession to

the presidency of Heydar Aliyev in 1993, the leadership issue allowed the country to pursue in such that way (Sadri, 2003: 182).

Azerbaijan looked upon Turkey, in its short history, as its closest partner in the region because of common, ethnic, linguistic and cultural ties. It has also benefited from participating along with the Central Asian Turkic states in Turkic Summits that were sponsored by the Turkish government. Turkey has offered Azerbaijan credits, aid and various kinds of technical assistance in order to create a market economy and to build its democratic institutions. Azerbaijan has also become more important to Turkey in recent years because of its oil and gas reserves and of its geographical location as an important transit country on east-west energy and transportation routes avoiding Russia and Iran (Winrow, 2000: 8).

3. A Paradigm Shift Between Turkey and Azerbaijan Regarding Turkish Protocols with Armenia?

Could it be argued that the Turkish-Azerbaijani honeymoon ended regarding Turkish Protocols with Armenia? If we consider the past as given, this would be difficult to suppose. If, however it can be questioned, what kinds of disputes are there between the two nations? Despite Turkey`s efforts to become a strategic partner for Azerbaijan, the two countries have already experienced some problematic issues since the presidency of Haydar Aliyev.

First of all, the personalist leadership of Aliyev and his presidency (together with the son Aliyev`s administration) in Azerbaijan shaped the country's approach to domestic and foreign policy. Because of his policies, today's Azerbaijan is less democratic, less respectful of human rights, and less clear in its foreign policy goals. Haydar Aliyev and his family established an authoritarian and patrimonial political regime in Azerbaijan. As Winrow has suggested, Aliyev was more circumspect in his diplomacy towards Turkey than his immediate predecessor Elchibey (Winrow, 1996: 132). Many entrepreneurs and visitors have witnessed such policy towards Turkish citizens when entering the country during the years of Protocols crises. Following days of the declaration of initiatives on the normalization of the relations with Armenia, Turkish officials and Turkish citizens started to perceive that they were regarded as important enemies in Azerbaijan. These perceptions mainly resulted from Baku`s rapid signals of foreign policy change towards Turkey.

In fact, Haydar Aliyev distributed oil deals to American, British, French, Russian, Turkish, and Iranian companies in order to create material interests in those countries

to serve as the basis for pro-Azerbaijani policies (Cheterian 2008: 370). This strategy has not however elicited significant support from these countries, excluding Turkey's sealing of its border with Armenia. Turkey`s support to Azerbaijan in the international sphere regarding the Karabakh issue was implemented at a time when the country was in danger. However, the Turkish reconciliation process with Armenia caused strong protests in Azerbaijan both in the public sphere and among state elites.

The change in Turkey`s approach toward Armenia has depended on the AKP government's foreign policy initiatives for the last several years. Throughout the incumbency of this Party, there has been a constant emphasis on the use of soft power, an improvement of relations with all neighboring countries aptly summarized by the motto "zero problems with neighbors," as well as the vision of a more ambitious role for Turkey as an active regional and global power extending well beyond the realm of favorable bilateral relations (Öniş, 2011: 50). This policy provided the country an important international influence, although disturbances emerged within Azerbaijani state elites. In this respect, the adage "one nation, two states" which was emphasized by Haydar Aliev would become clearly meaningless.

When the son of Haydar, Ilham Aliyev came to power he pursued the similar policies of his father. Despite inheriting his father`s approach with respect to the balance among regional powers (i.e. Russia, Turkey and Iran), son Aliyev`s policies towards Turkey became less clear. Even though some researchers argue that this ambivalence was the result of the Russo-Georgian War in August 2008, further explanations are needed to analyze. Aliyev observed that the Western powers have few incentives to become involved in any struggle in the region, and were unable to protect regional infrastructure projects from the threat of Russian troops during August 2008. In addition, İlham Aliyev felt that his own regime could be under threat by Russia.

Because of the August 2008 events, Azerbaijan seems to be slowly drifting towards Russia by suggesting Turkish negotiations with Armenia on the normalization of relations. This development has been an important cornerstone of foreign policy change of Azerbaijan towards Turkey. However, Turkey declared it will not open its borders with Armenia if the Karabakh problem remains unsolved and one of the main goals of Turkey was to resolve the dispute between Azerbaijan and Armenia (Anatolian News Agency, 26.04.2010); Azerbaijan started to follow Russian-oriented strategies. The most important feature of this policy change resulted from the August 2008 events after the Russian army's military operations in Georgia, which came very close to the Azerbaijani border.

Relations with Azerbaijan, Turkey's long time "fraternal republic" however witnessed difficulties due to the Turkish-Armenian rapprochement in late 2009. Still, bilateral ties remain strong thanks to the readjusted oil and natural gas deals in favor of Azerbaijan recently (Babacan, 2010: 7). Turkey's new policy which has been implemented for the last few years based on the multidirectional doctrine of "zero problem with neighbors" requires the normalization process of its relations with Armenia. That policy made some troubles in the eyes of Azerbaijani state elites, although opposition party leaders (like Isa Gambar of the Musavat Party in Azerbaijan) argued that this policy would enable further development of strategies toward resolving the Karabakh problem.

After the Russo-Georgian War in August 2008, a rise in anti-Western approaches in Azerbaijan's foreign policy was observed following the visit of Turkish President, Abdullah Gul, to Yerevan to observe a national football match and meet Armenian President Serj Sarkisyan in September. Azerbaijan showed its reaction through several steps: When tensions arose between Turkey and Azerbaijan in energy related negotiations, Azerbaijan signed a natural gas agreement with Russia. It also signed the Moskov Declaration on 2 November 2008, against the use of military power in resolving the Karabakh problem. The last step of Azerbaijan was the participation in the Nabucco agreement ceremony in Ankara with only a single minister present (Aslanli, 2010: 143). Azerbaijan`s shuttle diplomacy in gas sales to the EU and Turkey have also been considered untrustworthy by many observers.

One of these activities is the proposed Azerbaijan-Georgia-Romania Interconnect (AGRI) project, which involves the construction of an Azerbaijani gas-processing terminal on Georgia's Black Sea coast and the transportation of gas by ship to Romania for further shipment to Europe's domestic gas pipeline network. On 12 May 2010, an agreement was signed by the Ministers of Azerbaijan, Romania, and Georgia to conduct a feasibility study for the project. According to preliminary data, the project will cost 4.6 billion Euros. If the project is realized, Azerbaijan will gain access to the European market, bypassing Russia and Turkey (Pritchin, 2010: 127). Although this alternative route is less feasible than other options, such as Nabucco and other Southern Corridor pipelines that are partly constructed, Azerbaijan has tried to respond to Turkish and EU supported projects.

In this respect, the agreement on gas sales to Russia from Azerbaijan could be considered as another reaction against Western and Turkish regional strategies. When the opening of the Turkish-Armenian border was on the agenda in Spring 2009 and relations with Azerbaijan became cooler, Russian President Medvedev came to Baku

in July and signed a 500 million cubic meter gas agreement. Though many political observers regarded this deal as "Turkey`s absolute failure", Ilham Aliyev stated with restraint that this deal was the "realization of Azerbaijan`s demand for forming market conditions" (Mahirgizi, 2010). It is clear that Azerbaijanis do not buy the message that progress in the Turkey-Armenia rapprochement will encourage progress in the Karabakh peace process. Analysts across the political spectrum in Baku suggest that Russia has stepped up diplomatic efforts to lure Azerbaijan away from its political, security, and energy links to the West.[2] These links in the end, extend to Turkey and its geopolitical interests towards the Caucasus.

Actually, despite Haydar Aliev`s excessive efforts in balancing regional powers, none of the Russian presidents visited Azerbaijan until Vladimir Putin`s first official trip to Baku in 2001 (Aslanli, 2010: 141). Furthermore, Neither Haydar Aliyev`s warmer approach to Russia nor Ilham Aliyev`s frequent visits to Russia have solved the Karabakh problem. On the other hand, Turkey has consistently demonstrated its willingness to support the Azerbaijani position on the Nagorno Karabakh issue by closing its borders with Armenia since 1993. Thus, it could be argued that Azerbaijan, despite its sultanic rule, has regarded democratic Turkey as a tool for managing its international disputes.

However, Russian-oriented policies in Azerbaijan began in Haydar Aliev`s time, while Ilham Aliev succeeded his father without any foreign policy experience and presented his country`s priorities freely to Russia. Azerbaijan`s main foreign policy dilemma consists of the solution of the Karabakh problem and the use of the country`s hydro-carbon reserves in support of its resolution, whether through negotiation or force. In this case, oil and gas have not been satisfactory instruments for this purpose. On the other hand, Azerbaijan has observed that having energy reserves alone is not enough for any considerable solution of Karabakh problem, but also requires sufficient international support (Alkan, 2010: 160-165).

Conclusions

Azerbaijan has been the closest partner of Turkey in the Caucasus because they share common ethnic, linguistic and cultural features. Turkey has also become the main supporter of Azerbaijan in its transition period toward a market economy and its war against Armenia in the struggle for Nogorno Karabakh that took place from February 1988 to May 1994. Turkish strategic efforts to consolidate Azerbaijan`s

[2] "WikiLeaks: Azerbaijan's Unstable Relationship with Turkey, US, and Russia", http://azerireport.com/index.php?option=com_content&task=view&id=2631&Itemid=53 (23/02/2011).

independence, preservation of its territorial integrity and realization of its economic potential arising from the rich natural resources of the Caspian Sea have accelerated bilateral relations.

Azerbaijan and Turkey have subsequently built upon their linguistic and cultural ties to form a very close economic partnership that sees Turkey negotiating to buy natural gas from Azerbaijan and the two co-operating, along with neighboring Georgia, in such infrastructure projects as the Baku–Tbilisi–Ceyhan pipeline, the South Caucasus Pipeline and the Kars-Tbilisi-Baku railway, all of which bypass Armenia despite a recent thawing in diplomatic relations between Ankara and Yerevan, that make them key players in European energy security.

Azeri soldiers have been training in Turkish NATO-sponsored institutions and military schools for years. Military cooperation agreements have already been signed between the two countries and efforts are moving forward legally. Additionally, Turkish education institutions have been working very actively in Azerbaijan since 1990s. Thousands of Azerbaijani students at both the undergraduate and graduate level have been trained in Turkey and they are very eager for further integration between the two countries.

After Turkish-Armenian reconciliation efforts in 2009, Turkish Azerbaijani relations have entered an extra ordinary period. This period has some consequences as follows:

Turkey and Azerbaijan and their cooperation in the region have depended on mutual interests since the presidency of Haydar Aliyev, beginning in 1993. The most important factor in these relations has been national security problems of Azerbaijan, such as economic weakness, Armenian invasion of the Karabakh region, and oil and gas pipelines bypassing Russia or Iran.

Turkey`s formal alliance relationship with Western Europe and the US have accelerated Azerbaijan`s interest toward Turkey since its independence. On the other hand, the Russo-Georgian War in 2008 showed that Azerbaijan should revise its balanced policy between regional and global powers. Among these powers, Russia became the most important partner for Azerbaijan. Despite Russian support to Armenia during the Karabakh War and Russian military bases located in Armenia for decades, Azerbaijan has preferred to remain close to Russia.

This policy could be explained by the insecure policies of Ilham Aliyev, who has still reaction the regime changes in its neighboring country, Georgia. Aliyevs` Azerbaijan

is now more of an autocratic regime that has ignored the importance of Western-style democratic developments in its country because of its possible personal effects. On the other hand, Turkey`s position and its increasing influence in the region have disturbed son Aliyev for many years. Even if Aliyev has achieved no lucrative results in regaining the territories occupied by Armenian troops for 18 years, that result would not be important for his regime. Furthermore, the regime which was established by the Aliyevs would depend increasingly on Russian support that suffered considerably from the "colored revolutions" in Georgia, Ukraine and Kyrgyzstan from 2003-2005.

Finally, it could be argued that Aliyev`s ambivalent attitudes towards the West, particularly the US and Turkey, will increase after the popular revolutions in the Arab countries in recent years. Many observers claim that the Aliyev regime has already ignored these developments throughout the world. Turkey and Azerbaijan would eventually become closest partners, if Azerbaijan struggles with the political paradox of contemporary Azerbaijan. On the other hand, the turbulence existed during crises over Protocols taught both countries should have developed their ties based on more optimal, rational, and institutional levels.

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THE FOURTH INDUSTRIAL REVOLUTION AND LABOUR: A MARXIAN THEORY OF DIGITAL PRODUCTION

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Abstract

In recent years the birth of 'digital production' has spurred a lively theoretical debate in political economy, seeking to understand the implications of 'immaterial labour' for the labour theory of value. These discussions have identified a number of theoretical challenges pertaining to the conceptualization of capitalist production in digital space. In particular, scholars have been puzzled by the question of how the notion of 'abstract labour-time' applies to immaterial labour, how the 'free use' of websites/applications is compatible with 'commodity production', what role 'users' play in the production process, and whether digital firms can be simply seen as rent-seekers disengaged from value-production altogether. In this paper I present an answer to these questions using Marx's Circuits of Capital model which allows a clear understanding of 'commodity production' and 'labour-processes' to be drawn in any microeconomic arrangement. I then complement this theoretical analysis with case examinations of the actual revenue processes of two major firms: *Facebook* and *Google.* Using this model, I demonstrate how digital production in these firms can be theoretically modelled as *capitalist* production, and how the monopoly profits of these mega corporations can be seen as 'unpaid labour' extractions from spatially segregated people all across the globe. Thus, in contrast to celebratory accounts that posit digital profits as 'returns to innovation', the analysis presented here reveals how surplus-value 'exploitation' and the 'law of uneven development' plays itself out in the whole process, allowing the immense benefits of advancements in digital technology--- like other technological advances under capitalism--- to remain confined within a tiny elite that is *physically* located in a few advanced capitalist economies. The paper concludes that the latent possibilities of what has been termed the "Fourth Industrial Revolution", despite its socializing and democratizing *potential* to connect millions of workers to consumers *directly*---without the aid of capitalist intermediaries--- remain untapped as long as capitalist relations of production predominate the *physical*, and consequently the *virtual* economic and political milieu.

Key words: Digital Economy, Technology and Capitalism, Facebook Business Model

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Introduction

In 2016, the World Economic Forum summit startled its audience with a bold proclamation: digital production has ushered mankind into a "Fourth Industrial Revolution", where "the speed of current breakthroughs has no historical precedent", and developments are "evolving at an exponential rather than a linear pace".[1] Regardless of the merits of such a historic proclamation there is, nevertheless, little doubt that the meteoric ascent of the digital economy is remarkable by any metric of success. Consider for instance the fact that in little over a decade, *Facebook* and *Google* have emerged on the coveted Fortune-500 list of the world's wealthiest corporations. In addition to their financial success, these companies also exert an enormous amount of *social* influence simply by virtue of the sheer magnitude of the percentage of the global population that they are able to engage with on a daily basis. With global access to the internet ever on the rise, especially in Third-world countries where large reservoirs of populations without internet-access remain an 'untapped market' (Fig. 2) for digital production, one can be certain that digital corporations will exert an ever greater economic and social influence in the future economy. Estimates already suggest that the global digital economy represents a staggering $4 trillion industry, accounting for over 5% of the GDP in rich countries (Fig.1).

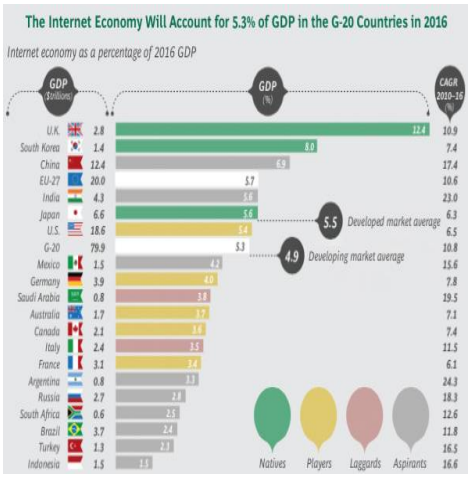

Fig 1: Size of the Digital Economy in Major Countries

Source: Boston Consultancy Group Report, 2016

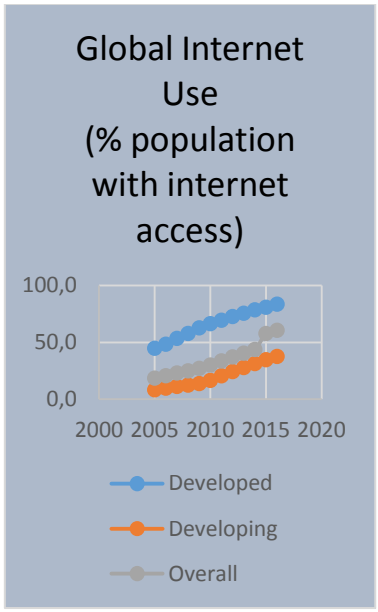

Fig 2-A Growing Market: % Population with Internet-Access

Source: International Telecommunications Union

[1] For details, see https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

The spectacular rise of the digital economy has given birth to an array of intriguing theoretical discussions, that seek to assess the economic implications of these new forms of production. Scholars have approached the question from different entry-points, and as a result, have arrived at very different conclusions on how, and to what extent, digital innovation will transform human lives. In a host of studies, scholars such as Khumalo (2010), Basu (2010), Hersovici (2011), Chen, Tsai, and Hsu (2014), Yadav (2016) present theoretical and empirical analyses of the implications that digital technologies have had on factors such as 'knowledge', 'productivity', 'e-governance', and 'consumer satisfaction'. Neoclassical economic theory, which concerns itself primarily with questions of 'efficiency', 'growth', and 'profitability', rather than questions of 'distribution' and 'inequality', celebrates the success of digital corporations such as *Facebook* and *Google* as returns to their 'innovative genius'; for these groups of theories, the ascent provides yet another 'confirmation' of the immense 'entrepreneurial potential' of capitalism (Basu, 2009). Thus, the general consensus in most mainstream discussions is that the impact of the digital revolution is, on the whole, a positive one. What has received far less attention in these predominantly laudatory discussions, therefore, is the impact that digital production will have on *labour*, by transforming its fundamental questions: the 'why', 'what', 'where', when', and 'how' of *work* itself. Yet, it is answers to these central questions that will determine how the "Fourth Industrial Revolution" impacts *human* lives---as *workers*--- under these new forms of capitalist production.

This paper seeks to address that gap in the literature by developing a political economy theoretical framework, combined with case examinations of two major digital corporations (*Facebook and Google),* that allows us to focus on questions pertaining to digital labour. While there are multiple analytical frameworks within the broad political economy tradition, the Marxian framework provides the clearest understanding of the relationship between technological change and the matrix of social relations within which humans produce and consume goods and services. In particular, the conceptual apparatus of Marx's magnum opus, the three volumes of *Capital*, provide a general theoretical framework to examine social relations in capitalist production. This analytical framework starts from a very different premise than mainstream economic theory, specifically the concrete fact that all production---regardless of its *historical*[2] form--- requires *labour*: an exercise of human nerves and muscles to produce a useful product. While Neoclassical theory also *discusses* labour, it treats it as being no different than other "factors of production". In contrast, Marxian theory does not fixate on the mechanics of a production process, its 'efficiency' or 'profitability' per se; rather, the aim of the theory is to assess the impact that any change---and technological change is no exception--- exerts on the *social relations* of production: the

[2] For Marx, 'capitalism', just like 'feudalism' or 'slavery' are *historical* rather than *eternal* forms of producing goods and services.

organization of work. This leads the theory to distinguish, first and foremost, between the *direct-producers* (those performing labour) and the *appropriators* (those making decisions about those products) in any process of production, and then exploring the social relationships *between* these two groups of economic agents. This leads the two competing economic theories to ask a very different set of questions. While mainstream economic theory begins by analysing any technological innovation with the question 'is it profitable?', or 'does it maximize efficiency?', Marxian theory begins with a different set of questions: who produces the surplus? Who makes decisions about the distribution of this surplus? To whom are these distributions made, and why? As we will see, once these questions are asked in the context of digital production, one immediately understands the monopoly profits of mega digital corporations such as *Facebook* and *Google* (which are heavily concentrated physically in rich countries) to be, in fact, a result of what Marx termed 'unpaid labour' extractions from millions of people spread out all across the globe, rather than returns to superior intelligence and/or innovation.

In Section 2, I present an overview of some of the questions and challenges that scholars within the Marxian tradition of political economy, such as Hardt and Negri (2004, 2009), Virno (2004), Fuchs (2014, 2016), Pasquinelli (2009), Nixon (2014), and Fraysse' (2016) have pointed out in their recent studies on digital production. These discussions have given birth to a number of intriguing questions: 1) how does one understand 'website'/'cellular applications' to be *commodities* as in Marx's *Capital*, especially given the fact that in most cases a price is not charged for viewing them? 2) How does a change in the patterns of 'labour-time' under digital labour alter the premises of 'abstract labour' in Marx's value theory? 3) What role do audiences (users of websites/applications) play in the entire economic process? 4) From a value-theory standpoint, does 'production' take place in digital corporations at all, or is the labour performed more akin to 'rent-seeking', unproductive labour? The discussion in Section 2 achieves the twin goal of presenting a brief, critical overview of the recent debate on digital production, as well as identifying the importance of these four central questions to that debate.

In Section 3 of this paper I present a theoretical framework of digital production, premised on Marx's Circuits of Capital model, to present an answer to these analytical questions. I start off, although it may seem trivial, by presenting a clear definition of what exactly Marxian theory means by *capitalism* as our 'object of inquiry', so we can apply it to our concrete case of digital production. While I am aware that this is by no means a universally agreed upon concept even within the Marxian tradition, I follow the interpretation of a number of influential Marxian economists including Resnick and Wolff (1989), Shaikh (2016), and Gibson-Graham (2002) to understand any 'mode of production' as a distinct way of organizing---producing, appropriating, and distributing--- the economic surplus.

Capitalism, seen from this light, is any act of production that simultaneously involves two economic processes: a) the buying and selling of labour-power in the labour-process, b) commodity-production, that is the idea that the *product* of the labour-process is *sold* on the market as its aim is not its immediate consumption, or use-value, but rather the exchange-value that will be derived from its sale (See Harvey, 2015 or Fine & Filho 2016).

Next, I will proceed to show how *both* conditions are satisfied in various cases of digital production, including *Facebook* and *Google*. As we will see, website/application-development not only involves *production* and *labour*, this production takes place on a *capitalist* basis: it involves both the buying and selling of labour-power, as well as the selling of the products *as commodities.* A major source of confusion for existing theories, and their struggle with digital production, stems from their inability to grasp the 'commodity' that these companies produce. The confusion is understandable, as it seems at least superficially, that users are not charged a price for viewing a website or downloading a cellular 'application'; hence the entire notion of 'commodity-production' seems murky at first sight. However, based on Marx's discussion in *Capital Volume II,* I argue that the 'commodity' can *only* be understood from the perspective of the person *paying for its exchange-value.* Once this criterion is properly introduced into the discussion, it becomes immediately clear what digital corporations like *Facebook* sell as *their* specific commodity: 'promotion services'. Existing accounts fail to distinguish this *commodity* (promotion services), which results in their inability to identify the *customer* (the person paying for promotion services), which in turn results in an ability to identify the direct *producers, the productive labour,* since the commodity that is being produced was not identified in the first place.

Having identified both the commodification of labour-power and the product of labour in different digital enterprises, I make the 'profits' of these enterprises the object of analysis in the final part of the paper. An analysis of their revenue process reveals how *Facebook* and *Google* actually make their profits. This involves a two-stage process. In step one, a 'network' of internet users is created that results in the generation of 'traffic' on that website. In step two, the corporation finds a way of *monetizing* that traffic, by selling promotion services *as a commodity* to *others* (those seeking promotion) in the network. I demonstrate that the profits made by digital enterprises consist of two main channels: 1) Surplus-value appropriated from the labour of people *directly* hired by these companies (their employees), for example as code-writers, network-designers, and software engineers, whose labour results in the production of the promotion services that *Facebook* sells; and 2) Surplus-value *indirectly* received by these enterprises, as distributions made by other labourers (for example independent film makers uploading their content) who are not directly *employed* by the firm. This consists of individuals and small companies who produce and upload online

content (such as movies and songs) independently, which means that they bear the labour non-labour costs involved in production themselves, and although they are not directly employed by *Facebook* they nevertheless have to make *distributions* out of the revenues generated from their own labour, as a *condition* of uploading their content on *Facebook's* platform. In either case, the revenues made from 'promotion services'---as a commodity--- are a result of the *labour* of individuals engaged in enabling the production of that network.

Thus, the paper concludes that the massive rates of accumulation of digital corporations in the last decade, once understood via the conceptual arsenal of 'unpaid-labour' developed in Marx's *Capital,* provide yet another confirmation of how surplus-value exploitation under capitalism allows the immense benefits of advancements in digital technology--- like all previous technological advances under capitalist relations of production--- to remain confined within a narrow elite, which is itself physically located in a few advanced capitalist economies. As such, the immense potential of the Fourth Industrial Revolution---like its predecessor---will remain untapped as long as capitalist relations of production predominate the *physical*, and as a result, the virtual world.

1. Political Economy of Digital Production: Challenges and Unanswered Questions

In this section I present a brief critical overview of some of the recent discussions that have taken place on the political economy of digital labour and production. The aim of this overview is to present an appreciation for the set of questions that have emerged in recent debates with regards to Smith, Ricardo and Marx's labour theory of value. I will divide the theoretical discussions in this overview into two broad categories: a group of theories that follows the work of Hardt and Negri (2006) to assert that "immaterial" labour represents the demise of value theory altogether, and a second group of theories that responds to these sceptical claims, by showing how the conceptual apparatus of value theory is in fact applicable---albeit certain nuances---to digital production. The latter group of theories are themselves split into two sets of alternative explanations: 1) The rent-based approaches, that argue that *Facebook* and similar companies do not produce anything; rather, these theorists argue, they charge a rental fee for 'use of space'; 2) The 'audience-labour' approaches, that accept that production takes place in these companies, and argue that the 'audiences' of websites and applications----*Facebook* and *Google* users---perform unpaid labour without ever realizing. I examine each of these theories below, present their main arguments, and summarize the questions that have emerged from their investigations. This will pave the way in the next section for an alternative theoretical framework that addresses these questions using a Marxian Circuits of Capital framework.

1.1. Digital Labour and Disjuncture in Abstract-Labour Time

In a series of articles and books, Negri (1991) and Hardt and Negri (1994, 2000, 2004, 2009), followed by Virno (2004) and others have argued that digital production marks such a profound transition from 19th century classical capitalism that the labour theory of value no longer provides an adequate explanation of values and prices under capitalism. The theoretical framework developed by the classical political economists---Smith, Ricardo, and Marx--- their "law of value", we are told, "is shattered and refuted by capitalist development itself" (Virno, 2004; p. 100).

The crux of this claim stems from the idea that 'immaterial' forms of labor and production alter the concept of 'abstract labor-time', a concept central to Marx's entire discussion of value in *Capital.* Let us therefore concentrate on this particular aspect of the problem first, making an attempt to understand the chain of analysis in Hardt and Negri's famous study, *Multitudes*, where this claim is systematically presented as follows:

"Once we articulate Marx's concept of abstract labor and its relation to value, we quickly recognize an important difference between Marx's time and ours. Marx poses the relation between labor and value in terms of corresponding quantities: a certain quantity of time of abstract labor equals a quantity of value. According to this law of value, which defines capitalist production, value is expressed in *measurable*, homogeneous units of labor time. Marx eventually links this notion to his analyses of the working day and surplus value. This law, however, cannot be maintained today in the form that Smith, Ricardo, and Marx himself conceived it. The *temporal unity of labor* as the *basic measure of value* today makes no sense" (Hardt and Negri, 2004; *p. 259, emphasis not in original)*

Thus, Hardt and Negri's claim that the concept of abstract-labour time' is inapplicable to digital production, and hence their conclusion that the law of value is untenable today has to do with, in their own words, a disjuncture in what they term "the temporary unity of labor". Given the new immaterial forms of labour, Hardt and Negri claim 'temporal unity' as a measure of value "makes no sense" anymore. Since Hardt and Negri's conclusion rests pivotally on the concept one may legitimately ask: what exactly do they mean by the 'temporary unity of labour'? One needs to dig the argument a little deeper to see Hardt and Negri explain what they mean by this elusive concept:

"The working day and the time of production have changed profoundly under the hegemony of immaterial labor. The regular rhythms of factory

production and its clear *divisions* of *work time and non-work time* tend to decline in the realm of immaterial labor." (Ibid, 260, emphasis not in original)

As an example of the "profound" transformation hinted at in the above statement, Hardt and Negri point out that "companies like Microsoft try to make the office more like home, offering free meals and exercise programs to keep employees in the office…" while "at the low end of the labor market workers have to juggle several jobs to make ends meet" (Ibid). In other words, the mysterious concept of 'temporal unity of labor' is actually quite a simple reference to the distinction between 'work time' and 'non work' time, or 'work' and 'leisure' as it is typically understood in most economics discussions, or what is simply called the 'work-life balance' in colloquial use. For Hardt and Negri, digital production cannot be explained through Marx's theory of value because the distinction between 'work' and 'leisure' has become blurry. "Labour and value", they argue, "have become bio-political in the sense that living and producing tend to be indistinguishable" as there is an overlap between work and non-work time (Hardt and Negri, 2006; p. 249). Since this "biopolitical production is immeasurable" that is, it "cannot be quantified in fixed units of time", Marx's concept of abstract labor time is no longer applicable.

The connection that Hardt and Negri have drawn between 'value theory' and 'work-leisure' balance is as unique---for no one in classical or neoclassical political economy has made such a claim---as it is incorrect. For Marx, the notion of abstract-labor has *nothing* to do with work-life balance as Hardt and Negri have incorrectly claimed. Rather, the concept (which, like any concept, is useful only if it distinguishes itself from something else) stems from an understanding of what Marx and Marxian economists since have called "the dual character of labor": the opposition between 'individual' and 'abstract' labor time.

Individual labor-time, as Marx writes in the *Grundrisse* "exists as such only subjectively, only in the form of activity". He reminds us that "in so far as it is exchangeable as such, it is defined and differentiated not only quantitatively but also qualitatively, and is by no means general, self-equivalent labor time; rather, (individual) labor time as subject corresponds as little to the general labor time which determines exchange values as the particular commodities and products correspond to it as object" (Marx, 1973; p. 171)

'Abstract labor-time', in contrast, is 'indeed the labor-time of an individual, but of an individual in no way different from the next individual' (Marx, 1970; p. 32). In the value form "all labor is expressed as *indistinct* human labor, and consequently as labor of equal quality" (Ibid). As Tombazos (2014) rightly points out in his brilliant study on the '*categories of time in Marx'*, it is "only by having recourse to this (real) abstraction" that one can "speak of indifference as regards the individuality of the content and form of labor, for labor's quantitative dimension

does not erase its qualitative traits" (Tombazos, 2014; p. 19). It is in this precise sense that Marx argued that "labor, thus measured by time, does not seem, indeed, to be the labor of different persons, but on the contrary the different working individuals seem to be mere organs of this (abstract) labor. (Marx, 1970; p. 30)"

Of course, in any concrete activity of labor "the worker does not work twice, once 'individually' and then 'abstractly' (Tombazos, 2014, p. 19). But it is precisely in this dialectical opposition, between 'individual' and 'abstract' labor-time---in the "same that is opposed to itself", that is "one and the other" simultaneously --- that the secret of value lies. It is this discovery of Marx, his great contribution to political economy, that provides an answer to the *paradox* of value: why commodities with *qualitatively* different use-values can express *quantitatively* similar exchange-values. Marx's answer rests on the fact of commodity production, where products of different kinds of concrete labour (shoe-maker, brain surgeon, violinist etc.), representing different kinds of use-values interact with one another in the market, where they become 'equalized' as exchange-values: they are *only* representatives of 'homogenous labor'. The notion of abstract labour is contingent on the fact of *commodity production and exchange*, and not the balance of work and leisure in workman's lives, as Hardt and Negri have incorrectly assumed.

It obviously follows from this, that Hardt and Negri's claim about 'measurability' of 'abstract labour' in Marx's theory of value is also flawed since it is based on a false premise to begin with. Abstract-labor is not, as Hardt and Negri also incorrectly assume, a simple mapping of physical labor-times onto values. Rather, as I have already pointed out, the conversion of individual labor-times into abstract-time happens through the process of exchange and circulation--- the market mechanism--- where the products of different individual labors interact with one another and *become* homogenized, abstract labour. The mechanics of this process, that is to ask *how* abstract-labour hours are transformed in the market to dollar prices, is the object of a lively theoretical discussion in Marxian economics--- known as the 'transformation problem'--- and a detailed discussion of these debates is beyond the scope of the present paper (See Foley, 2014; Basu, 2009; Shaikh, 2016; Sweezy, 1946).

1.2. Digital Production or Digital Landlordism?

A second line of inquiry seeks to develop an understanding of the digital economy by drawing parallels with Marx's discussion of 'ground-rent' under capitalism. While there are at least three different versions of what I term the 'digital landlords' or 'rent-based' approaches, there is consensus in these lines of inquiry on two fundamental points: 1) that what is taking place in digital corporations, from a purely economic standpoint, is *not productive activity*, in the sense that no new values are produced in the economic transactions, and 2) that the labour

performed in reproducing these activities is thereby 'rent-seeking', and/or 'unproductive' labour. These two conclusions are arrived at from three different points of entry:

In one line of reasoning, owners of digital companies are seen as renting-out "the use of the medium to the industrial capitalist who is interested in gaining access to an audience" (Caraway 2011, p. 701). A seller of shoes, for example, who wants to advertise his new product in a market pays *Facebook* for a price on its 'wall'. This 'wall' is rented out by Facebook to this shoe seller. In this theoretical framework, the *latter* (the shoe making industrial capitalist) is the *productive* capitalist whereas *Facebook* is an unproductive, digital landlord. This notion of rent is closer to that of renting-out an asset (e.g. a piece of land) rather than Smith, Ricardo, and Marx's notion of *differential* ground rent, which emerges from the differential levels of productivities of different pieces of land (Marx, 1973)

Fraysse' (2016) presents an alternative rent-based explanation. He argues that companies such as *Facebook* or *Google* perform unproductive activities, as they can be compared to "an advertising agency of some type" (Fraysse', 2016: p. 173) since their activities, for Fraysse', are akin to billboard advertising. In both cases media owners "monopolize screen space" that enables them to levy a ground-rent on the "one (who) pays for a space in which to advertise for a given period of time" (Fraysse, 2016; p. 182).

A third rent-based theory looks at one firm (Google) and posits its revenues as 'cognitive rent' emerging from the "power to demand free labor" via the control over the 'common intellect' (Pasquinnelli, 2009). The internet for Pasquinnelli represents a 'common' brain that performs collective labour in its capacity as internet-users. Google (and by extension other similar enterprises), for Pasquinnelli, are able to extract rents from this common brain purely by virtue of their ownership of the platform. This line of reasoning is, in fact, closer to the 'audience-labour' group of theories discussed below. But before moving on to discuss these alternative sets of approaches, it is important to point out some of the general problems associated with a purely rent-based understanding of the digital economy.

First, it is crucial to remember that for Marx 'rent, 'interest', and 'profit' represented *distributions* out of surplus-value and dismissing something as 'rent' does not absolve the theorist of the responsibility to explain the *source* of that surplus-value itself, since something has to be produced before it can be distributed. Rent-based approaches are almost always based on some kind of a metaphoric use of the term. In one sense, it is used for 'rent-seeking activities' (which have nothing to do with rental relations between a landlord and a tenant for example), while in another it used as a fee similar to the one charged by advertising firms.

Second, a purely rent-based approach does not provide an adequate explanation of the digital economy as it fails to see that unlike rented out assets (e.g. a piece of land, or an apartment), which do not require constant production and reproduction, companies such as *Facebook* and *Google* have to actively engage in the production of their websites and applications.

Finally, and this is more so applicable to rent-based approaches that rely on the concept of 'unproductive labour' to explain digital labour processes, the conceptual distinction between 'productive' and 'unproductive' labour in Marxian economics has absolutely *nothing* to do with the concrete nature of a productive act but rather is determined by looking at the social relationship of production. This simply means that it is impossible to declare any kind of labour or production, a priori, to be *unproductive* just by looking at the mechanics of the process. For example, if we were only given the information that person X performs 'advertising services', 'security services', or 'legal services', we cannot deduce whether this labour activity is productive or unproductive with just this information. As Marx (1975) so clearly explains, the same labourer (he gives the example of a joker, performing labour as a self-employed independent worker versus in a circus operated by a capitalist) performing labour in different circumstances---whether under the employment of a capitalist or not---will be productive or unproductive, depending on the *social* relationship of production. Similarly, even if we accept the argument that digital labourers engage in advertising labour, we cannot deduce whether this work is 'productive' or not. In *Capital Vol.II*, for example, Marx gives the example of transport workers. He says that "what the transport industry sells is the actual change of place itself. The *useful effect* produced is inseparably connected with the transport process…" (Marx, 1978; p.135). In other words, services are *commodity-producing* activities if they are performed under the employment of a capitalist. As we will see in the next section, to deduce and distinguish productive from unproductive labour, one has to distinguish between the 'labour process' (whether or not the direct-producer was employed by the capitalist), and the commodity-process (whether or not the product of labour was sold in the market).

1.3. The Role of the Audience (Users) in Digital Production

A third stream of the literature approaches the question from a completely different lens, that of the 'audience': the users of websites and applications. This group of theories draw their inspiration from the work of Dallas Smythe, who had sought to understand the political economy of the forms of mass communication (television, films etc.) in the 1970's and early 80's. Smythe (1977, 1977b, 1981), in a series of articles that sought to shift the focus of discussions on mass media from merely providing cultural conditions of existence to capital, to the production of surplus-value in this industry itself, came up with the idea that "the

material aspect of communications is that *audiences* work, are exploited and *are sold as commodity* to advertisers" (Fuchs 2014, 77, emphasis not in original).

Smythe's idea has seen a resurgence in recent years with the work of Fuchs (2014, 2016), Nixon (2015), and Fisher (2015), who use it to argue against Hardt and Negri's claim about the invalidity of Marx's labor theory of value. Fuchs (2014) builds on Smythe's theory to develop an understanding of what he claims is an "expression of new qualities of the labor theory of value" (Fuchs, 2014, 27), in which users of *Facebook* perform labor without even realizing it themselves. For Fuchs, the act of visiting these cyber spaces, sharing information and photographs, constitute a *labor process* that results in the production of "attention", a commodity whose value is determined by the "average number of minutes that a specific user group spends on *Facebook* per unit of time divided by the average number of targeted ads that is presented to them during this time period" (Ibid). In other words, the time spent by the user 'browsing' on *Facebook* counts for Fuchs as productive labor time as he/she is in the process of producing 'attention', which will then be sold to advertisement companies for a profit.

In other words, for Fuchs and other audience-labour theorists the *commodity* that is being produced is 'attention'. As critics point out, the problem with this view is that it conflates 'production' and 'consumption'. The provider of 'attention'---the 'users'--- *consume* the content that is uploaded on their pages. They do not engage in the *production* of these pages. 'Audience' labour theorists retort by pointing out that if users are consumers then why do they never have to make any payments to *Facebook* or *Google* to view/consume the content? As we will see, this is an important question that merits an answer. I will provide an answer to this question in the next section by pointing out that there is a distinction in digital capitalist corporations between the *user* and the *customer*. The *latter,* seeking promotion services, *pays* for the service to get the attention of the *former*. The former gets 'free use' of the platform, but the flipside of his/her 'free consumption' is the 'forced consumption' of unsolicited content/ads.

But for audience-labour theorists, the only way out of the problem of 'free consumption of users' is that the 'users' perform labor, without whom, "*Facebook* cannot make money" if they "do not constantly use the platform and thereby produce data and attention" (Ibid). But one may ask: is this not true for *all* consumers? Capitalists--- physical or digital--- cannot survive without *consumers,* since surplus-values cannot be realized without consumption, but their importance to the reproduction of a capitalist activity does not undermine the fact that goods and services are *produced* before they can be consumed. Audience-labour theory blurs the distinction between 'users' and 'customers', and thereby blurs the distinction between the 'direct producers' of commodities and the 'consumers' of commodities.

To reiterate then, the recent debate on the political economy of digital production revolves around four central questions: 1) how does one understand 'website'/'cellular applications' to be *commodities* as in Marx's *Capital*, especially given the fact that in most cases a price is not charged for viewing them? 2) How does a change in the patterns of 'labour-time' under digital labour alter the premises of 'abstract labour' in Marx's value theory? 3) What role do audiences (users of websites/applications) play in the entire economic process? 4) From a value-theory standpoint, does 'production' take place in digital corporations at all, or is the labour performed more akin to 'rent-seeking', unproductive labour?

2. A Marxian Model of Capitalist Production in Digital Space: *Facebook and Google*

2.1. Network Traffic Monetization: The Revenue Model of Facebook and Google

In order to answer the aforementioned questions, in this section I will present a theoretical framework that allows us to situate the production processes of digital enterprises in the context of capitalist production. But before we can assess whether the activities of digital companies--- *Facebook* or *Google*--- can be described as capitalist forms of production, we must first understand how these corporations actually make money; that is, we must develop an understanding of their 'revenue-processes'.

The two major digital corporations, who are monopolistic competitors in the sense that although they produce the same commodity (promotion services, as discussed earlier), they have different specializations within this industry: *Google* specializes in delivering 'search-based' promotion services to its clients, while *Facebook* provides 'information-generated' promotion services. Both corporations are members of the elite group of *Fortune-500* companies. *Facebook*, with its $27,000 million revenues stands at 157th, while *Google's* parent company *Alphabet* (which entered the market earlier than *Facebook)*, stands at number 36 on the list with its $89 billion revenues. Given the fact that both these corporations have managed to achieve this in a relatively short time period, the profit *rates* of these firms are spectacular, even by historical standards. Between the decade 2006 to 2016, for example, *Google* saw an approximately 750% increase in its revenues (Fig-3) The accumulation spurt of *Facebook* is even more startling: since 2007, the corporation has increased its revenues by a mammoth 18,000 percentage points (Fig-4).

What is the revenue process that has resulted in these massive rates of expansion? This revenue process can best be summarized as a two-stage process. In step one,

the digital corporation generates a 'network of users' that creates "traffic" on its website. In this step, the corporation seeks to extract as much personalized information as possible from the 'user' during what seems like a 'free interaction' in the sense that the user is not charged a price in this interaction. The 'desirable result', from the perspective of the digital corporation, is that the set of 'free' services offered by the website---'search engine' in the case of *Google* and 'social interaction' in the case of *Facebook*---result in the generation of 'traffic' on the website. Once a significant threshold level of traffic is generated then, in step two, the corporation finds a way of monetizing the traffic that it has generated by allowing *others* to promote their message to specific *groups* of users. Thus, as more varied and diverse groups of users get connected to the network produced by the corporation, it attracts an equally diverse range of 'customers' from all across the globe. How each firm generates 'traffic' on its website varies from company to company but the general revenue model is the same: traffic generation, followed by monetization of that traffic.

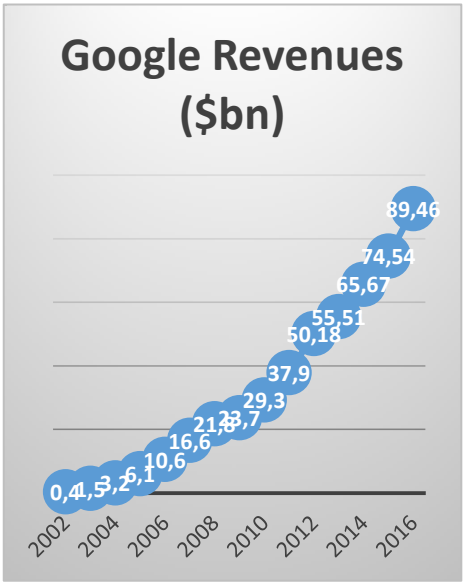

Fig-3 Google Revenues 2002-2016 ($bn)

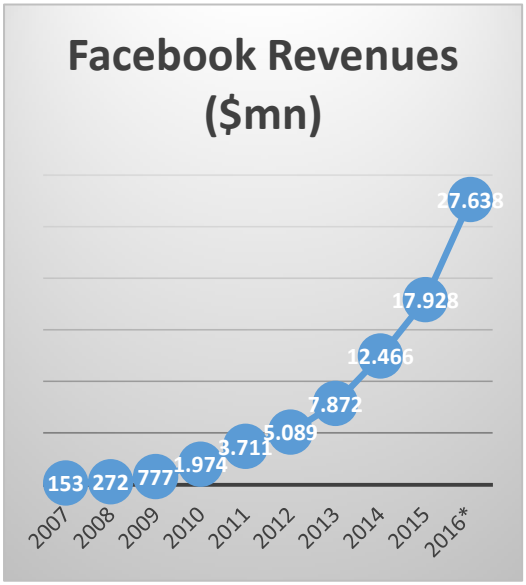

Fig-4-Facebook Revenues 2007-2016 ($mn)

2.2. Circuit of Capital Model and Digital Production

Let us now turn to the theoretical question at stake: how can this two-stage revenue process described above be understood as occurring on a *capitalist* basis? Of course, to answer this question we must first answer the following question: what exactly do we mean by capitalism? I am aware that this is itself a question of intense debate within the Marxian tradition. Resnick and Wolff (1989) and Gibson-Graham et al (2002) provide a detailed overview of the competing theories in Marxian theory.

In particular, the 'property', 'power', and 'surplus' based approaches are used by different scholars to examine and distinguish capitalism from non-capitalism in any concrete situation. The key to understanding this problem is that the particular approach to defining capitalism that one employs also defines, by extension, how one understands non-capitalism. For example, the property theory, which has been the privileged theory for orthodox approaches to Marxism, views capitalism as a system of 'private ownership of the means of production'. It thereby regards an economic arrangement with non-private ownership as non-capitalism. In contrast, as Resnick and Wolff (1989) and Gibson-Graham (2002) have shown, a surplus-based approach, that understands how in a given situation "surplus is pumped out of direct-producers" (Marx, 1973; p.155), provides the clearest exposition of Marx's unique understanding of modes of productions.

Following their insights, and Marx's discussion in *Capital*, I will rely on Marx's Circuit of Capital model to understand capitalist production, as it provides a simple and summarized understanding of capital, as value-in-motion:

$$M < \begin{Bmatrix} LP \\ MP \end{Bmatrix} - P \ldots . C' - M'$$

where *M* is initial money-capital, which goes into the sphere of circulation and is exchanged for two kinds of commodities: labor-power (*LP)* and means of production (*MP).* It then leaves the sphere of circulation and enters the realm of production (and exists as productive-capital *P),* where the capitalist must 'productively consume' the two commodities that have been purchased from the market. The productive consumption of these two commodities yields a new commodity, *C',* which is pregnant with surplus-value. This new commodity then returns to the sphere of circulation and realizes itself as *M',* "capital in its familiar form" (Marx, 1867; p. 186). Capital, for Marx, is self-valorizing value; or value that is in the process of increasing itself from *M* to *M'.* The productive workers, who produce 'new value' equal to *M'-M* are paid a value of *LP< (M'-M).* In other words, surplus or unpaid value is extracted from workers under capitalist production.

Thus, to talk about capitalist production---as a 'social relation'--- in any concrete form of economic activity, we must look for two kinds of social *interactions*: 1) *M-LP*, the buying and selling of labour-power, where a worker sells his/her labour-power to the owner of capital *M;* and 2) *C'-M',* the selling of the produced commodity to a customer willing to part with his/her money (*M'),* in exchange for the commodity produced through the labour of the wage-workers. Minus any one of these two conditions, an economic process *cannot* be understood as being a capitalist economic process from the lens of the Circuit of Capital. For example, if someone hires a personal driver on a monthly wage, the driver *is not* engaging in capitalist relations since the product of his/her labour (driving services) are *not*

being produced for sale *(C'-M')*. Conversely, a person performing driving services *independently* (for example as a person who drives his own taxi) is *selling* a commodity but is *not* engaged in capitalist activity since he/she is not *hired* by anyone and the exchange *M-LP* does not take place.

Given this simple model, one can examine any concrete case of production and ask the following questions: 1) Who furnishes the initial *M* and in what proportion does he/she allocate that *M* to purchase labour-power and means of production, respectively? 2) Who are the productive workers (who provide *LP)* engaged in the production of the commodity, *C'*? 3) What is the commodity *C'* that is being sold in any concrete case? 4) Who is the buyer, the owner of *M',* who is willing and able to exchange his money for this commodity? These are the questions that directly emerge from a model of capitalism premised on the circuit of capital model and they can be asked in the process of investigating any form of concrete production.

Let us now go back to our concrete case--- *Facebook* and *Google*--- using this circuit of capital model. We begin with the concluding branch of this circuit, *C'-M'* and ask: what is the commodity in the business model? From their financial reports, one learns that *Google* derives over 75% of its $89 billion revenues from a feature known as 'AdWords'. All keyword searches made by users on their website are run via an algorithm to sort relevant information from all over the web, and deliver the most relevant results to the user. The use of this algorithm is free for all 'users', which generates an enormous amount of traffic on the website. This is step one of the revenue process described earlier. It *does not generate* revenues for the firm but merely generates the 'traffic' that will be monetized in step two. *Google* processes 40,000 searches per second or roughly 3.5 billion searches in a single day[3] but none of these searches, in of themselves, are commodities. Rather, the revenue generating process involves the intervention of a *customer* willing to pay for promotion services in that traffic-generating network. This consists in converting those keyword searches into a monetizable activity. The way *Google* achieves this goal is by converting every keyword search to tailor the display of its advertisements for each specific user. These advertisements may or may not be from other 'industrial capitalists' seeking to sell their items. For example, if an individual consistently searches for 'charities to donate to', one will soon be flooded with all kinds of local and international charities prompting you to make contributions to their respective causes. The main point is not *who* the buyer is, whether another capitalist or a charity organization, but rather that there are people who are willing and able to buy the commodity and extract its use-value: promotion on 'walls'. Since there is demand for this labor, the production of these services---digital 'promotion'---on a

[3] www.internetlivestats.com

capitalist basis constitutes a new and independent branch of the social division of labor" (Marx, 1867, p. 87).

Similarly, *Facebook* derives over 90% of its own revenues from advertisements placed on, what are termed a user's "wall". *Facebook's* algorithm is built to collect personalized information about an individual---political views, sports interests, cultural interests, interests of friends etc.--- captured through what that user 'likes'/'dislikes': step one of the revenue process, which is non-revenue generating activity. In step two, *Facebook* gives its clients the opportunity to tailor a promotion message to specific 'types' of users.

Thus, in either case, it becomes immediately clear that it is this 'client' who is engaging with the company in the concluding monetary transaction, *C'-M',* the person/company willing and able to buy the commodity: online 'promotion services'.

Once we have settled the question of the commodity being sold by *Facebook* and *Google*---digital promotion services--- we can now inquire about the *production* of this commodity. A number of labour processes must be performed in order for 'promotion services' to be sold by the two companies. A host of software experts must write and run the algorithm, network specialists must design the server connections needed to operate the website, and marketing specialists must focus on the features that enhance the product's quality, like any modern corporation. It is clear that the commodity ('promotion services'), the sale of which results in profits for the firms *has to be produced* through the labour of *these* individuals (and not the users of websites). The provision of online 'promotion services', which includes everything involving the designing, code-writing, networking, and managing of the platform (website/application), involves *labour,* and that is performed in the circuit of production (*P).*

Thus, the two-stage revenue process of *Facebook* and *Google* can easily be summarized within a Marxian circuit of capital model. This is seen as soon as, firstly, the distinction in this business model between 'users' and 'customers' is properly understood. The goal of the business model is the sale of the product as a use-value to the latter by *luring* the former into the network. The former (the 'user' of the website) is 'an unavoidable middle', a mere 'condition' of existence for this concrete kind of capital to *serve* as capital. The *latter,* the client is the active agent in the realization of surplus-value. Thus, while the former is not charged a price for enjoying the services available at the space, the flipside of her 'free consumption' is the 'forced consumption' of unsolicited content (forced viewing of ads, promotions etc.) from the latter.[4]

[4] YouTube offers its clients, at a slightly higher price of course, the additional service of not allowing users to 'skip an ad'.

But are the profits of *Facebook* and *Google* just the result of surplus-value extractions from the workers that they directly hire? As we have seen, the key to the business model is the generation of 'traffic'. So is all the traffic generation on these companies the result of only their employees?

Certainly not. A host of *independent* labourers (artists, musicians, game developers, application designers etc.), spread out all across the globe also upload content that they *themselves* produce, incurring the labour as well as non-labour costs independently. Consider for instance a film-maker who uploads her own short videos on *Facebook.* She incurs the labour and non-labour costs *herself* and uploads the content on the website. While she is *not directly* hired by these companies, yet it is abundantly clear that her labour generates traffic *for* the website. Given this traffic that has resulted from her labour, she can directly charge 'customers' a price for 'promotion services' on her page. But this *possibility* is aborted by the *fact* that *Facebook* owns the platform on which she has uploaded the product of her labour and for this "service", she has to pay a cut to the company from the revenues that she makes from selling 'promotion services' to her customers. It is crucial to remember that from the perspective of the Circuit of Capital model, this is *not capitalist* production. Rather, this traffic---and the promotion services that result from it---are the product of *independent* workers since the transaction *M-LP* did not take place, even though they engage in commodity production. The digital corporation only *facilitates* the sale of promotion services which resulted from traffic generated by the labour of the independent worker. For performing the role of the 'middle-man' in this arrangement, *Facebook* charges these individuals a fee. This fee is a *distribution* out of the revenues made by *independent labourers.* Thus, the profits of digital corporations such as *Facebook* and *Google* can be summarized by the following equation:

$$\pi = SVempl + SVdist$$

Where *SVempl* and *SVdist* refer to the amount of surplus-value extracted directly from the exploitation of their own employees engaged in the production of 'promotion services', while the latter refers to *distributions* received from independent labourers (working on a non-capitalist basis). It is important to note that these 'independent' labourers are not the 'users' or 'audience' of Fuchs (2014) and others. Unlike the 'users' who passively watch content that is uploaded online, these people perform *labour* and incur costs of production to produce their videos, songs etc.

As we can see, in either case, the firm's profits are the result of unpaid labour extractions from these people in addition to surplus-value appropriated directly from their own workers. To summarize: digital profits cannot be made without

the production of online promotion services---the commodity produced and sold by *Facebook* and *Google*. Promotion services, in turn, cannot be produced without the labour of individuals directly hired by these corporations as well as the labour of independent workers spread out all across the globe.

Conclusion

Existing political economy theories of digital production fail to provide a satisfactory explanation of the *source* of the monopoly profits of digital corporations. Three major kinds of theoretical formulations have been proposed in recent years. The first account that assesses the implications of digital work for Marxian value theory follows the tradition of Hardt and Negri (2004) and Negri (2009) in proclaiming that "immaterial labour" exerts such a profound transformative impact on the way we produce and work that Marx's theory of value fails to account for it completely. A second line of inquiry, seeking to salvage value theory from these sceptical critiques, responds in two main ways. In one line of defence, despite internal theoretical nuances, the idea of digital 'production' is avoided altogether by positing these firms as rent-seeking digital landlords performing 'unproductive' and/or 'advertising' labour to extract revenues from value-producing industrial capitalists. An alternative line of inquiry, which disagrees with the rent-based approaches on the very valid grounds that "rented assets are not *produced* on a continuous basis" (unlike *Facebook* and *Google),* invokes the seemingly bizarre hypothesis that *'audiences*' (the users of Facebook and Google) perform 'unpaid labour'. In each case, as I argued in this paper, these theories fixate on one or another superficial differences in form between traditional ('material') and digital ('immaterial') labor: either the concrete *form* of labour, the *physicality* of the commodity, or on the conundrum of how 'free' use of websites/applications is compatible with commodity production at all. Rent-based approaches fail to take account of the 'fact of production' itself. They avoid the problem of value by assuming production away from the analysis. In contrast, audience-labour approaches accept 'production' but invoke 'audience-labour' to account for digital labour, thus conflating 'consumers' with 'direct-producers'.

To present a clear and consistent theoretical account of capitalist production in digital corporations this paper offered a 'Circuits of Capital' model that is consistent with Marx's analysis of capitalism in *Capital.* As we saw, this allows us to first and foremost distinguish the 'commodity' that digital corporations like Facebook and Google produce: 'promotion services'. The 'free' searches that users are allowed to conduct on *Google* or the 'free' accounts of users on Facebook that baffle audience-labour and rent-theorists alike, are *not the commodity sold by these companies*. Rather, it is the sale of 'promotion services' *in that free network* that is being produced and sold on a commodity basis by these companies. Next, we saw that it is only *once* that the commodity (and hence

the customer) is clearly identified that we can even begin to talk about the 'direct-producers' who engage in the act of producing 'promotion services' on a capitalist basis. This we saw consisted of two main types of unpaid labour extractions: 1) those made from workers directly hired by these firms; direct surplus value appropriations; and 2) those made from *independent* labours uploading their content on the platforms provided by these corporations; from whom these corporations receive surplus value *distributions.*

Thus, digital production does not mark the end of Marxian theory of value as Hardt and Negri (2004) and others who follow them have incorrectly concluded. Rather, digital space represents a new site for the exploitation of labour by capital. The promises of the "Fourth Industrial Revolution", like its predecessor, will remain unfulfilled for the working class as long as capitalist relations of production----the buying and selling of labour-power and commodity production----remain the dominant form of organizing work in human societies.

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THE ECOLOGICAL AND SOCIAL POWER OF SLOW TOURISM FOR SENSITIVE YET PROFITABLE ENVIRONMENTAL SUSTAINABILITY: INTERNATIONAL INSIGHTS FOR AIRLINE AND BUSINESS TRAVEL FROM INTERCULTURAL STUDENT AND SPIRITUAL STAKEHOLDERS

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Abstract:

Slow travel's key themes are environmentalism, sustainability, and low-to-no carbon emissions. Slowness has several practical and spiritual dimensions of meaning, central to which are environmental ones. As an opposite to slow tourism, airline travel has developed quickly in terms of airplanes, liberalization and technology, all related to the industry's efforts at more sustainability, but conflicting and seeking solutions within the airline and tourism industries, their customers and the global environment. Business travelers' motivations, decision-making and beneficiaries moved environmental and sustainability considerations up on its agenda, in contrast to traditional forms of business encounters. Youth and student travel grows in size and importance corresponding to the complex matrix of interests of its travelers and societies. Religious tourism has become a key sector of global tourism, with implications for religious sites' economies and environments. Altogether, increasing social and environmental considerations of fast travel forms and competitive industries as well as outlooks have come to be inspired by as well as enriched by more contemplative forms of slower tourism. It turns out that traditionally fast and less environmentally friendly and sustainable forms of travel and tourism approach many philosophical and practical tenets of slow tourism forms, especially sustainability, while traditionally slower and more contemplative kinds of tourism re-orient themselves to accommodate modern global travel facilities such as an increasing use of technology. This is an ongoing and interactive development that promises to put high demands on, yet likewise to benefit the here analyzed stakeholders and forms of travel.

Key Words: Sustainability, Slow Tourism, Airline Travel, Business Travel, Student Travel, Religious Tourism.

JEL Classification: Q56, Q57, Z30, L83.

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Slow Tourism's Sustainability

Development of Slow Travel

In the 1980s, an emphasis on quality of life, slower pace, relaxation, individuality, traditional culture and on cultural, local or ecological heritage gave rise to "slow" movements such as the Italian *Cittáslow* ("slow cities") or "slow food" movements. Some see the slow movements connected by organic sustainability, respect for the seasonality and rhythm of travel, or their affective or multi-sensory dimensions, which allow to explore places and sights, but also feelings, sounds or tastes.

"Slow travel" or "slow tourism" is considered as a "viable" alternative to car or plane travel, being mostly "conducted" or "performed" over land or water, by means of foot, bicycle, train, coach, bus, ferry, canoe, kayak or sailing boat. It enables a more intense exploration of, engagement with, and enjoyment through the available or chosen transport, the destination and the localities, in a sustainable, supporting, conscious relationship with the environment, such as local landscapes and cityscapes. The slow speed and the time constraints of most people set limits to the mileage that can be achieved. This makes slow travel more suitable for short-to-mid-haul and intra-continental travel. Slow travel is then more likely the domain of relatively affluent and unbound tourists, such as backpackers on long vacations.

Recommended slow *actions and activities* are stopping at local markets, engaging with communities, emulating the locals in terms of habits such as eating or resting, or practicing the local languages and dialects. Desirable slow *attitudes* are seeing the journey as part of the pleasure, seeking out the unexpected, embracing lost connections on trips, or giving back to local communities. Slow *travel* sees the means and the time of transport and traveling as valuable parts of the vacation experience. Slow *tourism* applies to the destination and related activities, such as engaging with local landscapes and people. Hence they are two sides of one coin, characterizing the way to and within the destination.

Environmental Considerations

While *green* travel focuses on technical aspects of transport, such as resource use or carbon dioxide and greenhouse gas emissions, *slow* travel sees environmental considerations as significant, but not sole driver of the journey. Travelers with central environmental considerations are labeled "hard slow travelers," while "soft slow

travelers" prefer either a slow travel mode or the slow experience, but consider environmental benefits just an added bonus.

Some hold that slow travel is also possible by cars, since, full to capacity, they rival trains for fuel- and carbon dioxide-efficiency per passenger kilometer. Others argue that: cars are usually not filled to capacity; worldwide on average, cars are not very fuel-efficient; for holidays, typically larger, emission-intensive and less environmentally friendly family cars or vans are used; and a car available at the destination often means longer or unnecessary trips.

Some hold that no special environmental actions or consciousness is required for slow travel, as it is about doing things with the right attitude towards time, and prioritizing quality over quantity of experience. Others maintain that the slowness of non-consumerist experiences implies minimizing the environmental or emissions footprint, thus making slow travel by definition environmentally friendly.

Slow travel is also associated with efforts of a low-to-no carbon footprint. The worldwide tourism industry's emissions consist of: transport 87%, accommodation 9%, and tourist activities 4%. As transport has the largest share, slow tourism is considered as promising towards low-to-no carbon emissions. This especially since planes and cars are said to produce three to ten times more carbon dioxide per passenger kilometer than trains and five times more than coaches. Further suggestions to reduce the carbon footprint of slow travel are: longer stays, longer but fewer holidays, slow journeys combined with slow destination experiences, or several slow travel modes to and within the destination.

The slowest of all travel forms, relying only on the traveler's body, walking is the most direct, close and intense engagement with people and environments. The term 'budget' travel is rarely used for walkers, as cost considerations are not essential for them. "Hard slow travelers" relate walking to the immediacy and simplicity of sensory experiences, such as the contrasts between city and country, coast and desert, cave and mountain, of being in tune with local populations or fellow travelers, or of exploring the topography.

Cycling traditionally has the flair and ethos of being slow, sustainable, low-carbon, and an individual lifestyle statement. Besides physical benefits, cyclists often name the bike's flexible sociability as their reasons of choice: only the terrain (roads, cycle paths, cross-country) limits their experience, so stopping, starting, pausing, or

meeting other travelers is uncomplicated compared to train travel. While cycling can be disconnected from environmental concerns, its travel and recreational activity has the strongest symbolical value of environmental friendliness among slow travel forms.

Many see train travel as the ideal slow travel form: changing vistas to avoid boredom yet allowing observation of landscapes and people, and offering the choice between relaxation, observation, or interaction with fellow travelers. Most relevant for slow tourist travel are intercity trains between cities or countries. Short-distance trains (within around 100 kilometers) or long-distance trains (between 500 and 1000 kilometers) can pass one or several countries and scenic landscapes. Some doubt that high-speed or bullet trains (up to 500 kilometers per hour fast) are still slow travel. Yet apart from the time and distance covered, all aspects of train travel apply to them too.

Coach networks (such as Greyhound) serve even remote or rural destinations, thus are often associated with exploration. Their benefits are affordability; their downsides, limited space and comfort. Logistically between the coach and the car, hitchhiking benefits car driver and hitchhiker: both are entertained; the driver remains alert and the hitchhiker can acquire local knowledge. Hitchhiking has considerable environmental potential by improving car loads and reducing carbon footprint, outweighed however by considerations of social appropriateness and personal safety.

Some freighter or cargo vessels offer cruises with accommodation, without the amenities of ocean liners but much cheaper. Ports enable authentic local exploration but require flexibility, making it less suitable for very young, old or time-bound travelers. By contrast, small pleasure craft like canoes, kayaks or sailing yachts allow for very individual routes. The Caribbean is popular for charter, the Mediterranean for cruise trips. Yet even low-carbon water travel can upset local ecology (wildlife or habitat) by erosion or waves, water quality (sediments, spillage, or fuel or exhaust waste), or cause noise or air pollution (via motorized vessels, or sail boats towed into ports). Additionally, even low-carbon water travel often depends on high-carbon infrastructure, such as flights to or drives within destinations.

The Future of Slow Travel

Three future scenarios are: 1) slow travel continues as a market niche of alternative tourism, chosen by middle-class travelers from developed countries or by socio-economically disadvantaged groups with few alternatives; 2) slow travel becomes mainstream as low-carbon travel, provided changes in tourist and industry behavior; 3) slow tourism develops differently across global transit regions, depending on infrastructure quality. Overall, slow travel aspires to be a credible "new," "alternative" or "green" tourism.

Environmental Considerations of Airline Travel

Since the turn of the millennium, the airline industry is increasingly balancing passenger capacity with environmental demands. Under the 1997 Kyoto Protocol, tradable emission permits have become a key element of international climate policy. Carbon offsetting is seen as corporate commitment towards carbon neutrality. Some airports have restructured themselves accordingly; however, important questions remain, such as contesting their "spheres of responsibility" or "ownership of emissions" (from their planes' starting to them landing, including taxying and parking).

Implementing environmentally friendly policies will require increasing cooperation of governments and airports, and will depend on available technological solutions (such as emission filters), adopted policy measures (such as emission charges, fuel taxes, or restraint measures), and customer choices influencing the market (such as the selection of airlines for travel, or stock market investments in them). Overall, the airline industry tries to be ahead of the game for instance by innovative products, such as the Airbus 380, whose structure weight is made of up to one fourth of composite materials.

Social Considerations of Business Travel

Traditional business tourism has due to progress in collaboration software that enables sophisticated video conferences, replacing physical face-to-face meetings with virtual ones, and alleviating the burden on time, money and environment in the form of air travel, accommodation, and pollution, and giving new meaning to the

terms "working out of the office" or "working anywhere," thereby also enhancing the work-life balance. Some forms of traditional business encounters are still wanted, such as for sales or development people and major deals. But altogether, the return on investment of virtual travel is said to be superior to business travel.

Others maintain that, as transnational companies become ever more important for business tourism, extending and diversifying their global reach and their international dependencies, and relying on telecommunication technology only on lower and medium management levels, face-to-face meetings are still useful for global-level coordination. But even in that case, companies are increasingly asked by their stakeholders (whether governments, shareholders, employees, or residents) to consider their environmental impact, such as their carbon footprint. This means that while a few aspects and types of companies of business tourism might afford to ignore environmental considerations, most of its "user-intensive" travel forms seem to adopt them increasingly.

Stakeholders of International Tourism

Travelers

Stakeholders of a company or an organization are all who are interested in, or affected by its activities. Stakeholders of international tourism can be private, public or business individuals or groups (travelers, organizations or corporations). Travelers can broaden their personal horizons with new experiences and knowledge of other peoples and reduce their prejudices, or discover or engage deeper with issues of environmental preservation and protection, or promote peaceful relations among countries.

Destinations and Hosts

Residents expect tourism to serve their interests above those of other stakeholders. Travelers contribute to the economic growth and development of host communities by buying locally produced goods and services such as food, accommodation, clothing, equipment, transportation, or additional cultural or educational activities. Many developing national economies are torn between their need of tourism profits and the socio-environmental costs of unregulated tourism development. Hence they

try to prevent further deteriorations of their natural or built environment by unsuitable tourism complexes.

Also, negative experiences might let them develop xenophobia, or pursue harmful actions such as prostitution or drugs. Yet tourism might also protect or conserve their landscapes, monuments or buildings, for instance by raising industrial, architectural or environmental standards. In any case, conflicts, wars, natural disasters, and the spread of communicable diseases remain the gravest concerns for developing countries.

Multinational Corporations

Multinational corporations' global mergers and acquisitions (such as *ITT Sheraton* for hotels, *Star Alliance* for airlines, *Thomas Cook* for agents, or *Gray Line Worldwide* for operators) enable them substantial economies of scale and thus profits even from small margins. But the pressure from continuous product development and aggressive low-price marketing also hampers sustainable development. Corporate social responsibility aims to enrich classical economic outlooks with social concerns, such as ethical or environmental business behavior, improving the quality of life of residents, communities, tourists and society, thus benefiting all tourism stakeholders. Yet many businesses feel that their capacity for socially responsible actions is limited by their profit margins, disadvantaging them to other sectors that do not have such restrictions. However, even they concede that corporate social responsibility can be successful, provided reasonable financial margins. This double goal can be achieved with a good public relations department.

Tourism for World Peace

For politically, economically and socio-culturally beneficial tourism, these elements have been suggested: 1) Protecting and encouraging cultural diversity in all areas of the tourism industry; 2) Reducing poverty by employing residents and local businesses for fair wages, and involving them in decision-making processes; 3) Avoiding to support conditions that lead to acts of conflict or violence; 4) Engaging in sustainable development by educated or at least caring ecotourism; 5) Physically and spiritually respecting peoples, traditions, spaces, and sacred or heritage sites; and 6) Supporting only tourism businesses which follow these principles.

Student Traveler Stakeholders

Students travel less long, but more often; explore more destinations; spend more on travel, relative to their income; book more travel on the internet; are relatively undeterred by terrorism, natural disasters, or pandemics; aim at experiences involving local people; innovate technologically and socially; and exemplify responsible and sustainable tourism. Students see travel as a way of life and element of their identity, consisting of learning, meeting people, places and cultures, personal and professional development, and reinforcing positive values.

Student travel can thus contribute to the development and well-being of travelers, stakeholders, and societies educationally (broadening minds and horizons, accepting other cultures, questioning stereotypes, enhancing motivations, and improving interpersonal communication, self-awareness and confidence); culturally (raising trust, understanding, tolerance and compassion among peoples); politically and economically (stimulating or supplementing national outlooks, institutional programs, economic aid, or poverty relief); and socially and ecologically (being role models for interactions with host cultures and destinations through respectful and sustainable tourism). These elements parallel those of tourism for world peace, once more showing the interconnectedness of this paper's issues.

Religious Tourism Stakeholders

Many religious sites were built in remote and pristine (such as mountainous) locations, fitting the ideal of pilgrimage as caring for the natural and social environment, and mediating between the natural, cultural and supernatural worlds. For example, Taoism and Buddhism venerate mountains (Chinese Buddhism's Four Sacred Mountains Wutai, Jihua, Putuo, and Emei are regarded as a bodhimanda, enlightened place, for a bodhisattva, enlightened being). Thus conflicts between sites' environmental and economic interests may erode their spiritual value. For example, the murals in northwest China's Dunhuang or Mogao Caves (or Caves of the Thousand Buddhas), painted between the 5th and 14th centuries across 577 grottos and 45,000 square meters, are being damaged by the many tourists who raise their internal temperatures.

Likewise, several of the 112 cultural tourist attractions on one of the four biggest Taoist mountains, Mount Wudang in central east China have been damaged, especially the Taihe (Golden Peak) and Zixiao (Purple Clouds) Palaces, while in the Taizi (Prince) Valley, the local government has constructed a concrete dam to raise the local water table for tourist leisure. Reacting, many religious tourist sites in China forbid littering, inscribing or photographing murals, open cooking, tree-cutting, or fireworks. Similarly, Santa Katarina Monastery at the foot of Egypt's Mount Sinai (or Jebel Musa) has benefitted from Egyptian, European and United Nations protection, preservation and awareness initiatives, and asks its daily 2000 visitors (and 300 nightly mountainside campers) not to pollute it in any way.

Conclusion

Many of the traditionally environmentally harmful ways of travel (air, business) increasingly realized ways to combine profits with more ecologically considerate ways. Other forms, such as religious or student travel, had ecological and environmental considerations more built-in as part of their self-understanding, and even they continuously look for ways to improve and integrate them into their guest, host and site experiences. International tourism's facets reflect the insight that better business can be achieved not despite, but because of better environmental and social considerations.

Especially the seeming oxymoron between slow travel on the one hand and airline or business travel on the other hand makes course-changes of "fast travel" so interesting, insightful and valuable for slow travel. Likewise, the efforts of fast travel seem to be spurred by the philosophies, self-understanding and interactive ways of slow travel. Youth and student travelers might, due to their age, dynamism and possible future career aspirations, be familiar or even strive for environmentally or socially taxing travel forms as airline or business travel, while at the same time embodying (due to financial restrictions, but also inspired by deeper insight) more socially and environmentally-friendly travel forms, such as low-to-no carbon emissions and footprints.

Altogether, the relationship between slow and fast travel seems to be increasingly developing, interactive, and relevant for us to contribute to it, in daily life and further research.

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STRUCTRAL CHANGE, DISCRIMINATION AND FEMALE LABOR FORCE PARTICIPATION

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Abstract

Economic development of industrialized economies is characterized by structural transition towards service economy and rising female employment, especially in the service sector. This paper highlights how macroeconomic mechanisms explain increasing female labor supply. While structural change generates rising participation of women in the labor market, statistical discrimination in female wages has the opposite effect. A multisector model of growth is constructed, which includes two economic sectors and a home production technology. Qualitative results of the model emphasize different sectoral productivity growth as driving force of female labor supply. Additionally, statistical discrimination of women in the labor market explains why the classical role allocation of men and women in household activities persists.

Key words: Female Labor Supply, Structural Change, Home Production, Statistical Discrimination

JEL Classification: D13, E24, H31, J22, O11, O41

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Introduction

Structural change is a striking feature throughout economic development, meaning that with increasing income the economy initially shifts away from agriculture to industry and later on to services (Kuznets, 1973: 248). In line with Fuchs (1980), Kongsamut, Rebelo and Xie (2001: 869) as well as Ngai and Pissarides (2007: 429) this paper concentrates on structural change as the reallocation of labor across the three main economic sectors agriculture, industry and services. Święcki (2017: 95) summarizes two classical sources of structural change. On the one hand sector-biased technological progress leads to a shift of activities among sectors. If there is relatively little technological progress in the service sector compared to other sectors and if services are poor substitutes to other consumption goods, there is a reallocation of economic activities towards the sectors with relatively low productivity growth. On the other hand non-homothetic preferences lead to a shift of household's expenditures away from consumption goods produced in the agricultural sector towards services if income increases.

In this paper both mechanisms are implemented in order to analyze the household's labor supply decision. Following Akbulut (2011: 242-246), non-homotheticities in preferences and sector-biased growth in labor productivity explain the reallocation of economic activities from agricultural and industrial sector to the service sector if income increases. Related to Ngai and Pissarides (2008: 240-242) and Rogerson (2008: 236-245), differences in sectoral labor productivities result in so called marketization of home production, meaning a movement of resources from home production into market production. For example, if productivity growth of market services is high relative to home produced services, activities are reallocated to the market, if home- and market produced services are highly substitutable. Because services have relatively good home produced substitutes compared to goods of the other main sectors, marketization is in favor of services (Akbulut, 2011: 247- 250).

Since the second half of the 20th century not only structural transition from industry towards service economies is observed but also the economic role of women changed.[1] There are several approaches explaining why more and more women enter the labor market. For example, Albanesi and Olivetti (2009) highlight the introduction of infant formula and medical progress in general as support for female labor force participation. Quite close to this

[1] Like Iscan (2010: 2) the concept of service economy abstracts from is occupational structure of employment. Even though female employment is often connected to occupational choices this paper concentrates on the industrial structure of employment.

approach is the rising provision of oral contraceptives, which facilitates female career management (Goldin and Katz, 2002).

Next to medical improvements technological progress in form of affordable consumer durable goods (e.g. washing machines) enabled women to spent less time in household production and reallocate time to the labor market (Greenwood et al., 2005). Jones et al. (2003) find that the narrowing of the gender gap is connected to an increase in average hours worked by married women. On the contrary, technological progress in household production technology has only a small effect on female labor supply. Galor and Weil (1996) emphasize that general technological progress stimulates capital per worker, which again complements that kind of labor in which women have a comparative advantage. As a consequence female relative wages and female labor supply are rising. Rising relative wages are often used to explain increase women's labor supply. Siegel (2017) argues that with decreasing gender wage gap, relative wages become more equal. Therewith time allocations of men and women between market work and home production becomes more equal as well. Next to the decline of the gender wage gap Attanasio et al. (2004) explain rising female labor force by a reduction of childcare costs relative to life-time earnings.

An alternative approach is based on the work of Akbulut (2011), who developed a time allocation model to reconstruct relationship between structural changes and female employment in the United States. The economy is simplified to two market sectors, goods and services, and home production. Services are assumed to be either produced in the market or at home, so that home production means the production of non-market services. Differences in relative changes in productivity growth among services and home activities result in increasing female labor supply if market and non-market services are highly substitutable and the service sector is more productive (Akbulut, 2011: 247-250).[2] Ngai and Pissarides (2008, 240-242) use the marketization mechanism to reconstruct the shift from home production to agriculture and manufacturing in early stages of structural transition, as well as the employment shift from agriculture and manufacturing to services. Comparatively, marketization is possible from home production towards the service sector.[3]

[2] Freeman and Schettkatt (2005) state that time in home production and market work are greater substitutes for women than for men, but they do not explicitly take the importance of the service sector into account.
[3] Earlier approaches like Fuchs (1980: 18-25) argue that increasing employment in the service sector is also generated by rising female labor force participation. If the female spouse is working in the labor market the household's expenditures on services are relatively higher.

Most approaches deliver explanations for increasing employment of women. This paper concentrates on the question why, despite all achievements, female participation has not caught up to male participation in the labor market. Therefore, I adopt the model of Akbulut (2011) and implement taxes and statistical discrimination. Both are assumed to be forces which reduce incentives to engage in the labor market. Adaptions are made to cope with gender-specific labor supply as well as the German labor market. Rogerson (2008: 237-255) argues that relatively high income taxation in European countries like Germany explain a slow-going structural change compared to the United States. Statistical discrimination here means that employers discriminate in wage against the specific group of women because they expect lower productivity (Phelps, 1972).

While Akbulut's work concentrates on the second half of the 20th century, my analysis focuses on the time after German reunification in 1990. Since then role allocation of men and women concerning home production changed (Knowles, 2013: 1062-1063; Siegel, 2017: 154-156). Also Ramey (2008) finds empirical evidence from the United States that time allocated to home production converges between men and women. Especially time which men in working age spent with household activities increased by 13 hours from 1900 to 2005. In order to cover this development male time allocation restrictions are loosened in favor of household activities.

The outline of the paper is organized as follows. In section 2 data concerning the German labor market is documented. Section 3 outlines a model of structural change and discrimination. In section 4 qualitative results of the model are presented. Finally, section 5 concludes the paper.

1. Data Analysis

Since the reunification of East and West Germany in 1990 structural changes in Germany are characterized by a growing service sector. The economic development from 1991 to 2015 is displayed by changes in sectoral shares of GDP and employment. In order to show the changing role of female labor force participation, data concerning employment is not only specified by sector but also by gender. Rising female labor force participation in services is the main focus of this paper. During the respective period the other two sectors, agriculture and industry, are decreasing in female employment. Thus, for simplicity, agriculture and industry are merged to one sector, namely the goods sector and put in contrast to the second sector of services.

In this paper changes in sectoral share of economic performance in Germany are displayed by Gross Value Added (GVA), which is linked as a measurement to GDP.[4] All shares presented in figure 1 are in constant 2010

prices and taken from German National Accounts provided by the German Federal Statistical Office (Destatis).[5] From 1991 to 2014 the share of services increased from 64.62% to 68.71%, which is an annual average growth rate of 0.26%. At the same time the share of goods decreased by 16.76%, which is an annual average growth rate of minus 0.76%.

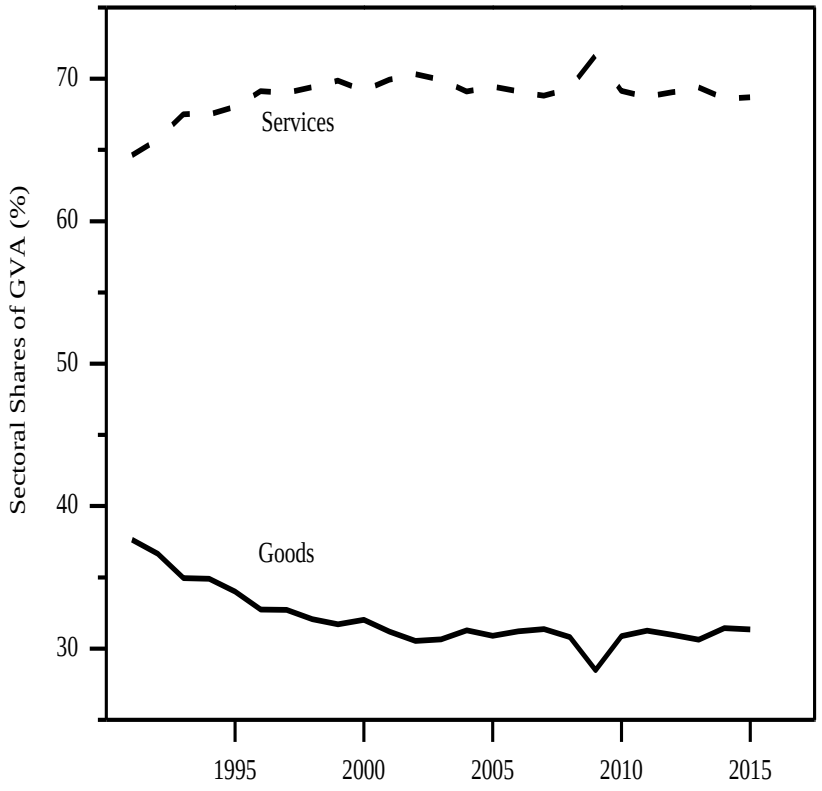

Figure 1: Sectoral shares of Gross Value Added (GVA). A price-adjusted chain-linked index (2010=100) is used to calculate real Gross Value Added by Industry. The data is taken from German National Accounts provided by German Federal Statistical Office.

[4] GDP is calculated by GVA plus taxes less subsidies on products. Generally, GDP and GVA follow a similar trend.
[5] Constant 2010 prices are calculated by Chain-linked Index. The goods sector includes agriculture, forestry and fishing, industry, including manufacturing, and construction. The service sectors includes trade, transport, accommodation and food services, information and communication, financial and insurance services, real estate activities, business services, public services, education, health, and other services.

Data concerning sectoral employment shares presented in figure 2 are also taken from German National Accounts. The employment share of services increased from 61.25% in 1991 to 74.09% in 2015, while the employment share of goods decreased from 38.75% to 25.91%. The annual average growth rate are 0.80% and minus 1.66%, respectively. Obviously, the development of sectoral shares in economic performance and employment is conjoint. In both measurement categories the increase in the service sector is conducted by a decline in the goods sector.

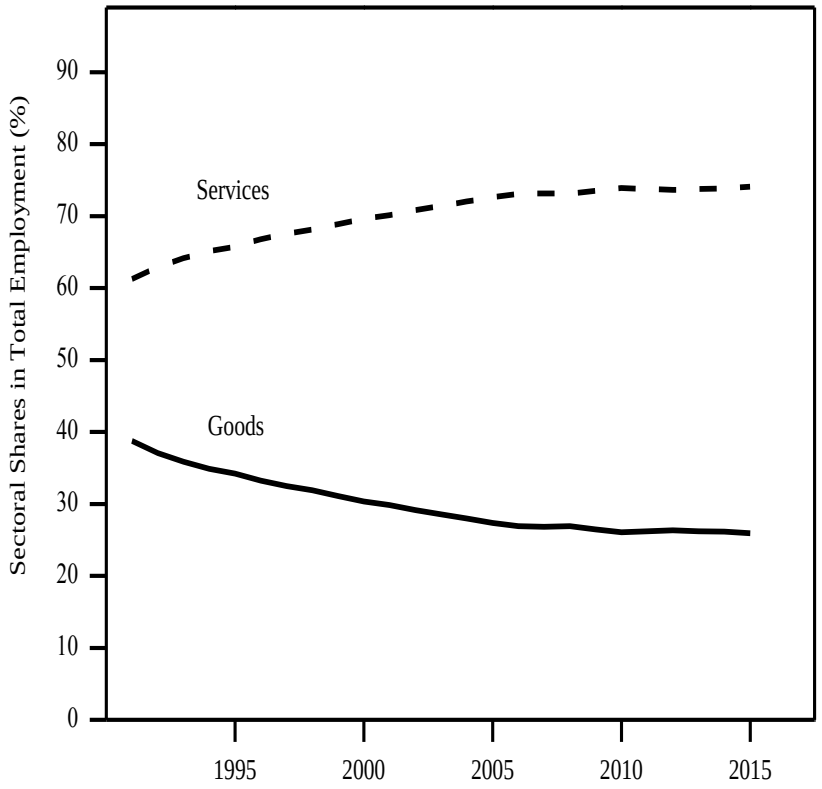

Figure 2: Sectoral employment rates. The data is taken from German National Accounts provided by German Federal Statistical Office.

Figure 3 summarizes changes in gender-specific employment. The data is taken from German Microcensus (2011 Census), which is also provided by Destatis. Total population here means working age population, which is defined from 15 to less than 65 years of age. Within 24 years the male employment rate remained relatively stable and decreased slightly from 78.40% to 77.68%. On average, this is a decrease of 0.04% every year.

Meanwhile, the female wage rate has increased by 22.46%. This implies an annual average growth rate of 0.85%. In 1991 around 57.01% of the women were employed and until 2015 the share grew up to 69.81%. In total the employment rate increased by 8.79%. To some extend this development can be explained by the narrowing of the gender employment gap.

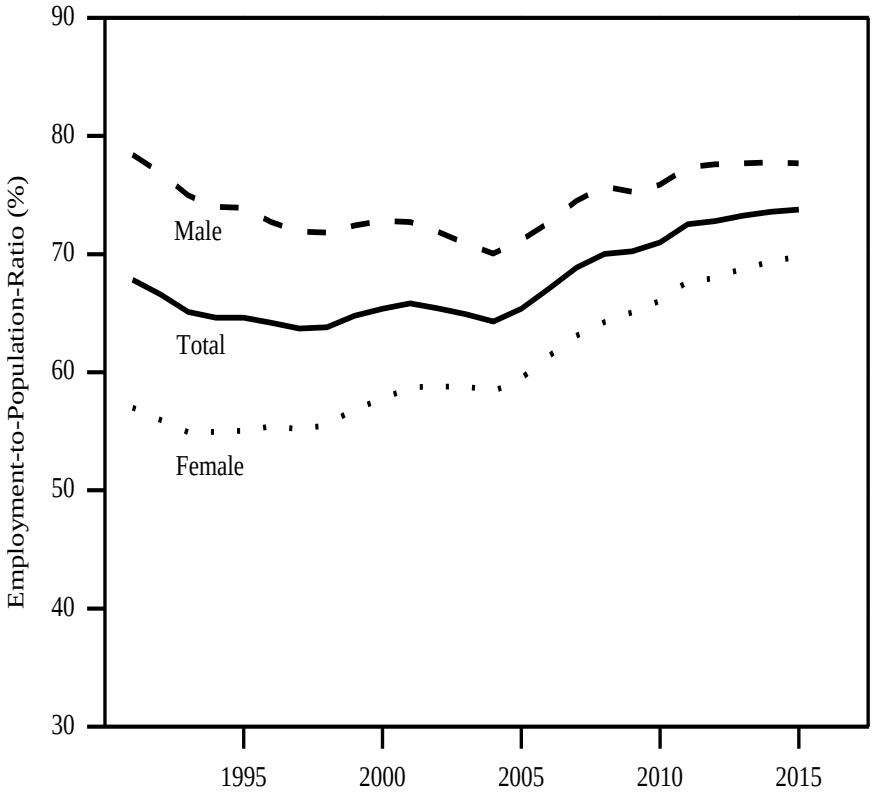

Figure 3: Employment rate by gender. The data is taken from the German 2011 Census provided by German Federal Statistical Office.

Lastly, figure 4 shows how gender-specific employment is distributed across the two economic sectors. The data is extracted from the World Banks database World Development Indicators.[6] Employment rates of both men and women are increasing in the service sector and decreasing in the goods sector. The share of women in the goods sector is relatively low. Since 2005 both gender-specific employment rates in the goods sector remain relatively steady, with about 8% for women and about 26% for men. During the entire time period the employment rate of men in services

[6] The employment-to-population-ratio by gender is modeled by ILO estimates, where population is again defined as working age population.

increased from 30.38% to 36.29%, which is an annual average growth rate of 0.78%. In comparison, the respective average growth rate of women was almost twice as high, with 1.43% per year. Including the fact that the female employment rate in services was always above the male's one, this development is a strong indicator that the rise of the service sector is one of the driving forces behind increasing female labor force participation.

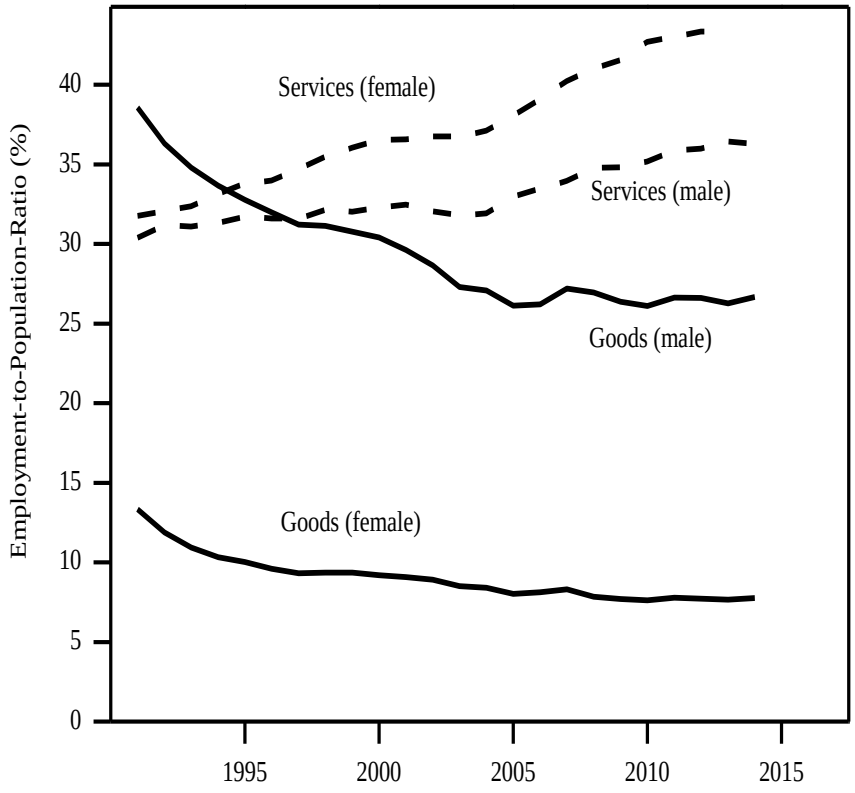

Figure 4: Gender-specific distribution across economic sectors. Gender-specific employment to population ratio (modeled ILO estimate) and employment in industry are used to calculate gender-specific employment rates by industry. The data is taken from World Development Indicators Database provided by World Bank.

2. Model

The model here is about gender-specific time allocation and based on the work of Akbulut (2011). Therefore, a representative household consists of

two members, male and female. Both members allocate their productive time across two market sectors, goods (agriculture and industry) and services, and home production of services. In contrast to Akbulut's model, men and women can both spend their time in home production. This modification is due to increasing time that men devote to home production (Ramey, 2008). In addition, the model is extended by gender-specific wage discrimination and income taxation in order to match specifications of the German labor market.[7]

2.1 Preferences

Preferences of the male and the female are united to total preferences of a representative household, which lives for an infinite time horizon. In each period t the household derives utility U from aggregated consumption C_t and leisure L_t, so that preferences are

$$\sum_{t=0}^{\infty} \beta^t U(C_t, L_t), \tag{1}$$

with $\beta \in (0,1)$. The parameter labeled β is the discount factor, meaning that the household values consumption in prior periods higher than in subsequent periods. The utility function of period t is given by

$$U(C_t, L_t) = \alpha_C \log C_t + (1 - \alpha_C) \log L_t. \tag{2}$$

with $\alpha_C \in (0,1)$. Parameter α_C denotes to the weight of consumption and $(1 - \alpha_C)$ to the weight of leisure. Consumption of the household is a composite good of industrial (and agricultural) goods G_t and services S_t. Services again are produced in the market sector S_{Mt} and at home S_{Nt} (non-market services). Both aggregators for *C* and *S* are constant elasticity of substitution functions:

$$C_t = C(G_t, S_t) = [\alpha_G (G_t - \bar{G})^{\varepsilon} + (1 - \alpha_G) S_t^{\varepsilon}]^{1/\varepsilon}, \text{ and} \tag{3}$$

$$S(S_{Mt}, S_{Nt}) = [\alpha_S {S_{Mt}}^{\eta} + (1 - \alpha_S) {S_{Nt}}^{\eta}]^{1/\eta}, \tag{4}$$

[7] Rogerson (2008: 237-255) explored that differences in income taxation explain differences in structural change between the United States and European countries like Germany.

with $\alpha_G \in (0,1)$ and $\alpha_S \in (0,1)$. The parameters α_G and α_S are the weights of consumption of industrial goods and market services, respectively. Parameter $\bar{G}$ represents the subsistence level of the household, thus the minimum of industrial goods the household consumes in each period. The elasticity of substitution between industrial goods and services is described by $\frac{1}{1-\varepsilon}$. With $\varepsilon < 0$, industrial goods and services rather complement than substitute each other. The term $\frac{1}{1-\eta}$ is the elasticity of substitution between market and non-market services. With $0 < \eta < 1$, market and non-market services are assumed as highly substitutable. As long as both elasticities of substitution are not unity, preferences are non-homothetic. This implies uneven productivity growth among sectors resulting in structural change and thus a reallocation of economic activities of the representative household. For example, if the increase in productivity is higher in the market sector compared to home production, there is a shift from home production to the market (Ngai and Pissarides, 2008: 240-242).

The households aggregated leisure is a simple function of Cobb-Douglas type:

$$L_t = L(L_{mt}, L_{ft}) = L_{mt}^{\alpha_L} L_{ft}^{(1-\alpha_L)}, \qquad (5)$$

with $\alpha_L \in (0,1)$. The male's leisure is L_{mt} and female's leisure is L_{ft}. The parameter labeled α_L represents the share of male's leisure in respective to the total amount of time the household spends with leisure.

2.2 Time restrictions

The main assumption in this model of time allocation is that each household member is endowed with one unit of time, which can be spent for productive activities and leisure. Productive activities can be performed in the market sectors for goods and services, and home production of services. Though, each household member can work in more than one sector. This helps to translate the time allocation decision of the representative household, which is on the intensive margin, to the extensive margin decision, whether to work.[8] The household consists of two members of each gender, whose time allocation stands for the fraction of people who are employed the in diff erent sectors (market and non-market) and the fraction of people spending their full time with leisure (Akbulut, 2011: 246).

[8] In the data section changes at the extensive margin are expressed by employment-to-population-ratio.

A deduction from the data section is that women in this model do not work in the goods sector. The fraction of women in this sector was relatively low decreasing and lastly steady over time. This model concentrates on changes in time allocation of women due to an increasing service sector. In contrast to the model of Akbulut (2011) men are not excluded from home production of services.

This is due to the fact, that my model analyses a later time period than Abulut's model, in which the participation of men was relatively low. The time allocation constraint for male household member is

$$1 = H_{mGt} + H_{mSMt} + H_{mSNt} + L_{mt}, \quad (6)$$

where H_{mGt} is the time the male devotes to the goods sector, H_{mSMt} is the time the male devotes to the sector of market services, H_{mSNt} is the time the male devotes to home production of services, and L_{mt} is the male's leisure. The time allocation constraint of the representative female is given by

$$1 = H_{fSMt} + H_{fSNt} + L_{ft}, \quad (7)$$

where H_{fSMt} is the time the female devotes the production of market services, is H_{fSNt} the time the female devotes to production of non-market services, and L_{ft} is the female's leisure.

2.3 Production Technologies

Assuming labor as the only input factor, production technologies are linear in labor. Production technologies for the three sectors (market and non-market) take the following forms:

$$G_t = A_{Gt} H_{mGt}, \quad (8)$$

$$S_{Mt} = A_{SMt}\left(H_{mSMt} + (1-\delta)H_{fSMt}\right), \text{ and} \quad (9)$$

$$S_{Nt} = A_{SNt}\left(H_{mSNt} + H_{fSNt}\right), \quad (10)$$

where A_{Gt}, A_{SMt}, and A_{SNt} specify productivity parameters for goods, services, and home production of services, respectively. Because the model abstracts from capital, each of these parameters represent sector-specific labor productivity. All productivity parameters are exogenous, meaning that

a change in reallocation of resources will not change the productivity of a particular economic sector. This paper aims to explain how uneven technological change in productivity results in a shift of resources among market sectors and home production (Akbulut, 2011: 247-248).

Again, an assumption is that only men work in the goods sector, but production of market services and non-market services is not restricted by gender. The parameter δ reflects the discriminatory wage differential coming from statistical discrimination. According to Phelps (1972) employers discriminate specific groups because they expect lower productivity and therefore value information costs about individual applicants or employees as relatively high.

Statistical discrimination does not contradict neoclassical assumption concerning profit maximization of the firm or competitive markets. Although this kind of discrimination should disappear due to competitive forces, the firm still faces the problem of asymmetric information about future preferences of female labor supply (e.g. maternity leave) leading to a persisting gender gap (Blau and Kahn, 2016: 34-35).

2.4 Government

In the model governmental interference in the economy is kept simple. Taxes are only on productive market activities. This implies that income from labor in the market sectors are taxed but not household production. Following Rogerson (2008: 247-248) and afore Prescott (2004: 6) there is a proportional tax rate τ on labor income and lump-sum transfer T to the representative household. The government budget constraint takes the following form:

$$T = \tau\left(w_{mGt}H_{mGt} + w_{mSMt}H_{mSMt} + w_{fSMt}H_{fSMt}\right), \qquad (11)$$

where T represents governmental spending, which is assumed to be fully returned to the households as transfer to household consumption. The other side of the equation represents tax revenues from labor income of households, where w_{mi} is the male wage rate in goods and service sector, respectively. Note that female wage rate in the service sector w_{fSMt} diff ers from male's wage rate because of statistical discrimination.

2.5 Equilibrium

The equilibrium in this economy is competitive. Resources in each period t will be allocated so that firms maximize their profits, the representative household maximizes its utility and all markets are clear. Firms are either in the goods or service sector. Profit maximization of a representative firm in the goods sector is

$$\max \Pi_{Gt} = P_{Gt} G_t - w_{mGt} H_{mGt}, \quad (12)$$

where P_{Gt} is the price of goods and w_{mGt} is the wage of men working in the goods sector. In the service sector both men and women are employed. Firms are assumed to expect lower productivity of women and hence discriminate in wage for profit maximization:

$$\max \Pi_{SMt} = P_{SMt} S_{Mt} - \left(w_{mSMt} H_{mSMt} + w_{fSMt} H_{fSMt}\right), \quad (13)$$

where P_{SMt} is the price of services, w_{mSMt} is the wage for men, and w_{fSMt} is the wage for women in the service sector. Considering free labor mobility among sectors, equilibrium wages for men are

$$w_{mGt} = w_{mSMt} = w_{mt}. \quad (14)$$

Due to the assumption that only men can work in both market sectors, w_{mt} is the male's equilibrium wage rate. Profit maximization in the service sector and equation (14) result in

$$P_{Gt} \cdot A_{Gt} = w_{mt} = P_{SMt} \cdot A_{SMt}, \text{ and} \quad (15)$$

$$w_{fSMt} = (1 - \delta) w_{mt}. \quad (16)$$

Thus women are paid a fraction of male's equilibrium wage, because of the lower expected productivity. The representative household faces a maximization problem with given prices, income tax rate τ, and transfers to private consumption T. In each period to the household solves

$$\max U = \alpha_C \log\left\{\alpha_G (G_t - \bar{G})^{\varepsilon} + (1 - \alpha_G)[\alpha_S {S_{Mt}}^{\eta} + (1 - \alpha_S){S_{Nt}}^{\eta}]^{\varepsilon/\eta}\right\}^{1/\varepsilon} \quad (17)$$

$$+(1-\alpha_C)\log\left\{\left[1-H_{mGt}-H_{mSMt}-H_{mSNt}\right]^{\alpha_L}\left[1-H_{fSMt}-H_{fSNt}\right]^{(1-\alpha_L)}\right\},$$

subject to budget constraint

$$P_{Gt}G_t + P_{SMt}S_{Mt} \leq (1-\tau)\left(w_{mGt}H_{mGt} + w_{mSMt}H_{mSMt} + w_{fSMt}H_{fSMt}\right) + T, \qquad (18)$$

home production technology

$$S_{Nt} \leq A_{SNt}\left(H_{mSNt}+H_{fSNt}\right), \qquad (19)$$

as well as time restrictions in (6) and (7), and non-negativity constraints. Solving the optimization problem for the representative household can be interpreted as a social planner's problem. The social planner decides over time allocation of the representative male and female. With all markets clear, the allocation problem for the male can be displayed with:

$$\frac{A_{Gt}}{A_{SMt}} = \frac{S(S_{Mt},S_{Nt})^{\varepsilon/\eta}{S_{Mt}}^{\eta-1}}{(G_t-\bar{G})^{\varepsilon-1}}, \text{ and} \qquad (20)$$

$$\frac{A_{SNt}}{(1-\tau)A_{SMt}} \leq \frac{\alpha_S}{(1-\alpha_S)}\left(\frac{S_{Mt}}{S_{Nt}}\right)^{\eta-1}. \qquad (21)$$

The left side of equation (20) shows the marginal rate of transformation between production in the market sectors, goods and services. The right side shows the respective marginal rate of substitution. Since work in either of the market sectors is taxed, the male's allocation decision between goods and service sector is independent from income taxation. This is not the case for market and non-market services, where the latter is not taxed.

In equation (21) the (tax-distorted) marginal rate of transformation between market and non-market services is equal or less than the respective marginal rate of substitution. If the income tax is relatively high, working in the service sector is less attractive compared to home production. In other words, a relatively high tax reduces the incentive to substitute non-market with market services. This also applies to the female's allocation problem between market and non-market services:

$$\frac{\alpha_S}{(1-\alpha_S)}\left(\frac{S_{Mt}}{S_{Nt}}\right)^{\eta-1} \leq \frac{A_{SNt}}{(1-\tau)(1-\delta)A_{SMt}}. \quad (22)$$

But here, the marginal rate of transformation is equal or greater than the marginal rate of substitution. The statistical discrimination factor operates like an additional tax on female's work in the market sector and thus reduces the attractiveness of substituting home production with market services. Merging (21) and (22), the representative household's allocation problem between market services and home production can be summarized by

$$\underbrace{\frac{A_{SNt}}{(1-\tau)A_{SMt}}}_{MRT_m} \leq \underbrace{\frac{\alpha_S}{(1-\alpha_S)}\left(\frac{S_{Mt}}{S_{Nt}}\right)^{\eta-1}}_{MRS} \leq \underbrace{\frac{A_{SNt}}{(1-\tau)(1-\delta)A_{SMt}}}_{MRT_f}. \quad (23)$$

During further analysis the male's and female's marginal rate of transformation is labeled as MRT_m and MRT_f, respectively. The marginal rate of substitution between market and non-market services is labeled as MRS. Applying equations (9) and (10) in the upper equation, algebraic transformation results in the relative time allocation of both gender in services and home production:

$$\underbrace{\frac{H_{mSNt}+H_{fSNt}}{H_{mSMt}+(1-\delta)H_{fSMt}}}_{Time\ allocation} \leq \underbrace{\left[(1-\tau)\frac{\alpha_S}{(1-\alpha_S)}\left(\frac{A_{SMt}}{A_{SNt}}\right)^{\eta}\right]^{1/\eta-1}}_{Relative\ productivity}. \quad (24)$$

The left part of equation (24) represents the household's time allocation between market work and home production, whereas the right hand side equals to the relative productivity between market and non-market services. If relative productivity between market and non-market services changes, there is also a shift of the household's time allocation between market work and home production. Suppose that at least one of the gender-specific marginal rates of transformation equals the marginal rate of substitution, the inequality sign in equation (24) dissolves. Hence, there are three possible solutions to the upper time allocation problem.

In the first case MRT_m equals MRS. Since mathematical optimization of the problem follows Kuhn-Tucker conditions, H_{mSNt} is greater than or equal

zero. At the same time MRT_f is greater than MRS. Thus, H_{fSNt} has to be zero.

In the second case MRT_f equals MRS and MRT_m is less than MRS, meaning that H_{fSMt} is greater than or equal zero and H_{mSNt} has to be zero, respectively. In both cases MRT_m is less than MRT_f, which implies that there is wage discrimination against women and δ is greater than zero.

The third case abstracts from discrimination. Correspondingly, MRT_m equals MRT_f, both marginal rates of transformation equal the marginal rate of substitution. H_{mSNt} and H_{fSMt} are greater than or equal zero. In this case the household is indiff erent about the spouses' intra-sectoral time allocation.

3. Results

The three possible solutions of the time allocation problem are summarized in table (1).

Table 1: Solutions of the time allocation problem.

arg max (Case 1, Case 2, Case 3)				
Case 1	$0 < \delta < 1$	$MRS < MRT_f$	$H_{mSNt} > 0$	$H_{fSMt} = 0$
Case 2	$0 < \delta < 1$	$MRT_m < MRS$	$H_{mSNt} = 0$	$H_{fSMt} > 0$
Case 3	$\delta = 0$	$MRT_m = MRT_f$	$H_{mSNt} \geq 0$	$H_{fSMt} \geq 0$

Every case has its own interpretation, which covers economic theory as well as data observation. The first and second cases are corner solutions. In both cases MRT_m is less than MRT_f, which is due to statistical discrimination. For interpretation it is feasible that δ is relatively high in the first case compared to the second case. Then, it is less attractive to substitute market

with non-market services and both spouses devote time to home production.[9]

Compared to that, substitution is more attractive in the second case. However, there is still some wage discrimination and the household is better off, if the representative male devotes his full productive time to market activities. Subsequently, the female is the only spouse who is in charge of home production. She is additionally employed in the market, what displays the typical female double burden of waged work and household responsibilities. In theory, the marginal rate of substitution is higher than in the upper case, meaning that a fraction of those household responsibilities are compensated by market services. This is possible, because the typical home produced services like child care, cooking or cleaning are also provided by market services. By demanding market services instead of home production the household can achieve a higher level of utility, if both kinds of services are highly substitutable.

The last case deals with the idea of no discrimination in the labor market, with an interior solution and welfare theorem 1 applies. In this case, both spouses are free to allocate their time between service sector and home production. For example, increasing income taxes would reduce the incentive to work in the market sector, but would not change the relative time allocated between male and female in equation (24).

In all cases increasing productivity in market services relative to home production leads to a higher labor supply in the service sector. Nevertheless, an increase of female labor force participation can only be explained in cases 2 and 3, because in case 1 the value of δ is very high and women do not work at all. The lower the value of δ, it is more likely women will enter the labor market, because productivity gains in market services compared to home production pay off.[10] This indicates that a reduction of statistical discrimination of women is an additional approach to explain the rise of female employment.

Next to discrimination there is another force, which distorts relative productivity between market and non-market services and thus the household's time allocation. Remember that income from market labor is taxed but not home production and the gender-specific marginal rates of

[9] In both cases $MRT_m \leq MRT_f$ applies, but in the first case applies $MRS = MRT_m$ and in the second case applies $MRS = MRT_f$. Examining equation (23) parameter δ should be higher in case 1, so that all equations are satisfied.

[10] Again, this is possible if market and home produced services can be easily substituted.

transformation are tax-distorted. Regarding equation (24), the higher labor in the market sector is taxed, the lower relative productivity between market and non-market services becomes. Following this mechanism, the incentive to work in the service sector declines, because $H_{mSMt} + (1-\delta)H_{fSMt}$ decreases.[11]

In the first case, only male labor force participation decreases with rising taxes, because H_{fSMt} is zero anyway. On the other hand, both spouses will spend more time in home production to keep a certain utility level. In case 2 a higher tax rate augments the effect of female wage discrimination and women will be even less likely to work in the labor market. In other words, wage discrimination of women appears like an additional tax on female employment compared to male employment. In case 3, there is lack of discrimination meaning that a higher income tax affects both spouses equally. Only in this last case, time allocation of men and women are not influenced by economic distortions and is then a matter of individual preferences of the household's members.

Conclusion

This paper focuses on how growth in the service sector is positively related to female labor force participation. Generally, industrialized countries underwent structural changes which are characterized by an increasing service sector as well as increasing employment, especially among the female population. Along the way, most women are employed in the service sector. Despite this progress, female employment is in an inferior position to male employment. In the context of structural transition this paper highlights how statistical discrimination of women in the labor market has a depleting effect on female labor supply.

A growth model is constructed which accounts for the increase in female labor supply through structural change. The driving forces here are the growing service sector alongside with increasing differences in productivity among services produced in the market and produced at home (non-market services). If non-market services like cooking, cleaning and childcare can be substituted by market services, relatively high productivity gains in the service sector compared to home production lead to shift of female labor force from household activities to the labor market. In order to analyze if there are forces which limit or enhance the effect of structural change, the

[11] Substitution parameter η is defined as $0 < \eta < 1$. Hence $1/(\eta - 1)$ is negative and productivity relations shift.

model is extended by statistical discrimination in female wages, income taxation of labor, and the release of home production to both spouses.

This extended model is helpful to understand how statistical discrimination of women affects labor supply. Because of statistical discrimination women are assumed to be less productive in labor and thus less compensated for work than their male counterparts. Household activities are not affected by gender-specific expectations towards productivity differences. On that account, statistical discrimination distorts relative productivity between service sector and home production technology, which again influences the labor supply decision of the whole household. The more women are discriminated in the labor market, the more likely the house-hold allocates the female's time into household activities and the male's time to the labor market. Vice versa diminishing statistical discrimination against women in the labor market can also explain a fraction of rising female employment.

Statistical discrimination of women in the labor market makes it difficult for both spouses to leave the classical role of men and women concerning labor and home production, because productivity gains in market services are overcompensated by the gender wage gap. If discrimination persists but does not exceed a level at which women solely devote their time to home production, the typical female double burden of work in the labor market and in household activities arises. Indeed a fraction of those household activities can be substituted by market services without significant losses towards the household's utility, but in the model all markets are assumed to be perfect. For example, costs of asymmetric information might reduce substitution possibilities between non-market with market service and thus decreases productivity gains in market services.

My further research will concentrate on calibrating the model with data of the German labor market. Especially after reunification, one can observe differences in structural transition, wage discrimination and female labor force supply between East and West Germany, what might support the qualitative results of my model. In addition, quantitative results of the model are expected to facilitate measurement of home production productivity and elasticity of substitution between market and non-market services.

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DOES HAPPINESS AFFECT ATTITUDE TOWARDS AMBIGUITY? : AN EXPERIMENTAL APPROACH TO DISTINGUISH BETWEEN SUBJECTIVE PRIOR AND ACT UNDER AMBIGUITY

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Abstract

In the choice experiments under ambiguous information, there is no consensus about how to create ambiguous information. This paper shows that the way ambiguous information is given to subjects affects the decision making of them. In order to measure the degree of pessimism or optimism about ungiven probabilities, I create randomness with subject interactions through transparent procedure. By using this methodology, I found that individuals who held pessimistic prior invest less into ambiguous securities. In addition, I found that the happiness of an individual affects their decision making of investment into ambiguous securities.

Key words : Ambiguity aversion, SEU, MEU, α-MEU, Experimental economics

JEL Classification : D89, C91, G02

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Introduction

This paper attempts to make clear the effect of happiness on decision making with ambiguous information. To do so, firstly I observe how happiness affects the distribution of subjective probabilities. Secondly, I ask subjects to select a sure amount of money or an ambiguous lottery. Possible future outcomes not given probabilities are called ambiguous situations. There are different models that explain individual decision making in ambiguous situations. The most famous models are Maxmin model, alpha-Maxmin model and smooth ambiguity model. Experimental studies attempt to make clear which model gives the best description of observed selection. Most previous studies reveal the subjects preferences for ambiguity without emphasizing the method used to create ambiguous information. Subjects are simply told "probabilities for outcomes are unknown". The two representative studies by Bossaerts et al. and Ahn et al. (2010) that study portfolio selection between ambiguous securities and risky securities in the context of Ellesberg paradox apply this simple instruction. Contrast to these studies, in Carbone, Dong and Hey（2016), subjects guess the approximate probabilities of three states of outcomes made by three colors using Bingo Juggler. Hayashi and Wada (2010) is the first study to test which theory is the best description of how individuals make their subjective probabilities under ambiguity by giving imprecise information. This study uses dice to generate imprecise information. Presently, there is no standard procedures to create ambiguous information. In the case that the methodology of giving ambiguous information is not transparent to the subjects, the relationships between subjects and experimenter may affect the subjects' priors. For example, suppose an experimenter tells the subjects "the probabilities are randomized by computer program", this can be manipulated by experimenter. Because subjects may suspect the experimenter wants to avoid paying out larger rewards, the subjects may show stronger ambiguous aversion.

In the experiments by Bossaerts et al. (2010) and Ahn et al. (2010), subjects are given three Allow securities in the context of Ellsberg Paradox; the probability of one security is known to be one third (1/3) and the probabilities of the other securities are not given, while the sum of the probabilities of these two securities is known to be the remaining two thirds (2/3). Therefore, subjects know neither the dense function of probability nor distribution of probabilities of each ambiguous security. Theoretically, in this case subjects could imagine any distribution of probabilities; uniform distribution, normal distribution, Gaussian distribution, Poisson distribution. In addition to these distribution, a distribution could have two bump. In the latter case, subjects would have more difficulty to guess probabilities than when distribution of probabilities has only one bump.

Based on the above points, this study proposes a novel methodology to produce ambiguous securities through a transparent procedure using human randomness. The experimenter places five subjects in a group. Each group member sets the security probability of another randomly selected group member. Until the end of the experiment, the correspondence between members is unknown. Each subject now confronts the unknown distribution of their security probability, selects a distribution of probability, and predicts one probability to decide a corresponding security for each member. The subjects can not know the distribution of probabilities but can guess to some extent. This procedure makes it possible to measure the degree of pessimistic or optimistic feelings when subjects are given ambiguous securities and provide subjective distribution of probabilities.

Usually the model to describe behaviors under ambiguity is entangled with observation of selected securities and it is impossible to disentangle the priors and acts in experiments. My study disentangles priors and acts. Whether a subject is pessimistic or optimistic is independent of their bet on ambiguous securities can be observed.

This study investigates whether happy feelings directly or indirectly affect attitudes toward ambiguous securities. Happy feelings can first affect optimism or pessimism of distribution of probabilities of ambiguous securities and then these subjective priors can affect decision making toward ambiguity. To make the association I set the experimental procedure which observes whether subjects are pessimistic or optimistic beside their bet on ambiguous securities.

1. Literature Review

There are several prominent previous studies to test which model can explain decision making under ambiguity. Ahn et al. (2010) tested models among maxmin expected utility (MEU), coquet expected utility (CEU), recursive expected utility (REU) model using Ellsberg paradox context; the subjects made their portfolio choice between one risky security and two ambiguous securities. In these studies, the probability of the wining state of a risky security is set to be one third and the sum of the probabilities of the wining states of ambiguous securities is two third. Especially, in Ahn et al. (2010), subjects made fifty choices under various budget constraints. However, it is not clear how the ambiguity is created. Bossaerts et al. (2010) uses the same settings and by observing the ratio of demand of risky securities per ambiguous securities. This study concludes that individuals' beliefs are not reflected in the ambiguous securities because some of investors do not have ambiguous security at all. This study found that some of subjects behaviors are explained by α max-min utility model rather than smooth ambiguity model by Klibanoff (2005) because they held their portfolio so as to keep constant the ratio of ambiguous securities per risky security. In contrast, Carbone, Dong and Hey（2016） create ambiguous securities with three states objectively using Bingo Juggler, so that the ambiguity is similar to error from true probability. They found that α―MEU explain observed behavior better than MV theory, and the behaviors of half of subjects are better explained by SEU. From the results of previous studies taken together, it seems that the individual's behaviors are

explained by SEU model and α- MEU when we take heterogeneity of individuals into account.

The purpose of this study is different from these previous studies. This study focuses on the relationship between happiness and decision making under ambiguity because it is possible that happiness affects priors in view of behavioral economics. Arkes et al. (1988) is the only previous experimental study focusing on happiness and risk preference. This study reports that the half of subjects who were given candies inside a precious box gained a positive mood and evaluate risky lotteries higher and purchased insurances more than the other subjects who were not given candy. However, this results can be occurred by income effect of candy box. Therefore, in this paper, happiness is measured by survey.

2. The experiment

The suggested models for ambiguity in the previous studies are different between experiments. Not only the settings but procedures of experiments are possible to affect ambiguous preferences. When subjects are not informed how the ambiguous box are made, they can possibly suspect that the experimenter could manipulate the probability that the subjects are rewarded. Furthermore, in the case that subjects are told “probability is made by random function”, the more random numbers are created, the closer the distribution of randomized numbers became uniform distribution. From this viewpoint, this study create ambiguous securities thought a transparent and replicable procedure. Specific procedure of this experiment enables the experimenter to elicit pessimistic or optimistic priors when each subject makes a decision.

One hypothesis of this study is that the predictions of distribution of probabilities are affected by degree of happiness. The similar idea is shown by Epstein and Schneider (2008). They suppose that individuals become pessimistic when they

receive ambiguous news in the market, such as when the variations of ambiguous securities are not given one value but given with some range. Even though this supposition has a crucial role in the conclusion of their study, there is no proof of this supposition. This study do not suppose all individuals have pessimistic priors under ambiguous information. Rather, I investigate a hypothesis that the degrees of pessimistic or optimistic priors are affected by individuals' degrees of happiness.

3. Procedure

Basic procedure is as below.

In the first stage, the subjects are asked to split 20 balls into green or yellow as they wish under some constraints. Subjects do not know the purposes for these questions.

Q1. Please enter 20 balls comprising of green or yellow as you like into box A.

How many green balls do you want to enter ?

➞ I enter [ ] green balls.

Q2. There are 5 green balls inside the box. Please enter another 15 balls comprising of green or yellow.

How many green balls do you want to enter?

➞ I enter [ ] green balls.

Q3. There are 10 balls inside the box of either color. Please enter another 10 balls comprising of green or yellow.

How many green balls do you want to enter?

➞ I enter [ ] green balls.

In the second stage, the experimenter makes groups comprising five subjects at random. This procedure is done in front of subjects. The papers subjects' numbers are written and sealed. All sealed papers are mingled and each five papers are selected to make one group. Neither experimenter nor subjects know who the members of their respective groups are until the end of the experiment.

In the third stage, the subjects are told that one member in their respective groups has been selected and the number they wrote down in the first stage has been randomly selected for betting. The subjects are told that a "ball will be drawn from the box chosen in the previous step and that they should state whether they prefer to bet or to receive a sure income of X dollars. X varies from 100 yen (approximately 80 dollars when 1 dollars values 120 yen) to 1000 yen to know certainty equivalent (CE) value of the ambiguous box. If a yellow ball is drawn from their box, subjects acquire 2000 and if a green ball is drawn, they acquire nothing.

Two ambiguous boxes corresponding to each subject are made in the end of experiment. The procedure to decide rewards took at least five minutes per person.

4. The measurement of happiness level

In an experimental environment it is very difficult to create happy or unhappy feelings. Although it is possible to give subjects feelings of fear or humor by some vertical experiment, these are temporal movement of feelings and different from sustained happiness or unhappiness. In addition, the methodology to give subjects long lasting unhappy feelings is ethically problematic. Therefore, I measured the subjects happy and unhappy feelings at that time they participated in the

experiment by self-report. All subjects are students of Keio University and using this constraint I selected topics which are important to students.

The academic definition of subjective well-being by phycologists is "the emotional and cognitive evaluations of life". This evaluation asks subjects how satisfied they are with their life events such as marriage, professions they engage in, and enrichment of all of life since birth. (Diener, Oishi and Lucus (2003).)

Based on the above definition, I asked subjects their level of happiness with regard to their (1) Familial Relationships (2) Academic studies (3) Relationship with their boyfriend or girlfriend (4) Monetary Situation (5) Relationship with Friends (6) Activities such as volunteering and hobbies (7) Total happiness. A scale of seven answers are listed. 1. Very happy / satisfied 2. Happy / Satisfied 3. Somewhat happy / satisfied 4. Normal 5. Somewhat unhappy / unsatisfied 6. Unhappy /Unsatisfied 7. Very unhappy / unsatisfied.

Subjects were asked to fill out the survey before the reward amount is decided. When the subjects answered the entire questionnaire, they were rewarded 1000 yen. These contents are private information, therefore, I carefully explained that their the data would anonymized using a subject number and I received a consent form from the subjects.

5．The distribution of dependent variable and independent variables

5-1．The difference of certainty equivalence (CE) between boxes

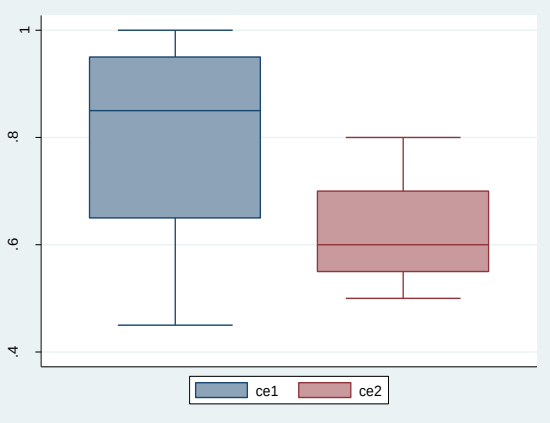

Figure 1 CE of Box A and Box B

(note1) The numbers of the vertical axis are CE/1000

(note2) CE2 shows the CE for box B, and CE3 shows the CE for box C, CE4 shows the CE for box D.

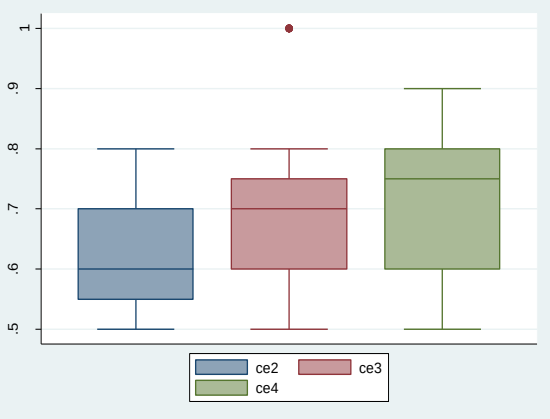

Figure 2 CE of BoxB, Box C and Box D.

(note1) The numbers of the vertical axis are CE/1000

(note2) CE2 shows the CE for box B, and CE3 shows the CE for box C, CE4 shows the CE for box D.

【Box B vs. Box A】 By Wilcoxson **rank sum test,** Box B is significantly larger than Box C (**z =4.51**). Because Box A is risky box. the evaluation of Risk has larger variation than ambiguity.

CE of B is expressed by this equation,

$$\mathrm{CE(B)} = \left\{w_0 \frac{0}{20} + w_1 \frac{1}{20} + \cdots + w_{20} \frac{20}{20}\right\} \mathrm{u(2000yen)}$$

If subjects apply uniform distribution of green balls in Box B, $w_0 = w_1 = \cdots . = w_{20} = \overline{w}$, Therefore, $\mathrm{CE}(B) = 21\overline{w} * u(2000) = \frac{1}{2}u(2000)$ = CE(A)

In the case that possible subjective probabilities of green balls in Box B have a unique focal point with a symmetric distribution,

$$\mathrm{CE(B)} = \left\{w_0 \frac{0}{20} + w_1 \frac{1}{20} + \cdots w_{10} \frac{10}{20} + \cdots w_{19} \frac{19}{20} + w_{20} \frac{20}{20}\right\} \mathrm{u(2000yen)}$$

Assuming that $w_{20-x} = w_{0+x}$,

$$\mathrm{CE(B)} = \{\frac{1}{2} w_{10} + w_{11} + \cdots + w_{20}\} \mathrm{u(2000)} \qquad = \left\{w_{10} \frac{10}{20}\right\} \mathrm{u(2000yen)} = \frac{1}{2}u(2000)$$

,

In both cases, CE (B) is considered to be equivalent to CE(A).

If a subject holds asymmetric distribution, and they are pessimistic, the CE of Box B is low as observed. In the experiment, 20 subjects out of 49 were CE(A) = CE(B). Twelve subjects were risk neutral.

【Box B vs. Box C】 By Wilcoxson **rank sum test,** Box B is significantly larger than Box C (z=2.685). This is surprising result when it is considered that Box C already contains five green balls that bring a losing state. This result comes from the ambiguity averse because Box B' s ambiguity is larger than Box C.

【Box B vs. Box D】 The CE of Box D is significantly larger than Box B (z =4.51). The significant difference between these Boxes comes from the size of ambiguity because, Box D contains at least one green ball and average of green balls of box D is 5.5 because the number of green ball is decided by uniform distribution.

【Box C vs. Box D】 Even though the ambiguity of Box D is smaller than Box C, the difference between Box C and Box D is not significant. The fact that CE of Box D has a larger range reflects that Box D is mixed box of risk (Box A) and ambiguity (Box B)

5-2 . The distribution of priors of green balls

In this subsection, I show the actual distribution of priors of green balls and the degree of pessimism for each box.

In the first stage of this experiment, subjects wrote down the number of green balls without being informed of the purpose. In the second stage, subjects are informed how the numbers are utilized. The experimenter makes groups comprised of five subjects chosen randomly in front of the subjects. Subjects are informed that another member of their group has been selected to determine their security probability. Subjects are asked to predict all five member's numbers and asked to mark a circle for their own number and mark triangle for the number who decide restrictive balls.

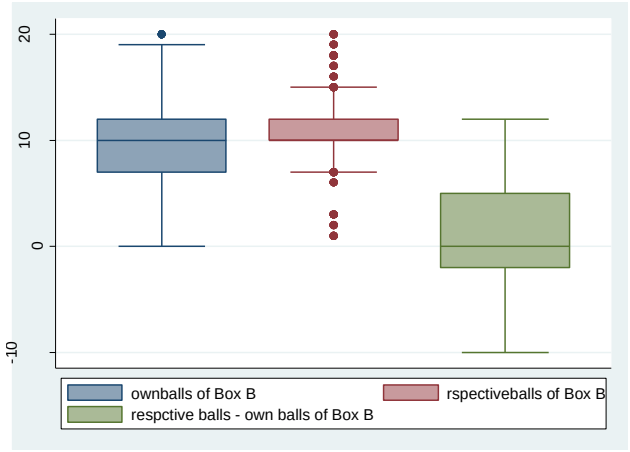

Figure 3 The degree of pessimism of Box B

(note) The blue bar shows the number of green ball a subject wrote down in the first stage. The red bar shows the predicted number of green balls chosen for them. The green bar shows the degree of pessimism

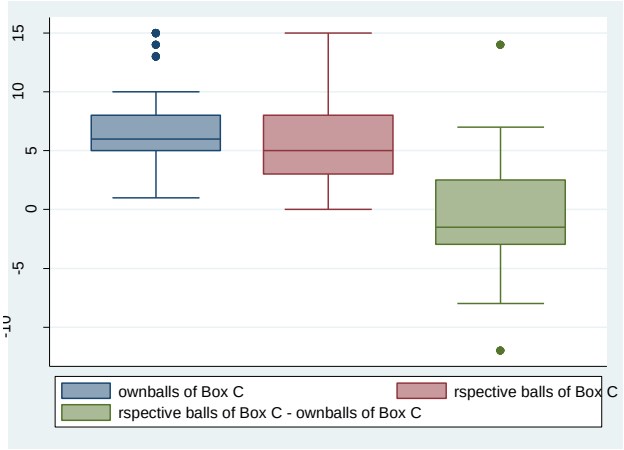

Figure 4 The degree of pessimism of Box B

(note) The blue bar shows the number of green ball a subject wrote down in the first stage. The red bar shows the predicted number of green balls chosen for them. The green bar shows the degree of pessimism

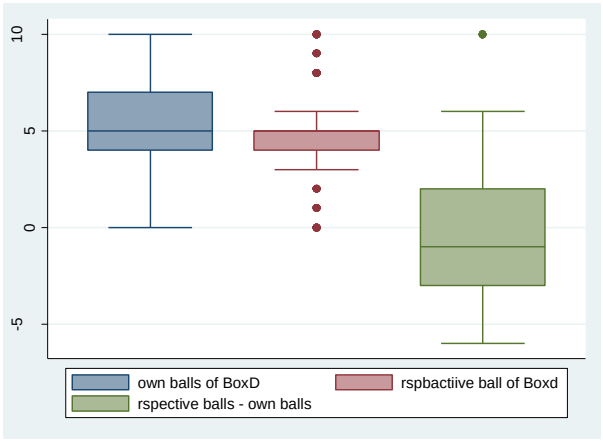

Figure 5 The degree of pessimism of Box D

(note) The blue bar shows the number of green ball a subject wrote down in the first stage. The red bar shows the predicted number of green balls chosen for them. The green bar shows the degree of pessimism

6．Empirical Analysis

6-1．Models

To explain CEs for each box, consider the models below

1) Model 1: The demand of ambiguous box is decided by happiness indirectly though pessimistic / optimistic prior.

In this model, demand of B.(C,D) is dependent of degree of pessimism / optimism

for prior of green balls. Demand is expressed by CE of each box (lottery) and/or the each bet for a box. The pessimism / optimism for prior of green balls is the decided degree of happiness.

CE of ambiguous Box = const. + a_1 (degree of risk averse)

+ a_2 (degree of pessimism)

The degree of pessimism = const. ＋ b_1（happiness of familial）

+ b_2（happiness of love）

+ b_3（happiness of friendships）

+ b_4（happiness of monetary situation)

+ b_5（happiness of studies ）

2) Model 2-1: The demand of ambiguous Box is decided depending on the degree of risk aversion and /or ambiguity aversion

In this model, the risk aversion is measured by demand for Risky Box A

The ambiguity aversion is measured by relative demand for Ambiguous Box B per se Risky Box A

CE of box B = const. + a_1 (degree of risk aversion)

+ b_1（happiness of familial）

+ b_2（happiness of love）

+ b_3（happiness of friendships）

+ b_4（happiness of monetary situation）

+ b_5（happiness of studies ）

CE of Box C, D ＝ const. ＋ a_1 (ambiguity preference)

＋ b_1（happiness of familial）

＋ b_2 （happiness of love）

＋ b_3 （happiness of friendships）

＋ b_4 （happiness of monetary situation)

＋ b_5 （happiness of studies ）

3) Model 2-2 : The bet on Box is explained by both risk preferences or ambiguity preference degree of happiness.

In this model, the risk aversion is measured by demand for Risky Box A. The ambiguity aversion is measured by relative demand for Ambiguous Box B per se Risky Box A

Bet on box B **=** const. **+** a_1 (degree of risk aversion)

＋ b_1（happiness of familial）

＋ b_2 （happiness of love）

＋ b_3 （happiness of friendships）

＋ b_4 （happiness of monetary situation)

＋ b_5 （happiness of studies ）

Bet on Box C, D ＝ const. ＋ a_1 (ambiguity preference)

$+ b_1$ （happiness of familial）

$+ b_2$ （happiness of love）

$+ b_3$ （happiness of friendships）

$+ b_4$ （happiness of monetary situation)

$+ b_5$ （happiness of studies ）

【Dependent Variables】

A) In both models CE of each box is measured as below. In the multiple questionnaires to ask subjects whether they bet for a risky/ambiguous box that rewards 2000 yen in its wining state rather than receive a sure x yen (1) , the choice of “bet” will change to “not bet” on the threshold for each subject. The switching point is between x yen to x+100 yen. Therefore, the CE of this box is defined as x + 50 yen. The CE of a subject who selects “bet” for any x is supposed to be 1000 yen, the CE of a subject who selects “not bet” is supposed to be 0 yen.

I standardize the CE to 0 to 1 by divided by 1000 yen,

B) The act of bet for a yellow ball is drawn from each subject’s box is 1 and “not bet ” is 0.

【Independent Variables】

C) To measure the risk degree of aversion of subjects, I applied Coefficient of Rational Risk Aversion. The calculation of CRRA is measured by application of cumulative utility $u(c) = \frac{c^{1-\gamma}}{1-\gamma}$. The calculation of Coefficient of Absolute Risk Aversion is calculated by application of $u(c) = -\frac{1}{\alpha}e^{-\alpha c}$ I I selected γ as a proxy because explanation power was stronger than CARA.

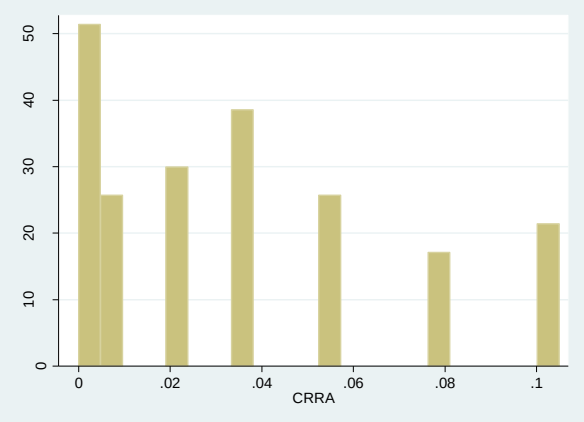

Fig. 23 The distribution of CRRA measured by Risky Box A

7．The results of empirical analysis

7-1．CE explained by degree of pessimistic feelings

7-1-1．Estimated by Ordinary Least Square

By using OLS, it is investigated whether the differences of CE of B, C and D between subjects are explained by degree of pessimism for each box. The null hypothesis that distribution of pessimistic degrees were heterogeneous

dispersion is not rejected, therefore, the result after revised heterogeneous dispersion. In addition, I tested the result using Generalized Least Squared

Estimation. Pessimistic Degree explains CE of all Boxes significantly when GLS is used.

	OLS			OLS robust		
Dependent variables	CE of Box B	CE of Box C	CE of Box D	CE of Box B	CE of Box C	CE of Box D
Constant (t-value) [P>|t|]t	0.5232 (137.08***) [0.000]	0.6045 (36.87***) [0.000]	0.6320 (30.04***) [0.000]	0.5253 (73.04***) [0.000]	0.6045 (36.69***) [0.000]	0.6320 (28.66***) [0.000]
Degree of pessimism	-0.003144 (-0.63) [0.535]	-0.06207 (-1.65) [0.107]	0.0113 (0.35) [0.728] -	-0.003144 (-0.62) [0.538]	-0.0620 (-1.60) [0.117]	0.0113 (0.37) [0.713]
CRRA	2.8902 (37.04***) [0.000]	2.1895 (6.50***) [0.000]	1.8783 (4.35***) [0.000]	2.9087 (31.62***) [0.000]	2.1895 (6.21***) [0.000]	1.8783 (4.35***) [0.000]
F-value (Prob. > F)	F(2,46)= 660.04 (0.0000)	F(2,46)= 21.59 (0 .0003)	F(2,46) = 9.85 (0.0003)	F(2,44) = 500.96 (0.0000)	F(2,46)= 19.34 (0.0000)	F(2,46)= 10.00 (0.0002)
R^2 Adjusted R^2	0.9677 0.966	0.4832 0.4607	0.3001 0.2697	0.9677	0.4832	0.3001

Root MSE	0.01841	0.0788	0.1011	0.01865	0.07881	0.10112

Table 1 Certainty Equivalent Value of Ambiguous Box and Degree of Pessimistic

(note1) the degree of pessimism = (the number of green balls chosen for a subjects – the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

The squared residuals of the model of Box B with CRRA was explained 97 %. The subjects may have distributions of possible green balls in their box possibly similar to uniform distribution, therefore, the CE of B could explained by risk preferences enough.

GLS Robustness analysis	CE of Box B (t value) [P>|t|]	CE of BoxC (t-value) [P>|t|]	CE of Box D (t-value) [P>|t|]
Constant	0.5232 (447.40) [0.000]	0.6059731 (115.75***) [0.000]	0.6284632 (97.84***) [0.000]
Degree of pessimism	-0.007822 (-2.30**) [0.022]	-0.05856 （ -4.85*** ） [0.000]	-0.02653 (-1.92*) [0.055]
CRRA	2.890254 (120.88***) [0.000]	2.167632 (20.47***) [0.000]	1.8551 (14.32***) [0.000]
Wald chi2(2)	14612.21 Prob > chi2 = 0.0000	420.89 Prob > chi2 = 0.0000	216.63 Prob> chi2 = 0.0000
Log likelihood	1277.685	1162.073	431.4513

Table 2 the measurement of CE by degree of pessimism and degree of risk aversion

(note1) the degree of pessimism = (the number of green balls chosen for a subjects

– the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

The CE of Box C and Box D were more weakly explained by risk preferences than Box B. It is possible that the prediction of distribution of green balls of box C was more complicated because of multiple focal points, therefore, subject did not apply uniform distributions. CE of Box C could be explained better by ambiguity aversion. Because the focal point of priors of Box D was only five, subjects could

have priors similar to Box B, however, the CE of Box D was significantly explained by its pessimistic degree.

3-1-2. Logit Analysis and Probit Analysis

For each Box, I asked subjects whether they bet for a yellow ball (wining state ball) or receive a certain amount of money. We can consider that these are discrete "two-value problems". It is assumed that each subject decide "bet or not bet" for every questionnaire dependently, using logit model and probit model, we can observe casual relationships between decision making and subjective probability distribution, and happy feelings.

I made panel data for each subject × each lotteries (10 lotteries)

10 lotteries are x yen versus bet for ambiguous Box. In all models using logit and probit analysis, CRRA was 1 % significant. These results also shows that the more risk averse, the less evaluation of ambiguous box were low. Degree of pessimistic were not significant for Box D.

		Panel logit			Panel probit		
		Bet on Box B z-value P>|z|	Bet on Box C z-value P>|z|	Bet on Box D z-value P>|z|	Bet on Box B z-value P>|z|	Bet on Box C z-value P>|z|	Bet on Box D z-value P>|z|
Fixed Effect Part	Constant	-2.048474 (-3.46**) [0.001]	-2.6734 (-3.19**) [0.001]	-2.216 (-2.49**) [0.013]	-1.1450 (-3.47**) [0.001]	-1.4218 (-3.20**) [0.001]	-1.2146 (-2.48**) [0.013]
	Degree of Pessimism	-1.123946 (-2.09**) [0.036]	-0.9867 (-2.03**) [0.043]	-0.423 (-0.98) [0.327]	-0.6831 (-2.27***) [0.023]	-0.6073 (-2.17**) [0.030]	-0.2495 (-0.99) [0.321]
	CRRA	37.651 (8.42***) [0.000]	39.525 (7.42***) [0.000]	33.078 (6.75***) [0.000]	21.842 (8.86***) [0.000]	21.427 (7.79***) [0.000]	18.518 (7.10***) [0.000]
Wald χ^2		72.10	55.30	47.53	79.69	60.79	47.53
Log Likelihood		-215.81	-180.329	-183.829	-216.055	-182.074	183.829
Prob. >χ^2		0.000	0.000	0.000	0.000	0.000	0.000
Random Effect Part	$\ln(\sigma^2)$ $\sigma_u = \sqrt{\hat{\psi}}$ P	1.092 1.727 0.4754	1.797 2.456 0.6470	1.938 2.636 0.6786	0.482 0.978 0.489	0.554 1.319 0.6351	0.757 1.460 0.6808
	Likelihood-ratio test of ρ=0 $\overline{\chi^2} = 0$ Prob. >$\overline{\chi^2}$	151.74 0.000	228.55 0.000	220.04 0.000	150.79 0.000	224.72 0.000	219.08 0.000

Table 1 The Logit/Probit models of Bets on ambiguous boxes with degree of pessimism and degree of risk aversion

(note1) the degree of pessimism = (the number of green balls chosen for a subjects

– the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

In the case that risk preferences are removed from the estimation of equations, only the pessimistic feeling mattered in Box B and Box D but did not matter in Box C. It is difficult to understand the reason why this occurred, however these results are consistent with the observation of the act similarly in Box B and D. The proxy of distribution of ambiguous Box explained significantly the CE of B and D. In addition, the ambiguity preferences are significantly important.

		Panel probit		Panel logit	
		Bet on Box C z 値 P>|z|	Box D z 値 P>|z|	Box C z 値 P>|z|	Box D z 値 P>|z|
Dependent Variables	Constant	-0.03517 (-0.17) [0.863]	0.03417 (0.07) [0.941]	-0.1955 (-0.55) [0.585]	0.006311 (0.01) [0.994]
	Degree of pessimism	-0.02468 (-2.02**) [0.043]	-0.0390 (-2.32***) [0.021]	-0.0361 (-1.86*) [0.063]	-0.06695 (-2.59**) [0.010]
	Ambiguity preferences $\frac{CE\ of\ Box\ B}{CE\ of\ box\ A}$	-0.6326 (-2.24**) [0.025]	-0.6297 (-3.72***) [0.000]	-0.9742 (-2.02**) [0.044]	-1.0708 (-3.88***) [0.000]
Wald χ^2		5.74	39.39	4.43	42.21
Log （Pesedo） Likelihood		-218.06	-205.86	-218.30	-205.96
Prob. >χ^2		0.0566	0.000	0.1091	0.000
$\ln(\sigma^2)$ $\sigma_u = \sqrt{\hat{\psi}}$ ρ		0.1774 1.0928 0.54424	0.3743 1.2058 0.5925	1.3145 1.9300 0.5310	1.5240 2.1426 0.5825

Table 4 Panel Data Logit and Probit Analysis of bets on ambiguous box

3-2-1 Pessimistic prior and degree of happiness

From the result of Table 5, one of my hypothesis that there is a casual relationship between pessimistic prior and degree of happiness. In Table 5, risk neutral dummy is added.

	Panel Logit			Panel Probit		
Independent Variables (t-value) [P>|t|]	Degree of Pessimism Box B	Degree of Pessimism Box C	Degree of Pessimism Box D	Degree of Pessimism Box B	Degree of Pessimism Box C	Degree of Pessimism Box D
Constant	-2.502876 (-0.92) [0.362]	-2.544877 (-0.99) [0.327]	0.1868 (0.68) [0.501]	-3.3343 (-1.22) [0.231]	-2.9662 (-1.14) [0.261]	0.08944 (0.33) [0.740]
Familial （unhappiness）	-1.0029 （-1.88*） [0.067]	0.4149 (0.81) 0.1228	-0.07869 (-1.23) [0.226]	-1.2874 (-2.44**) [0.019]	0.27081 (0.48) [0.632]	-0.1120 (-1.75*) [0.087]
Love （unhappiness）	0.7469 （1.87*） [0.068]	-0.1123 (-0.23) [0.821]	0.07806 (1.69*) [0.098]	0.8554 (2.08**) [0.043]	-0.05736 (-0.11) [0.911]	0.09076 (1.96*) [0.057]
Friendship （unhappiness）	0.6636 （1.45） [0.154]	-0.03621 (-0.08) [0.934]	0.07868 (1.31) [0.196]	1.0406 (2.52**) [0.016]	0.1548 (0.33) [0.746]	0.1228 （ 2.16** ） [0.036]
Monetary situation （unhappiness）	0.7130317 (1.39) [0.172]	0.2888 (0.52) [0.606]	0.07679 (1.64) [0.108]	0.8798 (1.77*) [0.084]	0.3733 (0.70) [0.486]	0.09632 (1.99*) [0.053]
Grades （unhappiness）	-0.09575 (-0.21) [0.833]	0.1063 (0.23) [0.821]	-0.05473 (-1.27) [0.212]	0.01493 (0.03) [0.974]	0.1624 (0.34) [0.737]	-0.04177 (-0.98) [0.333]
Risk Neutral Dummy				-2.6136 (-1.80*) [0.079]	-1.3244 (-0.69) [0.492]	-0.3061 (-1.76*) [0.086]
F value	F(5, 43) = 1.37 Prob. > F = 0.2534	F(5, 43) = 0.51 Prob. > F = 0.7690	F(5, 43) = 2.25 Prob.>F = 0.0667	F(6, 42) = 2.31 Prob. > F = 0.0514	F(6, 42) = 0.71 Prob. > F = 0.6416	F(6, 42) = 3.27 Prob.>F = 0.0099
R^2	0.1197	0.0308	0.1330	0.1598	0.0422	0.1826
Root MSE	4.7454	4.7431	0.4961	4.6907	4.771	0.4874

Table 2 The degree of pessimism explained by happiness Indicators

(note1) the degree of pessimism = (the number of green balls chosen for a subjects – the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

As for the risk neutral subjects, the demand for Box B and Box D were significantly explained by pessimistic degrees for each box, and subjects who feel happy about familial things were not pessimistic for the priors. Those who feel unhappy with lovers and friends were pessimistic for ambiguous Box B and D. There is a possibility happiness about friendship leads to trust with friends and making them not pessimistic. However, the predicted pessimistic degree did not explain the CE of box B and Box D.

Furthermore, Box C was not explained by any degree of happiness.
With these results integrated, the hypothesis that the pessimistic degree is causally affected by happy feelings is not strongly supported.

7-3．Direct relationship: CE of ambiguous Boxes and happiness

7-3-1．CE of All Box is explained happiness and risk / ambiguity preference

	OLS robust			
Dependent Variables	CE of Box A (t-value) [P>|t|]	CE of Box B (t-value) [P>|t|]	CE of Box C (t-value) [P>|t|]	CE of Box D (t-value) [P>|t|]
constant	0.5963 (6.89***) [0.000]	0.7339 (16.40***) [0.000]	0.7802 (16.39***) [0.000]	0.9156 (19.46***) [0.000]
Familial relationship （unhappiness）	-0.02607 (-0.93) [0.359]	0.01594 (1.05) [0.299]	-0.0032103 (-0.22) ［0.831］	0.004226 (0.26) [0.796]
Love （unhappiness）	0.002827 (0.15) [0.878]	-0.002464 (-0.25) [0.806]	-0.005395 (-0.45) ［0.658］	-0.002 (-0.17) [0.867]
Friendship （unhappiness）	0.04955 (2.65**) [0.011]	-0.02827 (-2.70*) [0.010]	-0.03185 (-3.18**) [0.003]	-0.04290 (-4.55***) [0.000]
Monetary situation （unhappiness）	0.02018 (1.04) [0.302]	-0.01173 (-1.14) [0.260]	-0.009546 (-0.91) [0.366]	-0.018549 (-1.51) [0.138]
Grades (unhappiness）	0.01913 (1.04) [0.303]	-0.01068 (-1.10) [0.278]	0.006593 (0.61) [0.548]	-0.01683 (-1.87*) [0.069]
Sex Dummy (Female＝ 1 Male＝0)	-0.005768 (-0.10) [0.920]	0.005024 (0.17) [0.867]	0.002114 (0.07) [0.947]	0.0003172 (0.01) [0.992]
F-value	F(6,42)= 2.26 Prob.>F = 0.0557	F(6,42)= 2.49 Prob. > F = 0.0377	F(6, 42) = 2.81 Prob.>F = 0.0216	F(6, 42) = 6.06 Prob.> F = 0.0001
R^2	0.1712	0.1940	0.1892	0.3406
Root MSE	0.18035	0.09603	0.1033	0.10272

Table 3 The certainty equivalent values of Boxes and degree of happiness

(note1) the degree of pessimism = (the number of green balls chosen for a subjects

– the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

Table 6 shows the results of testing whether CE for all boxes are explained by happy feelings directly using OLS. The degrees of happiness start at 1 (very happy) and go to 7 (very unhappy). The degree of happiness becomes larger as subjects feel unhappy. The sign of coefficients becomes negative if happy individuals evaluate Box higher. I asked the subjects about their happiness in their hobbies and recruitment activity and their human relationship outside family, boyfriend, girlfriend, and friends. These happiness indicators are not significant in any models.

It is very interesting that the result of Box A cannot be explained by any happiness. CE of Box B, C, D was significantly higher for those who feel happier with friends. As for CE of Box D, the satisfaction of study (grades) feel more demand for Box D because Box D is mixture of box of uniform distribution and ambiguous box. The subjects who evaluate themselves to be cool bet Box D more.

In addition to the above test, CE of Box C and D were significantly explained by relative ambiguity preference made by CE of B divided by CE of A. Those who satisfy monetary situation evaluated Box B with CRRA. These result was not very robust but intuitive.

Dependent Variables	CE of Box B (t 値) [P>|t|]	CE of Box C (t 値) [P>|t|]	CE of Box D (t 値) [P>|t|]
Constant	0.5497 (53.08***) [0.000]	0.89033 (20.80***) [0.000]	0.9976 (20.41***) [0.000]
Familial relationship （unhappiness）	003155 (1.37) [0.180]	-0.01540 (-1.33) [0.192]	-0.004846 (-0.40) [0.690]
Love （unhappiness ）	-0.002613 (-1.36) [0.180]	-0.002548 (-0.31) [0.759]	0.0001194 (0.01) [0.990]
Friendship (unhappiness）	-0.003628 (-1.34) [0.189]	-0.01037 (-1.30) [0.199]	-0.02691 (-3.61**) [0.001]
Monetary situation （unhappiness）	-0.003255 (-1.80*) [0.080]	0.0003763 (0.05) [0.957]	-0.01116 (-1.04) [0.306]
Grades （unhappiness）	-0.001159 (-0.69) [0.494]	0.01476 (1.67) [0.103]	-0.01075 (-1.25) [0.217]
CRRA	2.8146 （ 29.82*** ） [0.000]		
Ambiguity preferences		-0.1496 (-5.55***) [0.000]	-0.1114 (-4.03***) [0.000]
Sex Dummy (Female ＝ 1 Male＝0)	0.001418 (0.31) [0.760]	0.0002874 (-0.01) [0.991]	-0.0014705 （-0.05） [0.959]
F-value	F(7,41) = 174.73 Prob. > F = 0.0000	F(7, 41) = 11.67 Prob. > F = 0.0000	F(7, 41) = 8.47 Prob. > F = 0.0000
R^2	0.9730	0.5731	0.5155
Root MSE	0.0178	0.07587	0.08911

Table 4 The certainty equivalent of ambiguous Boxes explained with degree of happiness and ambiguity preferences

(note1) the degree of pessimism = (the number of green balls chosen for a subjects
– the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.
the ** of t-value shows the independent variable is significant for 5 %
the * of t-value shows the independent variable is significant for 10 %

7-3-2 . The logit and probit analysis of bet for each lottery

When it is supposed that subjects decide whether they bet the ambiguous box that gives a chance to receive 2000 yen when a yellow ball is drawn or not independently every times, the decision making bet or not bet can be described as a logit model or probit model.

Each subject decides to receive a certain amount of money or bet an ambiguous box. Because sure incomes varies from 100 yen to 1000, subjects face ten times decision making.

The bet can be explained by degree of pessimistic and CRRA, and the results are in table 8. The subjects who were satisfied with their friendship and with monetary situation bet more. Although the subjects who satisfied with their study/grade select

		Bet on Box B	Bet on Box C	Bet on Box D	Bet on Box B	Bet on Box C	Bet on Box D
Fixed Effect Part	Const. (z-value) P>|z|	1.3595 (2.09**) [0.037]	0.5495 (0.66) [0.507]	3.2863 (3.17***) [0.002]	1.359 (3.66***) [0.000]	0.5495 (0.82) [0.413]	3.2863 (2.83**) [0.005]
	Familial Relationship	-0.06189 (-0.57) [0.571]	-0.05607 (-0.46) [0.644]	-0.02929 (-0.23) [0.820]	0.06188 (-1.16) [0.245]	-0.05607 (-0.73) [0.468]	-0.02923 (-0.21) [0.836]
	Love	0.07438 (0.89) [0.374]	-0.09443 (-1.01) [0.313]	0.09503 (0.97) [0.332]	0.07439 (1.71*) [0.088]	-0.09443 (-1.20) [0.230]	0.09502 (1.19) [0.235]
	Friend ship	-0.5688 (-4.73***) [0.000]	-0.5524 (-4.36***) [0.000]	-0.8708 (-5.78***) [0.000]	-0.5688 (-4.92***) [0.000]	-0.5524 (-3.35**) [0.001]	-0.8708 (-7.57***) [0.0

							00]
	Monetary Situation	-0.1441 (-1.67) [0.094]	-0.1378 (-1.45) [0.147]	0.3732 (-3.59***) [0.000]	-0.1441 (-1.93**) [0.054]	-0.1378 (-5.82***) [0.000]	-0.3732 (-5.66***) [0.000]
	Studies	-0.1167 (-1.48) [0.139]	0.10318 (1.17) [0.243]	-0.3560 (-3.69***) [0.000]	-0.1167 (-3.24**) [0.001]	0.1032 (3.99***) [0.000]	-0.3556 (-5.08***) [0.000]
Wald χ^2		28.76	26.28	54.05	32.67	104.74	133.91
Log Likelihood		0.70235	-208.019	-189.8328	-247.753	-208.019	-189.8329
Prob. >χ^2		0.000	0.0001	0.0000	0.0000	0.000	0.000
Random Effect Part	$\ln(\sigma^2)$ $\sigma_u = \sqrt{\hat{\psi}}$ P	0.7024 1.4207 0.3802	1.4307 2.0449 0.5597	1.9291 2.6237 0.6766	0.7024 1.4207 0.3802	1.4307 2.0449 0.5597	1.929 12,623 0,6766
	Likelihood ratio test of ρ=0 $\overline{\chi^2} = 0$ Prob. >$\overline{\chi^2}$	 129.28 0.000	 203.08 0.000	 234.69 0.000			

Table 8 The bet on ambiguous Boxes and degree of happiness

(note1) the degree of pessimism = (the number of green balls chosen for a subjects – the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.
the ** of t-value shows the independent variable is significant for 5 %
the * of t-value shows the independent variable is significant for 10 %

Even though we can link the bet to the ambiguous box to happiness, that satisfaction with friendship does affect ambiguous box bet frequency can be interpreted as subjects may have friends in their restrictive groups. To evade this criticism, I show that the bet to the ambiguous box was described by total happiness. Taking all results into consideration, I conclude that the happiness affect the bet on ambiguous securities.

		Panel logit		
		Bet on Box B	Bet on Box C	Bet on Box D
Fixed Effect Part	Content z-value P>|z|	-0.3066 (-0.72) [0.470]	-0.5157 (-0.94) [0.349]	0.3178 (0.37) [0.715]
	Total happiness	-0.1215 (-1.66*) [0.096]	-0.1919 (-3.02**) [0.003]	-0.4537 (-6.31***) [0.000]
Wald χ^2		0.0964	9.12	39.87
Log pseudoikelihood		-265.470	-222.690	-221.75
Prob. >χ^2		0.0964	0.0025	0.0000
$\ln(\sigma^2)$ $\sigma_u = \sqrt{\hat{\psi}}$ ρ		0.54370 1.3124 0.3436	1.2998 1.9153 0.5272	1.6056 2.2318 0.6022

Table 9 The bet on ambiguous Boxes and degree of total happiness

(note1) the degree of pessimism = (the number of green balls chosen for a subjects – the number of green balls) / the range of possible green balls

(note2) the *** of t-value shows the independent variable is significant for 1 %.

the ** of t-value shows the independent variable is significant for 5 %

the * of t-value shows the independent variable is significant for 10 %

Conclusion

In this experiment I used human randomness to create ambiguous securities though a transparent procedure. Then I measured their degree of pessimism / optimism independently of their act. The subject's demand for ambiguous securities was explained by their measured degree of pessimistic feeling.

However, the degree of pessimism was not explained by the degree of happiness. Rather, the demand for ambiguous securities are directly explained by happiness. Specifically the happiness with friendships significantly explained more demand for ambiguous box. The most striking results is the certainty equivalent of ambiguous securities with a unique bump in the distribution of probabilities,

which was mostly explained by risk preferences. However, the ambiguous securities with multiple bumps in the distribution of probabilities are less explained by risk preferences. Therefore, I conclude that the method ambiguous information in an experiment is given to subjects may affect their decision making.

The results show that the more pessimistic subjects evade bets on ambiguous securities. However, the degrees of pessimism do not explain the degree of happiness of subjects with consistency. I cannot conclude that the pessimistic / optimistic degree on priors are not explained by happiness. However, this result shows that the subjects who are satisfied with friendship and monetary situation bet more on ambiguous boxes. As for box B and D, subjects who are satisfied with their studies at school bet more. I could say that happiness does matter in deciding to invest in ambiguous securities through some mechanism.

In this study, firstly I showed that the method used to give ambiguous information does affect the bet on ambiguous box. Secondly, I could define and

measure the pessimistic / optimistic degree independently of their bet on ambiguous securities. Thirdly, I confirm that the degree of happiness of individuals directly affects decision making under ambiguity.

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