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CONTENTS

EDITOR'S INTRODUCTION	i
Simona VINEREAN	
COINTEGRATION OF PROPERTY PRICES IN POLAND	1
Krzysztof DRACHAL	
INVESTMENT UNDER FINANCIAL LIBERALIZATION: POST 1980 TURKEY CASE	5
Onur TUTULMAZ, Burcu DOĞAN	
EFFECT OF FINANCIAL LIBERALIZATION ON THE PROBABILITY OF OCCURRENCE OF BANKING CRISES	14
Ramzi FARHANI, Ghrissi MHAMDI, Abdelkader AGUIR, Mounir SMIDA	
IDENTIFICATION OF KEY PRODUCTIVE SECTORS IN THE MEXICAN ECONOMY	22
David REVILLA, Adelaido GARCÍA-ÁNDRES, Isaac SÁNCHEZ-JUÁREZ	
MACROECONOMIC ANALYSIS AND GRAPHICAL INTERPRETATION OF AZERBAIJAN ECONOMY IN 1991-2012	40
Khatai ALIYEV, Elchin SULEYMANOV	
RULES AND DISCRETION IN MONETARY POLICY: IS THE RESPONSE OF THE STOCK MARKET RATIONAL?	50
Ion-Iulian MARINESCU, Alexandra HOROBET	
PROPENSITY TO SEARCH: COMMON, LEISURE, AND LABOR MODELS OF CONSUMER BEHAVIOR	63
Sergey MALAKHOV	
ANALYSIS OF THE ECONOMIC RESEARCH CONTEXT AFTER THE OUTBREAK OF THE ECONOMIC CRISIS OF 2007-2009	77
Alin OPREANA, Simona VINEREAN	

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Editor's Introduction to Volume 3, Issue 1 of Expert Journal of Economics

Simona VINEREAN*

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The first issue of the third volume of *Expert Journal of Economics* presents very interesting theoretical and empirical analyses that investigate microeconomic and macroeconomic issues from different geographical frameworks and valuable global applications. This issue encompasses papers on cointegration of real estate prices, financial liberalization and its impact on Turkey's expansion, financial liberalization and its effect on developing banking crises, social networks theory applied to establish key sectors of Mexico's economy, evolution of Azerbaijan's economy, and monetary policy conduct and short-term efficiency of the domestic capital market. Further, I present a short description of each article published in *Expert Journal of Economics*, vol. 3, issue 1.

In Drachal's paper, namely '*Cointegration of Property Prices in Poland*', the author presents findings of a cointegration analysis based on the property prices in Poland, more specifically the offer prices and transactional prices examined on primary and secondary markets. This article offers a thorough analysis on quarterly data from Poland's biggest towns, by employing different techniques to examine the relationship between prices on primary market (which is more rigid in terms of negotiation terms) and secondary market (which offers more flexible negotiation possibilities).

Tutulmaz and Doğan's paper ('*Investment under Financial Liberalization: Post 1980 Turkey Case*') offers an insightful outlook of the liberal policies that lead Turkey to financial freedom and expansion. They explore the premises of financial liberalization, which generally includes removing the pressure on the interest rate, currency control and investment mobility, and exhibit the steps that were taken to bring this liberalization to Turkey. Moreover, the authors test the relationship between Foreign Direct Investment and Gross Domestic Product through an econometric model.

Another paper on financial liberalization, published in this volume, was written by Farhani, Mhamdi, Aguir, and Smida, in an article entitled '*Effect of Financial Liberalization on the Probability of Occurrence of Banking Crises*'. This paper examines the relationship between financial liberalization and the advent probability of banking crises because of institutional quality. More exactly, this research uses a logit panel to study financial liberalization (in its three dimensions of the domestic financial sector, financial markets, and capital account) and its impact on banking crises, using a sample of 50 developing countries in the 1990-2014 timeframe. Moreover, the authors compare their results with other studies' findings for interesting perspectives on financial liberalization.

The article '*Identification of Key Productive Sectors in the Mexican Economy*' represents a seminal work on Mexico's economy. Authors Revilla, García-Ándres, and Sánchez-Juárez apply the social networks

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theory and provide investigations of the essential sectors of this country in terms of hierarchy, impact and degree of articulation. They find that the manufacturing sector is the driving force of the economy. The techniques and results of this research are remarkable because of their application, explanations, and potential to influence political decisions to turn-around a stagnating economy. Also, this work is a cornerstone for other similar implemented studies to highlight promising sectors of different economies.

Aliyev and Suleymanov's paper (*'Macroeconomic Analysis and Graphical Interpretation of Azerbaijan Economy in 1991-2012'*) discusses the evolution of Azerbaijan's economy, during 1991 and 2012. This study approaches all the major transition periods in achieving its independence. During the initial years of the independence, there were different political and economic factors that blocked the start of privatization because of political instability and ongoing war with Armenia. Even though the Azerbaijan's economy experienced speedy economic growth, there were always discussions of this growth, especially after 2005 in terms of the dependency to the oil sector. Considering this important aspect, the authors analyzed GDP, industry and export trends in Azerbaijan economy, with and without contribution of oil and gas.

Marinescu and Horobet ask an interesting and current research question related to the relationship between monetary policy conduct and short-term efficiency of the domestic capital market, in their paper *'Rules and Discretion in Monetary Policy: Is the Response of the Stock Market Rational?'*. The authors use three countries to model and investigate this relationship, specifically USA, Canada, and United Kingdom. By using the event approach, their study offers interesting perspectives on the propagation of effects of the monetary policy in the real economy if the capital market represents an essential mechanism for resource allocation in the overall economy.

Malakhov's article *'Propensity to Search: Common, Leisure, and Labor Models of Consumer Behavior'* mathematically explores how the "common model", and its associated moderate propensity to search, compares to "leisure" and "labor" models of consumer behavior which tend to determine vigorous propensities to search that further lead to unnecessary acquisitions and overconsumption. The author further develops the equilibrium price in these models, in terms of willingness to pay and willingness to accept. It is also discusses the way in which vigorous propensity to search becomes propensity to produce at home, when considering home production.

Opreana and Vinerean (*Analysis of the Economic Research Context after the Outbreak of the Economic Crisis of 2007-2009*) developed a factor analysis based on secondary data that shows research directions in macroeconomics after the outbreak of the 2008-2009 crisis. Their study of 342 research articles, from 5 international journals (American Economic Review, European Economic Review, Journal of Economic Theory, The Journal of Economic Literature, and The Journal of Economic Perspectives), provides a detailed knowledge of the state of scientific research in the macroeconomics and more specifically which areas were given more importance than others in trying to determine the premises and consequences of the crisis.

A Final Thought

On behalf of every Member of our Editorial Board at Expert Journal of Economics, I would like to acknowledge and thank all of our Authors for their publishing collaboration, all of our Reviewers for their hard work and insights they shared with our Authors, and our Readership for downloading, citing, and expanding on the theoretical and empirical economics article we publish.



Cointegration of Property Prices in Poland

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This paper presents the analysis of cointegration between offer prices and transactional prices on both primary and secondary local real estate markets. 17 Polish biggest cities are considered and the period between 2006 and 2013. Generally, it is found that primary and secondary markets are not cointegrated.

Keywords: cointegration, primary market, property prices, real estate, secondary market, Poland

JEL Classification: R30

1. Introduction

The aim of this article is to present the outcomes from the statistical analysis of property prices in Poland. Different prices are discussed, i.e. offer and transaction ones. Moreover, they are taken from primary and secondary markets. As a result, 4 types of prices for each city are obtained. It is studied, whether a cointegration relationship can be found between them.

The data (BaRN, 2014) are taken from 17 biggest Polish cities: Białystok, Bydgoszcz, Gdańsk, Gdynia, Katowice, Kielce, Kraków, Lublin, Łódź, Olsztyn, Opole, Poznań, Rzeszów, Szczecin, Warszawa, Wrocław and Zielona Góra. All of them, except Gdynia, are capital cities of voivodeships. The period between 3rd quarter of 2006 and 3rd quarter of 2013 is analysed. Quarterly data are used.

In the first stage all time series are tested for stationarity with a help of Augmented Dickey-Fuller test (Hill et al., 2011). Then for each pair of prices, for a particular city, a linear regression model is evaluated (with one independent variable). In the second stage residuals of this model are tested (also by Augmented Dickey-Fuller test) for stationarity. Because data are quarterly, 4 lags are chosen. The cointegration is present, if both time series are nonstationary and residuals are stationary.

The calculations are done in Gretl statistical package (Gretl, 2013).

2. Literature Review

It is obvious, that when a model of property prices is constructed, it is crucial what prices are used. This might seem trivial at the first sight. However, one can hastily take offer prices, because they are usually easier to collect. For example, from newspapers, etc. But what constitutes the real part of economy are transaction prices. If the difference between offer ones and transaction ones is somehow "stable", then there is no problem.

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Secondly, there is a question, whether there is a "stable" relationship between prices on primary market and secondary market. Secondary market can seem more flexible, whereas primary market can be seen as less negotiable.

The described problem is crucial both in finances and management. For a general review of various methods of modeling property prices, for example, short reviews of Jadevicius (2014) and Brown et al. (2010) can be consulted.

Therefore, it is interesting and important to study the "stability" of the mentioned relationship. For example, Dittmann (2013) considered correlation between different types of prices. Another attempt can be to use the notion of "cointegration", which has just been explained. Actually, this procedure has been proposed by Engle and Granger (1987). Nowadays, it is very common tool in econometrics (Hill et al., 2011).

It is worth to mention that even high correlation do not guarantee long-term relationship. On the other hand, the presence of cointegration means that all differences between time series are random (Alexander, 1999).

The regional approach towards property prices in Poland has already been applied, for example, by Baldowska et al. (2014), Belej and Kulesza (2014), Leszczyński and Olszewski (2014) and Drachal (2014a, 2014b).

3. Analysis and Results

The results from the first stage are presented in Table 1.

Table 1. P-value of ADF test for initial time series

	primary		secondary	
	offer	transaction	offer	transaction
Białystok	0.0215	0.5343	0.4241	0.8286
Bydgoszcz	0.3259	0.0626	0.9362	0.7616
Gdańsk	0.1902	0.3498	0.7892	0.8789
Gdynia	0.0236	0.0236	0.7853	0.9632
Katowice	0.4502	0.2409	0.0696	0.6748
Kielce	0.1600	0.0030	0.2351	0.2837
Kraków	0.9962	0.8229	0.0511	0.0597
Lublin	0.0010	0.0001	0.1787	0.1288
Łódź	0.9321	0.9380	0.7814	0.5798
Olsztyn	0.2701	0.0838	0.2710	0.5242
Opole	0.5257	0.6643	0.0651	0.2011
Poznań	0.1687	0.0644	0.6132	0.1008
Rzeszów	0.9648	0.4845	0.7790	0.5711
Szczecin	0.0037	0.7671	0.9689	0.5842
Warszawa	0.5453	0.1773	0.9903	0.9533
Wrocław	0.6551	0.5300	0.9148	0.9895
Zielona Góra	0.0668	0.0075	0.6805	0.0014

Source: own elaboration in Gretl

It can be seen that, at 5% significance level, offer prices on the primary market are stationary in Białystok, Gdynia, Lublin and Szczecin. Moreover, in Gdynia and Lublin also transaction prices are stationary. It can be concluded that these two markets are stabilised.

But in Białystok and Szczecin transaction prices are nonstationary. So it can be concluded that although developers have offered the same prices, the transaction prices have been changing.

Another interesting fact can be observed in Kielce and Zielona Góra. They are transaction prices, which are stationary and offer ones that are nonstationary. It means that developers have been changing offer prices, but transaction prices have been the same.

All time series of offer prices on secondary market are nonstationary. It means that suppliers have been changing their prices. In case of transaction prices only in Zielona Góra the time series is stationary. In consistency with previous analysis, this market is stabilised. However, suppliers (both on primary and secondary market) have been changing their prices.

In other cities prices of both types on secondary market have been changing.

The results from the second stage of the cointegration testing are presented in table 2. The following abbreviations are used: op – offer prices on primary market, os – offer prices on secondary market, tp – transaction prices on primary market, ts – transaction prices on secondary market.

Table 2. *P-value of augmented Dickey-Fuller test for residuals*

	op, tp	op, os	op, ts	tp, os	tp, ts	os, ts
Białystok	0.9932	0.8594	0.6770	0.9237	0.1893	0.8322
Bydgoszcz	0.4908	0.9876	0.9282	0.9560	0.9721	0.3103
Gdańsk	0.5689	0.7003	0.7316	0.7074	0.7155	0.8347
Gdynia	0.0000	0.0385	0.5141	0.0385	0.5141	0.4060
Katowice	0.7112	0.6656	0.3815	0.6913	0.6714	0.8127
Kielce	0.3984	0.0000	0.0168	0.2162	0.7466	0.1475
Kraków	0.4939	0.9459	0.9842	0.8708	0.9769	0.8363
Lublin	0.4938	0.4783	0.7645	0.1384	0.6579	0.5200
Łódź	0.2728	0.8545	0.4947	0.8994	0.6572	0.7552
Olsztyn	0.3702	0.6642	0.5415	0.5520	0.4363	0.5937
Opole	0.8091	0.4916	0.6156	0.8338	0.8872	0.6692
Poznań	0.3652	0.2487	0.1209	0.2392	0.2263	0.0494
Rzeszów	0.9285	0.9876	0.9746	0.6554	0.4341	0.8447
Szczecin	0.4845	0.4519	0.5928	0.4835	0.7463	0.2125
Warszawa	0.3644	0.5665	0.4544	0.1506	0.0011	0.7631
Wrocław	0.7139	0.8555	0.9164	0.9427	0.9748	0.6884
Zielona Góra	0.3192	0.5916	0.6950	0.3388	0.1004	0.4273

Source: own elaboration in Gretl

The majority of considered pairs indicate no presence of cointegration (at 5% significance level). The only "candidates" are:

1. offer and transaction prices on primary market in Gdynia,
2. offer prices on primary and secondary market in Gdynia,
3. offer prices on primary and secondary market in Kielce,
4. offer prices on primary and transaction prices on secondary market in Kielce,
5. transaction prices on primary and offer prices on secondary market in Gdynia,
6. transaction prices on primary and transaction prices on secondary market in Warszawa,
7. offer prices on secondary market and transaction prices on secondary market in Poznań.

But considering results in table 1, it can be seen that pair 1 consists of stationary time series, therefore there is no indication of cointegration. In pairs 2 and 5 one of the time series is stationary. But pairs 3 consists of nonstationary time series, therefore cointegration is positively verified. The same is true for pairs 4, 6 and 7.

4. Discussion and Conclusion

The striking result is that empirically found cointegration relationship is not transitive. But it is clear that from the definition of this relationship it is transitive, indeed. Such a situation can be the result of taking relatively short time series and bias in testing procedure (Alexander, 1999).

Nevertheless, it has been found that there is practically no cointegration between two types of prices considered on two types of markets. This conclusion indicates that taking different type of property prices can significantly affect a constructed property price model in Poland. It is also important in case of constructing any universal property price index. Managers and financiers should take great care of this.

From the theoretical point of view, it is also worth to mention that there are known other cointegration testing procedures, e.g. Johansen test, which could give different results (Hill et al., 2011).

Finally, please notice that the discussed relationship is based on the assumption of linear relationship, which is some limitation.

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Investment under Financial Liberalization: Post 1980 Turkey Case

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In the history of the modern state of Turkey many policies have been developed and applied in order to transform ineffective economy to a dynamic and steady one. The liberal policies have been effectively applied except for war periods. The main activity of liberal policies in Turkey's economy was conducted on January 24, 1980 with some important structural adjustment decisions. These decisions aimed to integrate the economy with the global system by applying global economic order that widely adopted all over the world. The decisions aimed also to activate a financial liberalization in the country. Financial liberalization generally includes the principles related to removing the pressure on the interest rate, currency control and investment mobility. More liberalization steps came in 1989 aiming to increase the investment and growth. Foreign Direct Investment (FDI) was seen important for those purposes. However, short term capital flows, having been more effective in real investments than FDI, have led to several negative effects in this period. In this study some of the drawbacks of that process of financial liberalization have been discussed. The relation between FDI and Gross Domestic Product in the financial liberalization process has been tested with econometric implementation. Econometric estimation has been applied for this purpose to test this relationship for post 1980 era for Turkey as a developing country.

Keywords: financial liberalization, foreign direct investment, FDI, economic growth

JEL Classification E22, N24, F65

1. Introduction

Although a lot of economic policies have been applied in Turkey's history since 1923, the interventionist policies had been always more dominant until 1980. Especially the war or crisis periods have been the times that were detached from the liberal policies.

State interventionism was started to be left gradually in the post 1980 period. By the effect of liberalization era in the world, economic liberalization transformation reforms were declared on January 24th, 1980. These decisions were primarily used to establish the stability in its domestic and international markets. Because the stability is the primary feature that foreign direct investment (FDI) looks for when entering a country. Therefore, the stimulus programs prepared in order to promote to domestic production are facilitated

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for also FDI. FDI was expected to bring technology, knowledge and know-how so that it was expected to help in growing economy. In this aspect FDI was given an important place in the macroeconomic policy of the country.

The reforms planed in 1980's financial liberalization decisions were brought into the reality in a large extent in a decade. By the means of that policy the controls over the interest rates and currency exchange were removed and the capital flows were liberalized. However, this financial liberalization had not brought the expected positive effect on the growth or decrease in the dependence on foreign capital. This experience brings the questions on the effectiveness of liberalization policies in developing countries since the success of the liberalization in developed world has not been generally seen in the developing countries. The liberalized interest rates led an increase in incoming short term foreign capital instead of an increase in domestic savings. Liquidity of short term foreign capital leads to fast capital outflows in the crisis times. This liquidity, consequently, increases the economic instability of the system in the crisis. Accordingly, there have seen an increase in the number of crisis in the country; in contrast, the portion of FDI in developed economies has been higher before and after economic liberalization.

In this paper, first the concepts of liberalization and financial liberalization are investigated in the second section. In the third section, the process of the liberalization and financial liberalization in Turkey is taken into account. In the third section, an empirical model is applied for the relationship of FDI with economic growth.

2. Liberalization

Liberalization, literally means making free; applied in economics, it means to make the economy (in a large extent) free from the state and to let the market run the economy as much as possible.

As one of the important concepts that affected modern economies in the world, liberalization can be defined in general terms as 'removal of uncompetitive factors and of the obstacles against the free circulation of goods, services, labors and capital' (GEU, 2009).

Going through the definitions, we can see that liberalization aims to abolish the economic borders among the countries whether they are developed or developing countries; in this aspect of the meaning of the word, it closes to the 'globalization'.

2.1. Financial Liberalization

In a narrow definition, financial liberalization means to remove the controls on bank account and credit interests; in a wider definition, it means to abolish the classifications of the activity of institutions, to decrease and abolish the controls on exchange, to remove the obstacles on the foreign accesses to domestic financial system, and the obstacles on the national access to international financial system (Williamson and Mahar, 1998:2).

In a different definition financial liberalization is defined as a result of the deregulation activities by which the controls and restrictions on the financial and banking system are abolished; therefore, it is defined as a process of opening to international capital flows.

The justification of the financial liberalization lies beneath the criticizing of the government intervention and control on the economy. According to that analysis, an intervention to economy means the external determination of interest rates to the market and the restriction of the capital flows. In this concept, a maximum level of interest rates would distort the consumption plans towards today, meaning inter-periodic changes. This kind of inter-periodic changes decrease today's savings and therefore negatively affect the investments. Moreover, a maximum level of interest rate causes a negative real interest rates in inflation times, leading to a valuation of national money and damage in export sector. With this analysis, financial liberalization criticizes the government intervention and defends the efficiency of the liberal policies.

Another important issue with the financial liberalization is its different efficiency levels according to the development levels of countries. Developed financial infrastructure and financial tools of developed countries prepare an available base for liberalization policies. However, the liberalization situation in developing countries is not only related with the financial markets but it is related with the radical economic transformations coming up in their development path (Tuncel, 2010: 100).

There are different applications of financial liberalization in domestic and international markets. However, they should both be applied in order to be efficient. Domestic financial liberalization means the removal of controls and restrictions which causes financial shrinking and to obtain that the nominal interest rates should be determined by banks instead of the government and the interest rates should be determined in the market according to demand and supply. The foreign financial market liberalization, on the other hand, is

defined as the removal of the controls on exchange rates in order to unification with the foreign financial markets and to maintain of that the exchange rates are determined in the market by exchange demand and supply. Moreover, the unlimited capital circulation of capital and the equalization of factor prices in long term consists the other expected results from the liberalization process (Williamson and Maher, 1998: 8-11).

At first the developing countries followed a negative attitude against the financial liberalization. After 1980, the maximum interest rates, obligatory reciprocal rates and the restrictions on the international capital flows were abolished. (Demirgülec and Detragiache, 1998: 2). Therefore, the domestic and international financial liberalization movements can be evaluated as that they brought a wider scale economic liberalization and preceded the financial globalization.

3. Post 1980 Turkish Economy

3.1. 1980-1989 Period

In this period of 1980-1989, Turkey had done important changes in economic policy and applied domestic financial liberalization. There were political openings aiming the real sector and trade liberalization in the first step; but the policies for financial liberalization were also added to them.

In 1980, the first step in liberalization of economy was taken by the January 24th decisions. The January 24th decisions are an important milestone showing that Turkey connects world markets. There are 2 opinions on this process. First opinion defends that this process is a revolutionary integration process by which the country opened itself to the world; second opinion proposes that the policies of detachment from national industry, national trade and promoting agriculture are actually the continuation of the harmonization policies used to open the country to the international capital (Öztürk, Nas and İçöz, 2008: 16). These two opinions show that there are positive and negative evaluations on the January 24th decisions. The main points of January 24th decisions are listed as below:

1. The macro level decisions instead of micro level decisions should be preferred in order to maintain integrity, consistency and compatibility in economy.
2. The potential and dynamism of the private sector should be maximally facilitated in production and export sectors.
3. The control of inflation should be maintained primarily. A healthy growth should be aimed after controlling inflation.
4. In order to control inflation the monetary and credit policies should be under control and the government financial deficit should be eliminated gradually; the central bank loans to the Treasury should be followed tightly.
5. The unutilized capacity should be first facilitate before initiating new investments
6. To increase the export rapidly, a realist and elastic exchange policy should be followed parallel to the other precautions.
7. A realistic interest policy should be followed in order to increase savings and channeling them by fiscal institutions.
8. The foreign private capital should be promoted in order to eliminate the domestic and foreign financial deficit and in order to increase the investments so as to increase employment (Parasız, 2003: 283-284).

After the January 24th decisions listed above, the main changes performed in this period can be given as below:

1. Lira (TL) was devaluated from 1 US Dolar = 1.47 TL to the exchange rate of 1 US Dolar = 70 TL.
2. Export Promotion Fund (EPF) was founded by the Central Bank and a certain amount from the Support and Price Stability Fund and from the export guarantee deposits were transferred to the EPF.
3. Efforts to eliminate the KİT deficits and governmental sector deficits were conducted (Cura, 1998: 134).

The economic program of 24 January 1980 deemed the foreign capital as a must for economic growth, therefore, the private foreign capital has been regarded a privileged place in the program. First, a bylaw, called 'Foreign Capital Frame Bylaw' (Yabancı Sermaye Çerçeve Kararnamesi), was legislated in order to remove the bureaucratic obstacles in front of foreign capital inflow. With this bylaw, a condition that a part of production depends on foreign investment must be exported was legislated (Savru, Ozekicioğlu and Ozel, 2013: 230). The purpose of this regulation was to decrease the government role in economy and stimulate the export.

3.2. 1989-2001 Period

The liberalization movement that started after 1980 first became effective in the trade and production areas. Between 1980 and 1989 all necessary financial regulations were made and the integration to market economy was completed.

By the decisions of 24 January 1980 various policies were applied to increase the investments and to establish the stability and eventually an improvement was observed. This improvement went into another phase with the introduction of Decree No. 32 in 1989 to continue the liberalization reforms by financial liberalization steps, which can be seen as advance level of liberalization (Unsal, 2003: 191). By Decree No.32, first, all exchange controls were established and consequently the international capital flows started to be effective in the domestic markets (Kar and Tatlısoz, 2008: 4).

In 1984, a regulation, Decree No.30 related to the law numbered 1567, launched a quasi-control regime for currency exchange and this regime lasted until 1989. By the Decree No.32 this transformation had been completed in 1989 and all hurdles against the liberalization of capital circulation in domestic markets were removed. Some of the important articles of the Bylaw are given below:

On the foreign capital to come to the country:

Article 12- (1) Foreign investments aiming Turkey will be evaluated according to the Law no. 4875, the Law on Foreign Direct Investments.

(2) The profit, sales revenue, license, compensation, interest and other expenses which are outcomes of the foreign investor's activities in Turkey can be freely transferred to abroad.

(3) According to Petroleum Law no 6326 the activities in Turkey and transfer demands subject to this law.

On the domestic capital to leave the country:

Article 13- (1) Individual placed in Turkey can freely transfer capital abroad via banks to invest or to conduct trade activity, to establish incorporation, under the custom rules.

(2) Individual placed in Turkey can freely transfer the establishment or running expenses of their abroad brands, representatives or bureaus.

(3) Banks and custom authorities inform the Ministry Undersecretariat about the exporting capital to abroad in 30 days.

(4) Ministry is authorized on requesting the information and the documents from individuals related with applications of this law (TCMB, 1989).

Beginning from 1989, the governmental authorities launched a new economic policy that aims to keep the devaluation of Turkish Lira (TL) against Dolar and Mark under the inflation. TL started to evaluate against foreign exchanges especially in 1989 and 1990; and after 1991 the high interest policy to attract the foreign capital helped to expand the exchange supply (Uysal, Mucuk and Alptekin, 2008: 53).

The Decree No. 32 came into effect in 1989 was effective to change the country's economic direction. However, it had been observed that the liberal policies could not be effective to increase the real investments, rather it helped that the short term capital had a major role in operating of the country's economy.

3.3. Post 2001 Period

After the Decree No. 32 came into effect in 1989, Turkish economy experienced a several economic crises in 1994, 1997-1998, 2001 and consequently went under IMF stability programs.

A program to deal with the 2001 crisis was announced on 14 April and 15 May 2001 in two steps. The program was called as national program first, and afterwards as 'Program for Transition to a Strong Economy' (Ay and Karaçor, 2006: 71).

The Program for Transition to a Strong Economy (PTSE) was put into effect in three steps. It was announced that it had been planned to get financial sector under control in first step, the foreign deficit and inflation would be dealt in second step and the growth rate would be increased by the applications aiming the structural changes in the last step (Karacor and Kol, 2012: 387). The program generally focused on the opportunity to facilitate from the strong international economic resources; however, it didn't take the negative parts of the short term foreign capital in account. Actually, the program can be seen as a continuum of the rule of the Decree No. 32 on the manner of capital mobilization. The program did not either consider on that an exchange expand could lead to an import surge and its consequences as capital outflow. With this arguments, the program has been criticized as the possible outcomes might be reverse of what was aimed; and it could have possibly led to a total dependence to international capital instead of facilitating from the foreign

economic resources (for example see, BSB, 2001). Parallel to these critiques, after PTSE launched in 2001 the dependence on short term foreign capital and foreign currency financing deficit has increased.

4. Foreign Direct Investment (FDI) and Growth in Financial Liberalization Process: An Application

4.1. The Literature Survey on the Relationship between FDI and Growth

There are quite a lot studies investigating the relation of financial liberalization with economic variables. These studies show different results according to the countries they were applied. A brief scan of literature is given below.

Mario Carcovic and Ross Levine (2002) tested the relationship between FDI and growth by using a data set including 72 countries. The application uses countries' data for the period 1960-1995 and. Ordinary least square (OLS) method is used in the first step of the application, a dynamic panel data is structured by using the 5 year averages in the second step. A negative relationship between FDI and growth is detected in the paper.

The relationship between FDI and economic growth has been tested by the paper of Fatma Turan Koyuncu (2011). The paper used the causality test for analyzing the relationship. 3 month data set for the period of 1990-2010 taken from Central Bank's data base is used in the paper. The analysis resulted that the variables are stable and FDI affects the economic growth in positively.

De Mello (1997) used a data set consists of 32 non-OECD countries. The paper detected a positive relationship between FDI and economic growth.

Onur Sara (2005) tested the relationship between a set of variables consist of openness, financial development and financial liberalization with the economic growth by using Granger causality test. The paper detected a single direction relationship in 1 % significant level between openness and financial liberalization, growth and financial liberalization, growth and financial development. The paper detected a double direction relationship in 1 % significant level between growth and openness. It is also detected a single direction relationship in 5 % significant level between financial development and financial liberalization, financial liberalization and openness, financial liberalization and growth, financial development and growth.

Ayberk Nuri Berkman (2011) tested the relationship between FDI and economic growth using a data set consists of quarter data between the periods 1987: 01 and 2011: 02. Causality test detected a causality relationship from financial liberalization to growth.

Ağayev, Seymur (2010) tested the relationship between FDI and economic growth for 25 transition economies by panel data, panel cointegration and panel causality tests. The paper detected a positive effect of FDI on economic growth.

Okuyan and Erbaykal (2008) conducted an empirical research by using causality test on 9 developing countries. These 9 developing countries consists of Brazil, Mexico, Malaysia, South Korea, Thailand, Turkey, Singapore, Indonesia and India. For the period of 1970-2006; and tested the causality relationship of FDI with economic growth. Authors concluded that the economic growth cause an increase in FDI for the 6 of these countries including Brazil, Mexico, Malaysia, South Korea, Thailand and Turkey. Moreover, a reciprocal causality is detected for the data of Singapore and Indonesia, and a causality relationship from FDI to economic growth is determined for India.

Babajide Fowowe (2008) used Generalized Moments Method (GMM) to test the relationship of financial liberalization with economic growth for the data set of Sub-Sahara Africa for the 1978-2000 period. The research concluded a positive relationship between financial liberalization and economic growth.

Ben McLean and Sona Shrestha (2002) conducted a panel data analysis consists of 40 countries for the period of 1976-1995. The econometric model analyzed the effects of various capital flows to the economic growth and concluded that the FDI and portfolio investments affected growth positively; on the other hand, bank credits affected growth negatively.

Imran Sharif Chaudhry (2007) determined a positive relationship between financial liberalization and economic growth for Pakistan for the period of 1972-2006. Chaudhry concludes that the financial liberalization process pulled the growth rates upward.

David T. Tswamuno, Scott Pardee and Phanindra V. Wunnava (2007) tested the relationship between the financial liberalization and economic growth for South Africa for the time period of 1973:3 – 2005:1. Estimations showed that financial liberalization affected growth positively in the first years, yet the volatility experienced recent terms has not positively affected to South African economy.

As it can be seen here the biggest part of the financial liberalization literature consists of researches investigating the effects of FDI on economic growth. The role of economic crisis and the other macroeconomic variables in this relationship is also tested in literature.

4.2. Data and Method

The empirical model applied in this paper was first applied for Uganda by M.B. Obwana (2001) and then for Turkey by Onur Demirel (2006). Both papers used simultaneous models. Our paper, taking the model for a Turkey application, also estimates as single equations by using the Ordinary Least Square (OLS) method and compare the results with the ones from the estimations of simultaneous equations. Our paper tries to test the relationship of FDI with economic growth in Turkey after the financial liberalization takes start off in 1980 until 2013. On the other hand, because of encountered data problems for some of variables, the data set was restructured as 1984-2010.

During constructing the data set for the econometric model we facilitated the online data from the official websites of Turkish Statistical Institute (TurkStat), Ministry of Development, Treasury Undersecretariat, Central Bank of the Republic of Turkey (CBRT/TCMB), Ministry of Economy and Ministry of Finance. Most of these data are in current terms. Real data series of the variables GDP, FDI and S (domestic savings) have been obtained from global data networks of IMF, WB, OECD and UNCTAD in real terms. IMF: International Money Fund (www.imf.org); WB: World Bank (www.worldbank.org); OECD: Organizations of economic Cooperation and Development (www.oecd.org); UNCTAD: United Nations Conference on Trade and Development (www.unctad.org). Explanations of the variables are given under the Eq. (2) and (3) of the model.

4.3. Econometric Application and the Results

The estimated econometric model aims to determine the direction of the relationship between GDP and FDI in post-1980 Turkey. The aim of our paper is to determine the effect of the liberalization on the country's economy, therefore especially the after 1980 data are used for this purpose.

$$Y_i = \beta_1 + \beta_1 X_i + e_i \quad (1)$$

First, the single equations as represented in Eq. (1) are estimated separately by OLS method. In these estimations it is aimed to determine that the effect of FDI and other variables on economic growth (GDPG) in the first equation; similarly, the effect of economic growth and other variables on FDI in the second equation.

The open forms of the estimated equations are given in Eq. (2) and (3) below:

$$GDPG_t = \beta_0 + \beta_1 FDI + \beta_2 S + \beta_3 XG + \beta_4 FA + e_{1t} \quad (2)$$

β_0 : Constant term
 GDPG: GDP growth rate (%)
 FDI: Foreign Direct Investment (Milyon \$)
 S: Domestic savings rate (%)
 XG: Export growth rate (%)
 FA: Foreign aid income
 e_{1t} : Error term

$$FDI_t = \beta_0 + \beta_1 GDPG + \beta_2 GDP + \beta_3 INF + \beta_4 S + \beta_5 PI + \beta_6 DUMMY + e_{1t} \quad (3)$$

β_0 : Constant term
 GDPG: GDP growth rate (%)
 GDP: Gross Domestic Product (Milyon \$)
 INF: Inflation (TUFE) (%)
 S: Domestic savings rate (%)
 PI: Public investment as percentage of GDP (%)
 DUMMY: Dummy for GDP
 e_{1t} : Error term

Table 1. Estimations of OLS Model

Growth Equation			FDI Equation		
Variable	Coefficient	t-stat	Variable	Coefficient	t-stat
C	-4.60	-0.76	C	-2.63	-0.81
FDI	-6.89	-0.26	GDP	0.14	4.47***
FA	-4.05	-1.01	GDPG	-84332831	-0.55
S	8.02	1.24	INF	-56113526	-1.96**
XG	0.16	2.04**	S	5.33	2.58***
R ² = 0.27			DUMMY	1.5	0.82
*10%, **5%, ***1% significance levels			PI	-3.27	-2.66***
			R ² = 0.78		

Table 1 shows the estimations results of econometric application. The coefficient of determination (R^2) shows to what extent dependent variable can be explained by the independent variables. In growth equation, R-square is determined 0.27. This explanation level of dependent variable by independent variables can be thought as a low value. R^2 is 0.78 in FDI equation, higher than the one in the growth equation, it can be deemed as good level for estimations.

In the estimations of growth equation, XG and S are determined positive; FA and FDI are determined negative. XG was estimated in 5% significance level. It is normal that increases in export increase the economic growth; however FDI was not estimated significant by the data of investigated period. The significant role of FDI in economic growth of developed countries could not be determined for Turkey. More importantly F statistics cannot confirm overall significance for first equation. This result puts the statistical inability of the model for Turkey data more clearly signaling insignificant role of FDI in recent growth experience of Turkey.

This study aiming to re-test the explaining power of the previously applied simultaneous equation by referencing Obwana (2009) finds an inability in this aspect. The estimations of the simultaneous model doesn't give meaningful results, and this is consistent with the growth equation insignificant estimation above and the Hausman test for simultaneity as well.

The empirical simultaneous equations estimated in this paper are given in Eq. (4). The same variables as used in Eq (2) and (3) are used here, therefore they are not explained again here.

$$GDPG_t = \beta_{20} + \beta_{21} FDI + \beta_{22} S + \beta_{23} XG + \beta_{24} FA + e_{1t}$$

$$FDI_t = \beta_{10} + \beta_{11} GDPG + \beta_{12} GDP + \beta_{13} INF + \beta_{14} S + \beta_{15} PI + \beta_{16} DUMMY + e_{1t} \quad (4)$$

In this sense our results contradict with the results of another Turkey application of the Obwana model (see, Demirel, 2006). This difference should be caused by the different data structure and source because the data sources and the lengths are different. However, this apparent differentiation also puts a question in terms of the reliability of the simultaneous model.

Despite the fails of the simultaneous model application of (4), single equation estimation of FDI equation gives reliable results. In FDI equation, GDP, DUMMY and S are determined as positive; INF, GDPG and PI are determined negative. In the estimations, PI, S and GDP are determined statistically significant at 1% level; INF is determined significant at 5% level. GDP level has been found significantly related with FDI. PI can be related with the consumption behavior; therefore it is included in the model. PI can be deemed as a way to affect the consumption behavior in a society; in this aspect, the increasing consumption behavior has affected GDP level in this period (despite the overall insignificance of the first equation). S and INF are also found significant for describing FDI. S and stable INF can be effective in determination of FDI via affecting the GDP levels.

5. Conclusion

Starting from 1980 the liberal policies brought a real unlimited freedom to Turkish economy. In this period of transformation the country has introduced many new regulations.

However, these regulations could not bring the intended success. Financial liberalization has worked for the profit realizing foreign capital at the high interest periods instead of intended stability and growth. The failure in achieving the stability and growth in the country also affected back in attracting FDI, in a vicious circle. The result of the econometric application in this paper showed signs in this way. Having been significant

in FDI numbers, growth in GDP could not be stable enough to make FDI numbers effective and significant in describing the GDP itself.

As a result, the outcomes for Turkey remind us the differentiation of the successes of FDI in developing and developed countries. Not having stability in their economy, developing countries could not be successful in FDI applications. On the contrary, the liberal policies have led insatiability to escalate inside the countries. In this context, the escalated instability can be seen related with the high number of economic crises of modern economies in recent decades.

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Effect of Financial Liberalization on the Probability of Occurrence of Banking Crises

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This study examines the relationship between financial liberalization and the advent probability of banking crises because of institutional quality. We used a logit panel data for a sample of fifty developing countries during the period (1990-2014). The results show that there is a positive relationship between financial liberalization and banking crises and the strengthening of institutional quality overcomes the problem of banking crises.

Keywords: banking crises, financial liberalization, institutional quality.

JEL classification: G01, G11, G15

1. Introduction

Recently, several economies have undergone major transformations, regulatory and institutional in nature. These changes have altered the functioning of institutions and capital markets. The origin of these changes comes mainly from financial liberalization in the 1980s and which affected almost all emerging countries. McKinnon and Shaw (1973) analyzed the phenomenon of "financial repression" which is characterized by excessive government intervention in financial activity. Financial liberalization has been proposed as a response to this situation because it improves the efficiency of investment and eventually economic growth. Overall, financial liberalization has been broken down into three major reforms. This is the liberalization of the movement of capital, the opening of financial markets to international operators and deregulation in lending and deposit rates to increase interbank competition. The proliferation of crises in countries such as Mexico (1995), Asian countries (1997), Brazil (1998), and Turkey (2001) opened the debate on the benefits of deregulation of financial activity.

It is generally accepted that the economic theory of liberalization opposes school financial repression to that of neo-structuralisms. The first finds its theoretical origins in the work of two economists from Stanford McKinnon and Shaw School (1973). Both authors present financial liberalization as an effective and simple strategy to accelerate economic growth. This financial liberalization has been proposed as a response to what

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the authors called "Financial Repression". However, Taylor (1983) and Van Wijnbergen (1983) challenged the validity of this analysis. Starting from a structural view of the economy, they felt that a policy of financial liberalization rather leads to slower economic growth.

In this context, Roubini and Sala-i-Martin (1992) were the first to prove empirically that there's a negative effect between financial repression and economic growth. For them, a liberalized economy is growing faster than so-called repressed economy. For his part, Honing (2008) showed that the mobility of capital has major benefits for the economies concerned, particularly when it comes to the efficient allocation of resources. The new funds represent a new source of financing for domestic investment. It provides new opportunities for these countries to diversify risk and promote subsequent financial development. These words are affirmed by Emran and Stiglitz (2009), which stipulate that a liberalized and competitive market is seen as a necessary condition for the success of the private sector promoting financial development.

As regards the effects of crises, Caprio and Klinderberger (1996) identified 117 crises since the seventies decade in ninety-three countries. These authors confirm that banking crises in developing countries have been tougher and more expensive than those that have affected more advanced economies. In contrast to the latter, the cost of crisis resolution in less developed countries exceeded 10% of GDP (Venezuela 18%, Mexico 15%, Bulgaria 14%). Incidentally, Plihon and Miotti (2001) state that *"The emerging countries of Latin America and Asia have been particularly affected by the banking crisis, the cost was often considerable."* Confirming the point of view of Caprio and Klinderberger, they reported estimates of the cost to the taxpayer to rescue the banking systems involved. Thus, these costs have been estimated at 15% of GDP for Mexico (Peso crisis in 1994-1995) and Venezuela. Compared to the crises of US savings banks in the 1980s (3.5% of GDP) and banking crises in Scandinavia (5-7% of GDP), these costs are relatively high. In the same vein, a study by Honohan and Klingebiel (2000) on a group of thirty four countries with economies in transition in the period 1970-2000 confirms that banking crises emerge additional losses to the economy as , reduced investment and consumption mainly due to credit rationing.

Contrary to the prevailing theory in the 1980s, the proliferation of banking and financial crises, particularly in Asia and Latin America, has led some researchers to review the effects of this liberalization or even question it. Indeed, the number of such attacks has increased significantly and even quadrupled from 1970 as well as a large number of banking crises was preceded by measures that promoted economic liberalization (Kaminsky and Reinhart 1996) , (Caprio and Klingebiel 1996).

Miotti (2001) Kunt and Detragiache (1998) have demonstrated the existence of a close relationship between the banking and financial crises and financial liberalization policies in emerging countries. Alfaro and Hammel (2007), Kim and Kenny (2007), believe that in developing countries, financial liberalization is a vital and necessary step to abandon financial repression and lead to a situation of sustainable growth. However, Ranciere et al. (2006) conclude that the literature has spawned two completely divergent currents. The first considers that it strengthens the financial development and contributes to sustainable economic growth. The second states that financial liberalization leads to excessive risk-taking. It increases the volatility of macroeconomic indicators and is responsible for the recurrence of banking crises.

It is in this context that lies our empirical investigation test. We will try and verify empirically whether financial liberalization, in its three dimensions (of the domestic financial sector, financial markets and capital account) helped trigger banking crises. In addition, our study is whether the strengthening of the institutional framework mitigates the likelihood of banking crises in developing countries. We studied a panel composed of fifty developing countries (the countries of Asia, Latin America, Africa and the Middle East) that have experience more or less successful in terms of financial openness. Our study spans the period from 1980 to 2014. The choice of this period is justified by the fact that it represents the episodes of financial deregulation and banking crises movements that affected many developing countries and the availability of data for some of these countries.

2. Empirical Methodology

In order to identify the impact of the liberalization of the domestic financial sector, stock markets and the capital account and the effect of institutional quality on the probability of occurrence of banking crises in developing countries, we have resorted to estimates by modeling logit panel data.

The dependent variable in our model represents the banking crises defined as follows:

$$y_{it} = \begin{cases} 1 & \text{if crises} \\ 0 & \text{otherwise} \end{cases}$$

with $i = \{1, \dots, N\}$; $t = \{1, \dots, T\}$

This type of regression investigates the relationship between a binary response variable and several explanatory variables. She returns to test the probability of occurrence of crises by encoding (0,1). This coding choice (0.1) is traditionally held by the dichotomous models.

Thus, the holding pattern, in this case, is the following:

$$y_{it} = \hat{\beta}X_{it} + \varepsilon_{it}$$

with $i = \{1, \dots, N\}$, $t = \{1, \dots, T\}$

$$y_{it} = \begin{cases} 1 & \text{if crises} \\ 0 & \text{otherwise} \end{cases}$$

y is the vector of dummies variables of banking crises, $\hat{\beta}$ represents the vector of unknown N coefficients to estimate, X is the matrix of explanatory variables and ε residue matrix. y_{it} denotes the vector of binary variables taking the value of a banking crisis in the country i in year (t) and the zero otherwise, we can write:

$$P_i = \text{Pr ob}(Y_{it} = \frac{1}{X_i}) = F(\beta X_i)$$

or

$$E(Y_{it}) = \text{Pr ob}(Y_{it} = 1) * 1 + \text{Pr ob}(Y_{it} = 0) * 0 = \text{Pr ob}(Y_{it} + 1) = P_i$$

$i = 1, \dots, N$

The function F is, the repair function of the logistic:

$$F(\theta) = \frac{e^\theta}{1 + e^\theta} = \frac{1}{1 + e^{-\theta}} = \cap(\theta)$$

According Hurlin (2003), the logit model defines the probability associated with the event $Y_i = 1(p(Y_{it} = 1))$: Probability of occurrence of banking crises or even high bank fragility in country i in year (t)

$$\text{Modèle logit } P_i = \cap(\beta X_{it}) = \frac{1}{1 + \exp(-\beta X_{it})}; \forall i = 1, \dots, N$$

The most commonly used to estimate the parameters of the logistic regression method, consists of the maximum likelihood method. The latter provides estimators good statistical properties.

More concretely, a logistic coefficient indicates that for each additional unit of X_i , the logit increases β . From a practical point of view, the likelihood of the dichotomous logit model is written as follows:

$$L(y, \beta) = \prod_{i=1}^N \prod_{t=1}^T P_i^{y_{it}} * (1 - P_i)^{1-y_{it}}$$

The logarithm of the likelihood and given by the following relationship:

$$\text{Ln}L(y, \beta) = \sum_{i=1}^N \sum_{t=1}^T \{ y_{it} * \text{Ln}[F(X_i\beta)] + (1 - y_{it}) * \text{Ln}[1 - F(X_i\beta)] \}$$

It is the function of the multi-variable logit model.

The purpose of these econometric models is to explain the birth of an event with the help of a number of explanatory variables.

3. Data Description

Financial liberalization is identified because of three elements: the deregulation of the domestic financial sector, liberalization of stock markets and the opening of the capital account. As part of our study, we will remember these three dimensions of financial liberalization. Thus, financial liberalization indicator is a composite index of three aspects of financial deregulation.

$$LF = \frac{1}{3} LSFI + \frac{1}{3} LMF + \frac{1}{3} LCC$$

$$SI. \begin{cases} = 1, & \text{financial repression} \\ = 2, & \text{partial liberalization} \\ = 3, & \text{total liberalization} \end{cases}$$

For measuring variables of internal and external financial liberalization we will use in our study, Kaopen indicator developed by Chinn and Ito (2005) to measure the degree of restrictions on capital account. In fact, the last update made in 2011, provides an indicator for more than 180 countries over the period (1970-2011).

This indicator mainly constructed by the method of principal component analysis, has the advantage that it seeks to measure the intensity of restrictions on capital account, not its presence or not. In addition, it covers a growing number of countries (170 countries) for a long period (1970 to 2011). It varies between 1.7 and 2.6. The higher the value, the greater the country in question the capital account is liberalized. In other words, this index takes higher values when that country is more open to international transactions.

To measure the degree of liberalization of stock markets, we retain, a result, the ratio:

$$\frac{\text{portfolio flows as shares} + \text{portfolio flows as bonds}}{GDP}$$

By definition, portfolio flows in shares representing the sum of the representative of Foreign Action Certificates and national securities held by foreign investors. While portfolio flows in bonds represent bonds purchased by foreign investors.

Theoretically there are two effects of liberalization of financial markets. The first has a positive and significant effect on the probability of occurrence of banking crises, as Miotti and Plihon shows (2001).

The second one, the market liberalization reduces the probability of banking crises by encouraging the development of monetary and financial instruments allowing banks greater diversification of their risks.

To measure the degree of domestic financial liberalization, we had reference to the study by Hamdi Khalfaoui that uses two key indicators to assess the level of development of indirect finance through the degree of channeling capital to the private sector and efficiency of financial intermediation. These indicators are:

- Credits granted to the private sector as a percentage of GDP (CSP) expressed in logarithm. The expected sign is negative justified by the fact this ratio and more, the banking sector is less developed and this can create a banking crisis. It indicates the ability of banks to mobilize and improve its allocation.
- The broad money as a percentage of GDP (M2) e é expressed in logarithms: it represents resents payment methods which is added to almost liquidity.

This indicator reflects the liquidity of the economy and it is supposed to have a positive sign. Thus, if the economy recorded a significant growth rate of the money supply in the sense of M2, it may cause a banking crisis. This variable was extracted from the database of the World Bank.

About banking variables, we used to study Kibritcioglu (2002), to identify a monthly index, similar to that of the pressure on the foreign exchange market. The purpose of the adoption of this index is to measure and predict episodes of fragile banking sector.

In particular, the author has shown that there are three main greatness in the consolidated balance sheet of banks that may be useful in the construction of the index of fragility of the banking sector, namely, bank deposits, loans to the private sector, and external liabilities of domestic banks.

Fluctuations of indicators and likely to prove the fragility of the banking sector in a country. These variables were extracted from the database "Financial Statistics International "from the IMF.

However, deflated nominal series, we used the GDP deflator extracted from the World Bank database and this because of the unavailability of data for the entire sample price indices in the database IMF data. Once deflated series, the index of banking sector fragility (FSB) can be calculated as follows:

$$FSB_t = \frac{\left(\frac{DB_t - \mu_{db}}{\sigma_{db}} \right) + \left(\frac{CBSP_t - \mu_{cbSP}}{\sigma_{cbSP}} \right) + \left(\frac{EEB_t - \mu_{eeb}}{\sigma_{eeb}} \right)}{3}$$

where:

FSB_t = fragility of the banking sector

DB_t = annual variation of banking deposits year t

μ and σ = represents respectively the arithmetic mean and the standard deviation of variables.

$CBSP_t$ = annual change in bank credits to the private sector

EEB_t = annual change in commitments exteriors domestic banks

If the FSB index is between -0.5 and 0, so the banking system is considered in average period of fragility. But, if FSB is less than -0.5, so the banking sector is considered highly vulnerable to systemic crises. To arrive at a base in binary form, we have transformed the FBS values so that gives the value 1 at any FSB and 0 at any FSB. In total, an index of banking sector fragility (FSB) is constructed and transformed for the entire sample consists of forty developing countries over the period (1980-2011).

To assess the impact of institutional variables on the probability of banking crises and empirically test whether the quality of the institutional structure is a determinant of banking crises in developing countries, we have used as a measure of degree of institutional quality, the 'legal systems and property rights' indicator. This indicator is composed of five variables which are: the rules of law, judicial independence, legal system integrity, the existence of objective being and protection of intellectual property. This variable was extracted from the database of "The International Country Risk Guide" (2009). However, and given that this variable is available only for frequencies during the five-year period (1980-2000) and the institutional quality variable does not change in the short term but it changes very slowly, it was considered the value corresponding to the year (t) remains the same until the year (t + 4). This method was proposed by Chinn and Ito (2005), whose objective is to annually exploit available data on five years.

The variable is between 0 and 10, the higher its value, the higher the institutional framework of the country in question is solid, and vice versa.

We selected four macroeconomic and financial variables that are likely to capture the effect of macroeconomic shocks and financial situation on the occurrence of banking crises. As a macroeconomic variable, we basically chose two indicators Knowledge:

- Inflation (The expected sign of this variable is positive).
- The level of activity report economic (the expected sign of this variable is negative).
- Financial variables used in this study are:
- The ratio M2/international exchange reserves expressed in logarithm: This indicator represents the ability of banks to face its External commitments. Thus, more the ratio is high, more the economy is vulnerable to investor confidence crisis. From where the expected sign should be positive.

$$\frac{M_2}{\text{international exchange reserves}}$$

4. Empirical Results

This study draws on studies and Lukkarila Komulainen (2003) and Eichengreen and Arteta (2002), Wyplosz (2001) and Williamson and Mahar (1998) focused on the impact of internal and external liberalization of banking instability. The proposed model is as follows:

$$Prob(CB_{it} = 1) = F(\alpha X_{it-1} + \beta LF_{it})$$

As stated above, the Kaopen indicator constructed by Chinn and Ito (2005), which varies between 1.7 and 2.6 is a liberalization indicator. Thus the higher its value, the greater the country's capital account in question is liberalized. Estimating the effect of liberalization of the capital account on the probability of banking crises give the following results:

Table 1. *The effect of liberalization of the capital account on the probability of banking crises*

Variable	Coefficient	Std Error	Z-Statistic	P > z
Kaopen	-0.11325	0.04426	-2.55	0.010
M2\Reserve	0.07030	0.02141	3.28	0.015
GDP	-0.07846	0.01671	-4.96	0.000
GDC	-0.01421	0.06144	-0.23	0.818
IR	0.00211	0.00832	0.25	0.800
Constant	-0.86126	0.20028	-4.30	0.000
Log likelihood	-584.247			
No. of obs.	880			
Waldchi2 (5)	26.50			

The results presented in this table show that the opening of the capital account negatively affects the probability of banking crises. Thus, liberalization of the capital account is not the main cause of banking crises. This has been validated by Komulainen and Lukkarila (2003), which suggest that the opening of the capital account is not the cause of crises in emerging markets, but the current crisis because of these can probably be deteriorating fundamentals. This result corroborates those of Shehzad and De Haan (2009). They have actually found that some aspects of financial liberalization reduce the likelihood of systemic crises, conditional on adequate banking supervision. Eichengreen and Arteta (2002), the opening of the capital account does not contribute to a banking crisis. While the liberalization of domestic financial sector can lead to banking crises. In addition, Bonfiglioli and Mendicino (2004) have shown, following a dynamic panel study of a sample of 90 developed and developing countries, the countries that have liberalized their capital accounts are less confronted with the advent of crises that the savings bank financially repressed. Both authors justify this by the fact that economic agents appeal to international capital markets for financing in times of banking crises.

However, our results contradict those of the study by Ranciere et al. (2006), which examines the relationship between financial liberalization, financial crises and economic growth. They broke down the impact of financial deregulation on economic growth in two effects: a direct effect on growth and an indirect effect that reflects the growth costs associated with a high frequency of financial crises. They consider that financial openness does not promote the growth of the economy because of the emergence of crises. According to them, financial deregulation has a positive effect on economic growth and also increases significantly the probability of the twin crises (banking crises and currency crises). Financial control variables, the ratio "M2 / Foreign Reserves" are statistically significant and positive (+2.32). This ratio is positively related to the probability of a banking crisis. This finding has been confirmed by Cartapanis (2002). The variable "domestic credit growth" is not significant. Thus, in our study, this variable has no effect on the probability of banking crises in developing countries in line with our predictions.

The variable "economic growth" is statistically significant and negatively related to the probability of occurrence of banking crises. A decrease in the growth of the economy is strongly associated with the likelihood of the emergence of banking crises. The test results of the impact of financial liberalization on the probability of banking crises and illustrated in the following table:

Table 2. *The impact of financial liberalization on the probability of banking crises*

Variable	coefficient	Std Error	Z-statistic	P> Z
LMB	-0.12535	0.04126	-3.03	0010
M2\Reserve	0.06030	2810.02	2. 64	0.021
GDP	-0.06846	0.01871	-3.65	0.003
GDC	-0.01321	0.05134	-0.25	0.806
IR	1210.00	7120.00	0.169	0.868
Constant	-0.76126	0370.20	3.799	0.002

Log likelihood	- 611.325			
No. of obs.	880			
Waldchi2 (5)	58.36			

With LMB is the effect of market liberalization as measured by the sum of portfolio flows in equities and flows of portfolio in bonds to GDP, the probability of banking crises during the period (1990-2011) in developing countries.

The liberalization of financial markets is affected by a negative and statistically significant sign (-3.03). These results reject the null hypothesis of our study suggests that market liberalization helps to increase the probability of banking crises. The finding that the opening of financial markets exerts significant negative effects on the probability of occurrence of banking crises can be explained by the fact that the deregulation of financial markets leads to the creation of new monetary and financial instruments best suited to the management of risk (derivatives). It allows banks to diversify better the best risk and minimize their losses later.

5. Concluding Remarks

This study showed that the probability of banking crises is negatively correlated with the opening of the capital account. This has been validated by Komulainen and Lukkarila (2003) have shown that the liberalization of the capital account is not the cause of the crises, but the main reason probably lies in the deteriorating fundamentals. On the other hand, market liberalization negatively affects the frequency of banking crises in emerging countries.

On the other hand, the effect of the internal financial deregulation of financial markets and the capital account on the probability of banking crises is negligible when it is accompanied by an adequate supervisory system and a strong institutional environment.

Finally, we can conclude that the results we have reached throughout this paper show the existence of a negative relationship between external financial liberalization and banking crises. In addition, the results clearly suggest that strengthening the institutional framework could weaken the likelihood of banking crises especially in periods of financial deregulation. In other words, it tends to stimulate banking instability or if the institutional environment is fragile.

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Identification of Key Productive Sectors in the Mexican Economy

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This article focuses on identifying what are the key sectors with high potential for drag induced investment in the Mexican economy, also characterizes the sectors according to their hierarchy, impact and degree of articulation. To achieve this the input-output matrix national 2003 was used (disaggregated into 20 sectors and 79 sub-sectors), provided by the official government agency responsible for generating statistical information, which applied the traditional method of calculation of multipliers which takes into account both relations hierarchical such as circular between the productive sectors of Rasmussen (1956). The originality of the work lies in the application of the social networks theory to determine (García, Morillas and Ramos 2005, 2008): a) total effects, b) immediate effects, and c) mediative effects of sectors and thus have a full diagnosis of key sectors of the economy under study. In general, the findings indicate that for the promotion of growth and productive development, efforts should focus on manufacturing industries, which means to apply an active industrial policy.

Keywords: input-output analysis, social network theory, inter-sectorial relations, key sectors, Mexico, development, economic growth.

JEL Classification: O10, O11, O21, R11.

1. Introduction

Mexico is a developing country facing a myriad of problems, one of the most important, in economic terms, is the low rate of growth of its economy, which has had severe consequences on the ability to generate jobs and therefore income that help to improve the welfare of the population. On annual average, between 1982 and 2014 the economy, in per capita terms, barely grew 0.5%, a truly insignificant figure. Given this situation, it becomes relevant, studies that contribute to clarify the way in which the authorities could act to solve the problem.

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This paper seeks to contribute in this regard, using information contained in the matrix of national input-output for 2003 with the aim of identifying those sectors that are the most important, through their productive linkages, both forward and backward, sectors with a high potential for drag. This is vital, since before resources that normally are scarce, its use in this way should be prioritized, and thus the paper by identifying sectors of greatest relevance contributes with information for decision-makers that are focused on the promotion of economic growth.

It should be stressed that the analysis of the productive structure of an economy based on so-called inter-sectorial linkages allows to characterize the degree of interaction and dependence between productive sectors, this type of analysis provides the following advantages: a) allows you to identify what are the key sectors with high potential for investment induced drag, b) characterizes the sectors according to their hierarchy (impact and degree of articulation, and c) provides information of practical use for planning the growth and productive development.

In the paper the task of identifying key sectors from the input-output matrix is performed using as a reference the traditional works of Leontief (1936) and Rasmussen (1956), but particularly García, Morillas and Ramos (2005 and 2008). The identification is carried out with 20 sectors (1: Agriculture, forestry, and fishing; 2: Mining; 3: Electricity, water and gas; 4: Construction; 5: Manufacturing industries; 6: Commerce; 7: Transportation; 8: Post office and storage; 9: Information in mass media; 10: Financial and insurance services; 11: Real estate and rental services; 12: Professional, scientific and technological services; 13: Corporate management and business; 14: Business support services; 15: Educational services; 16: Health and social care services; 17: Recreational services; 18: Hotels, food and beverages; 19: Other services; 20: Government activities) and 79 subsectors (by extension are specified in table 3).

The paper innovates in the Mexican case making use of the Social Networks Theory (SNT), which unlike the traditional analysis, focused the study on a set of observed relationships between the actors in a network or group—for example, the structure of supply and demand of an economy—and not on the individual characteristics of the same—e.g. volume of production in a sector, final demand, value-added, etc.—. In particular, the study of the productive structure allows us to respond to the following questions: What are the key productive sectors, driving, strategic and independent in the economy derived from their production chains? What is the relative influence that has, by its position, a sector particularly on the overall economy? What is the capacity and speed of diffusion of the relative influence between elements—sectors and subsectors of activity—and particular substructures of the economic framework?

The work was structured in three parts. The first summarizes the existing literature in this regard, according to a scan performed in the electronic databases Repec, Scielo, Dialnet and Jstor. The second presents a synthesis of the methodology used, as well as the source of the data. The third part presents the results of identification of key sectors with a breakdown of 20 and 79 subsectors. Finally the findings are summarized and brief suggestions of economic policy are made for the promotion of economic growth in Mexico.

2. Literature Review

Efforts to identify key sectors of an economy based on the information provided by the input-output matrix are numerous internationally, a first work encountered was that of Meller and Marfan (1981), who studied the relevance of the small and large industry in relation to the problem of job creation in a developing country. His work examines the forward and backward linkages and identifies key sectors for the generation of employment within the Chilean industrial sector. One of his most important findings is that the sectors associated with the manufacturing of large scale are those who have a greater positive effect on employment generation, particularly: large industry-food, beverages, textiles, wood, paper, leather, and basic metals; small industry-wood, machinery except electrical, and diverse manufacturing.

On the other hand, with information from the input-output matrix of the Andalusian economy for 1980, Cuadrado and Auriolles (1984), analyzed the intersectorial relationships with a simple and conventional methodology proposed by Chenery and Watanabe (1958), from which found that there are two separate structural imbalances in this economy, and prevailing high participation of the primary activities and a reduced share of industrial activities. The identified key sectors are agribusiness, certain branches linked to the export of natural resources and construction. His work also able to determine industrial sites that rely heavily on imported components that sell most of their production abroad.

Using the SNT and the input-product matrix of the Andalusian economy, García, Morillas and Ramos (2005) calculated the total, immediate and mediative effects, finding that the productive relations are not structured around branches of high technology that is an obstacle to the spread and development of it, their work is the first encountered in the implementation of this new approach and hence its reply to the Mexican

case in this paper. These authors recognize that although manufacturing industries continue to be key in the development, increasingly charges a greater boost the role of the services associated with the knowledge economy. García, Morillas and Ramos (2008) updated its previous research with information from the Spanish economy for 71 industries and the European Union for the year 1995 with 25 branches. Unlike the previous work, now added an index of sectorial influence, so that their results suggest that Spain shows a similar performance to the European Union, with the construction sector pushing the economy and an essential industry for the whole activity. The manufacturing sector reveals the basic differences between the two territories. Spain still shows a traditional structure with an important presence of the metallurgic sector due to its history, while Europe has a better relative position in the high technological segment. On other hand, the tertiary sector presents a similar position in both economies.

In the case of the Chilean economy, Soza-Amigo (2011), identifies the products and activities that are key to the Chilean regions, forming clusters and structural similarity that exists between them. For this, used a combination of so-called Important Coefficients and Fields of Influence. Their study lets you know the productive structure of each of the regions of that country from which makes a number of recommendations for economic growth.

Hernandez (2012), using data from the Colombian economy for 2007, to which applies the method of chains and multipliers of the input-output matrix, which allows you to determine that there are strong links between sectors and sectors of petroleum, chemical, plastics, electricity and gas, transport and communications have a great influence on the demand and the supply of others. Finally, it concludes that the sectors of civil works, other services and chemicals and plastics are the greatest generators of employment in the economy.

Finally, regarding the international review, in a recent study of the Spanish economy, Cansino *et al* (2013) present the social accounting matrix corresponding to 2007 at basic prices. From this, key sectors of the economy are identified through three different methodologies: the methodology proposed by Rasmussen, hypothetical extraction method and finally the method of product matrix multiplier. The analysis of key sectors with the use of these methodologies leads to conclusions which, in some cases, are very different and contradictory.

For the Mexican case highlights the work of Fuentes and Sastré (2001) and Fuentes (2009) who performed the identification of key sectors for two subnational economies; while Sobarzo (2011), from an applied general equilibrium model reproduces an input-output model, which serves as a basis for estimating Leontief's multipliers, allowing you to perform some exercises of impact of economic policy in a context of crisis. Finally, Albornoz, Canto and Becerril (2012), carried out the estimation of the input-output matrix for a sub-national economy in southeastern Mexico from which identified key sectors and propose how to best allocate resources to those sectors with greater linkages and therefore a notorious multiplier effect resulting in increased growth. The review shows that the exercise proposed in this article fills a gap existing in the literature by applying a new methodology for the identification of key sectors of the Mexican economy.

3. Research Methodology

The information contained in the matrix of the input-output from 2003, published by the National Institute of Statistics and Geography (INEGI in spanish), was used in the estimation of key sectors of the Mexican economy in two versions: one made up of 20 sectors and the other disaggregated 79 subsectors of economic activity. The input-output matrix of Mexico that was used was constructed using the rules of the North America Industry Classification System (NAICS).

For the construction of the matrix is required to put in place a set of activities, as the concentrating, analyzing and processing of basic information from multiple sources: economic censuses, agricultural, population censuses, household income and expenditure surveys, administrative records and fundamentally national accounts.

The information that concentrates the input-output matrix has its origin in the balance of supply and aggregate demand, that consists of comparing product-by-product supply and use of goods and services available in the economy, both domestic production and imports of products and services. Figure 1 details the sources of information used by the INEGI for building national matrix.

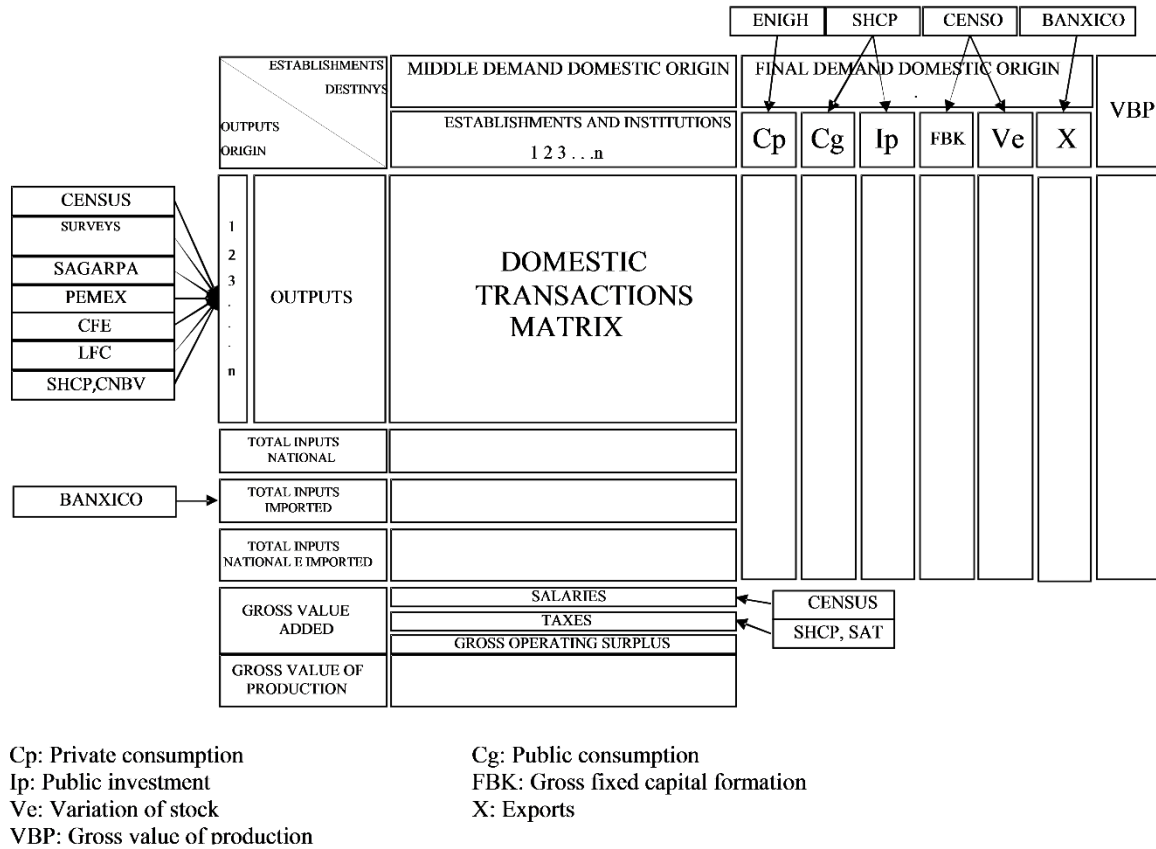


Figure 1. Sources of information to construct the input-output matrix in Mexico
 Source: Own elaboration

From the matrix, two procedures were used for estimation of key sectors, on the one hand chains of Rasmussen (R) method and the Social Networks Theory (SNT). Rasmussen (1956) posed a quantification of linkages from the inverse matrix of the input-output table. Thus, adding the columns of the inverse scattering power of a sector or the expansion of its effects on the production network is obtained. Adding rows of the same matrix gets the sensitivity of dispersion of a sector or the extent in which the sector is dragged by the expansion of the economic framework. Thus, suggests two measures based on Leontief inverse matrix to quantify the direct and indirect effects backward (BL^R) and forward (FL^R) that a may experience a sector. The normalized measurements are obtained from the following expressions:

$$BL^R = \frac{ni'(I - A)^{-1}}{i'(I - A)^{-1}i}$$

$$FL^R = \frac{n(I - A)^{-1}i}{i'(I - A)^{-1}i}$$

Thus we have (BL^R) which is known as scattering power and (FL^R) as sensitivity of dispersion. From this indicator, the activities are grouped into four types: 1) sectors with weak backward and forward linkages (independent); 2) sectors with high forward linkages and low backward linkages (driving sectors); 3) sectors with low forward linkages and high backward linkages (base sectors); and 4) sectors with strong forward and backward linkages (key sectors). Due to which these measures are sensitive to extreme values, instead of using the arithmetic means the coefficient of variation (standard deviation from the average in their classification) was used for each indicator. With respect to the limitations of this technique, see Fuentes and Sastré (2001).

Table 1. Rasmussen's (R) production chains

	BL^R < Average	BL^R > Average
FL^R > Average	II. Driving sectors	IV. Key sectors
FL^R < Average	I. Independent sectors	III. Base or strategic sectors

Source: Own elaboration

The SNT has erupted into economic science as a new tool for structural analysis based on the work developed by Bavelas (1948), Granovetter (1973), Friedkin (1991), Rauch and Castella (2001), Garcia, Morillas and Ramos (2005 and 2008), among others. This approach focuses the analysis on the set of observed relationships between actors in a network or group –for example, the structure of supply and demand in an economy– and not on the individual characteristics of the same –e.g., volume of production of a sector final demand, value added, and so on–. Similarly, the SNT allows to evaluate what are the effects generated by the central actors on the whole of the network, the speed with which an actor is related to the others and its transmission capacity of such effects.

The above is collected within the generic concept called centrality, to analyze the structural properties and the location of agents in the network. The concept determines the position of an agent in the network, either by its importance, influence, relevance or prominence. Similarly, this notion of centrality led input-output model helps to determine the relevance of a sector in the economic framework.

Following the methodology of Friedkin (1991) and Garcia, Morillas and Ramos (2008), the following indicators of centrality were used: a) total effects, b) immediate effects and c) mediative effects. These measures allow identifying the position, impact and degree of articulation presenting each of the productive sectors through the determination of the total effects exerted a sector on the whole economy, the speed with which relate to other sectors and importance as a transmitter element within the network of exchanges.

The indicator of total effects of centrality, as its name implies measuring the total effects of a sector and their relative influence on the other sectors in the economic framework, in the context of the input-output analysis global cross-sectorial effects are essentially determined by the number and length of the existing roads between sectors through specified productive relationships, this effect is captured from the following expression:

$$V = (I - \alpha A)^{-1} (1 - \alpha) = (I + \alpha A + \alpha^2 A^2 + \alpha^3 A^3 + \dots)(1 - \alpha) \quad 0 < \alpha < 1$$

In this case, V is an associated matrix from development of inversion matrix known as the method of expansion of powers, this technique captures the direct and indirect transactions, and may assert that the sector j influences globally relative to sector i , for $v_{ij} \neq 0$, being the v_{ij} the i,j -th coefficient of the matrix V ; and at the same time the parameter (α) is a weighting which allows to quantify the capacity of influence between sectors. The matrix of full cross-sectorial effects (V) meets several conditions among which we can point to that it is a stochastic matrix by rows:

$$0 \leq v_{ij} \leq 1$$

and

$$\sum_j^n v_{ij} = 1$$

Of the foregoing, the more central is the position of a sector to interact with the rest –less number of steps through which two sectors are interrelated– the greater impact of their transactions; while equal distances between sectors caused effect depends on the intensity of the relationship in (αa_{ij}).

Assuming the existence of a network of influence regular; i.e., without sectorial extreme polarization and the hypothesis that the cross-sectorial influences weighting coefficient tends to the unit ($\alpha \rightarrow 1$) the matrix V could converge to a V_u matrix defined as:

$$V_u = \begin{bmatrix} c_1 & \dots & c_n \\ \dots & \dots & \dots \\ c_1 & \dots & c_n \end{bmatrix}$$

With the characteristic that the total cross-sectorial effects j are constant, i.e., $v_{ij}=c_i$, where $(0 \leq c_i \leq 1)$ convergence of the matrix of total effects of centrality is guaranteed if and only if (for a formal demonstration see Friedkin and Johnsen, 1990):

$$V = \lim_{\alpha \rightarrow 1} (I - \alpha A)^{-1} (I - \alpha) = A^\infty = V_u$$

Such that A^∞ coincide with the matrix V_u which in turn reflects the steady state of the process (c_1, \dots, c_n) . Hence the total effect of centrality of a particular sector j in the network are listed in column j of the matrix $V=V_u$, such that the total effect of centrality ($T_{TEC(j)}$) is defined as:

$$T_{TEC(j)} = V' \Phi$$

Where T is a vector ($n \times 1$) order; $\Phi = \{1/n\}$ is a vector ($n \times 1$) order and V' is the transposed matrix V . The matrix expression is simply the average of the elements in the columns of the matrix V , in such a way that the higher this value, greater force shall in the sector totals on the overall economy.

The second measure of centrality of a sector refers to the speed of transmission of the sectorial total effects in the network, in other words, sectors whose effects are transmitted through long paths of economic relations have one smaller economic impact than those others with a high number of direct transactions. In this way, not only are seen smaller multiplier effects (Morillas, 1983), also there is a minor effect in the transmission of processes of innovation (García, Morillas and Ramos, 2008).

To formalize this measure requires two assumptions: first, the sequence of cross-cutting influence of sector j to a sector i in which the first sector appears only once, and second, take again the hypothesis that $(\alpha \rightarrow 1)$ in the context of a network of regular influence, once obtained such effects is defined influence relative of a sector j , as the average length of their economic transactions weighted sequences each of them by the force of established sectorial relations (Kemeny & Snell, 1960, p. 79, quoted in Friedkin, 1991, p. 1486).

$$M = (I - Z + EZ_{dg})D$$

Where D is a diagonal matrix with elements $d_{ii} = \{1/c_i\}$, c_i is an element of the matrix V_u ; Z the fundamental matrix defined as $Z = (I - \alpha A + A^\infty)^{-1}$; E is a unitary matrix of order $(n \times n)$; and Z_{dg} is Z setting to zero the elements outside the main diagonal.

How quickly a sector relates to which economically with others is expressed in the respective columns of the matrix M . The immediate effects ($T_{IEC(j)}$) indicator is calculated as the inverse of the average lengths of intersectorial relations (roads) a sector j -th.

$$T_{IEC(j)} = \left(\frac{\sum_{i=1}^n m_{ij}}{n} \right)^{-1}$$

In matrix is expressed as:

$$r = n\varphi$$

Where

$$\varphi = \{\varphi_j\} = \left\{ 1 / \sum_{i=1}^n m_{ij} \right\}$$

is a vector ($n \times 1$) order and m_{ij} is an element of M . From the above we have that, the greater the value of the index's immediate effects ($T_{IEC(j)}$), the greater the rapidity with which to propagate the total effects of the sector considered. It is important to note that the immediate effects of centrality or the speed of dissemination of the full effects are not considered by the traditional approach, so it is a contribution of the SNT to the structural analysis (García, Morillas and Ramos, 2008).

The third measure of centrality indicates the degree of importance that a particular sector has as the overall effects transmitter; in other words, it indicates those sectors that provide the performance and economic

interconnection. These economic sectors operate in the system as connectors and are relevant to the joint development of the economy.

The estimation of the mediative effects is obtained from the matrix M by decomposition in the number of steps from one sector j to another sector i , through several intermediate steps:

$$m_{ij} = \sum_{k=1}^n t_{(j)ik} \quad i \neq j \neq k$$

Where $t_{(k)ik}$ is the i_k generic element of the matrix T , which is defined as:

$$T_{(j)} = (I - \tilde{A}_{(j)})^{-1}$$

So $\tilde{A}_{(j)}$ is the resulting matrix of eliminating the j -th row and column of the matrix A (Kemeny and Snell, 1960 cited in García, Morillas, and Ramos, 2008). The mediative effects ($T_{MEC(j)}$) indicates the relevance of a j -th block as a transmitter for connecting the economic framework.

$$T_{MEC(j)} = \left(\frac{\sum_{k=1}^n \bar{t}_{(k)j}}{n} \right) \quad j \neq k$$

Where:

$$\bar{t}_{(k)j} = \left(\frac{\sum_{i=1}^n t_{(k)ij}}{(n-1)t_{(k)ij}} \right) \quad i \neq j$$

The effects of intermediation, indicative of the importance of a particular sector as a transmitter or as a crossroads for the economic network connection can be expressed from the definition of the matrix

$$\bar{T} = \{\bar{t}_{(k)j}\}$$

$$c = \bar{T}\phi$$

Where

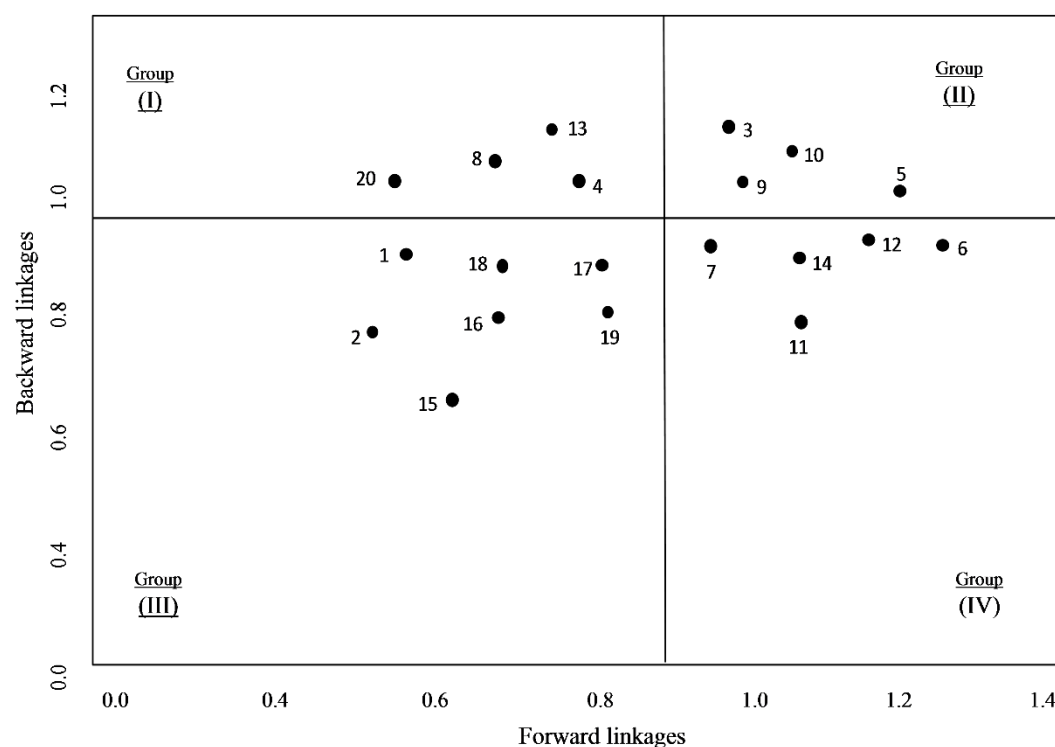
ϕ is a column vector ($n \times 1$) whose elements are $(1/n)$.

It should be added that the indicator of mediative effects to quantify the importance of intersectoral linkages effects, have similar coefficients Streit (1969) interpretation. However, the mediatives effects not only collect direct relations between the different sectors but also the indirect. Therefore it is a global indicator of the intensity of the total transactions; additionally, this indicator can clarify questions relating to the speed of diffusion of the considered total effects measuring the average length of the sequences of economic exchanges. The program Excel (hypothetical matrix), Matlab (calculation of the inverse matrix) and Netminer (social network analysis) was used for the calculations.

4. Analysis and Results

In what follows are presented the results of the application of the methods exposed to the information contained in the input-output matrix to determine the key sectors of the Mexican economy. The exercise was conducted with 20 sectors and 79 subsectors. In order to compare the results of the approach of SNT with traditional methods (Rasmussen, 1956), in the first order the sectorial management is presented from the economic weight of the relations of causality or productive backward and forward linkages.

The reason for exposing these indices is due to the advantages with regard to measures made by Chenery and Watanabe (1958), since they incorporate in estimating the effects of global chain that occur between both the supply side and the demand side, also include the effect of sectorial dispersion and weightings in the sectorial chains according to their relative importance in the final demand (Hazari, 1970). The results are presented in Graph 1.



Graph 1. Rasmussen's productive chains (R)

* Every number correspond to one sector, see the Table 2

Source: Own elaboration with information from input-output matrix at 20 sectors

From the obtained classification, group sectors base or strategic –most demanded in an economy sectors, but which in turn are plaintiffs, which are important for the cross-sectorial sales– make up sectors of commerce (6), transportation (7), real estate and rental services (11), professional, scientific and technological services (12) and business support services (14).

The group of key sectors –characterized for being strong intersectorial applicants suppliers of intermediate inputs and products, which are forced to step sectorial flows in an economy consists of the activities of electricity, water and gas (3), manufacturing industries (5) information in mass media (9) and financial and insurance services (10).

The group of drive sectors –that have few linkages forward, but which are, in general, sectors that have wide possibilities of drag and induce economic growth– includes construction (4), postal office and storage (8), corporate management and business (13) and government activities (20).

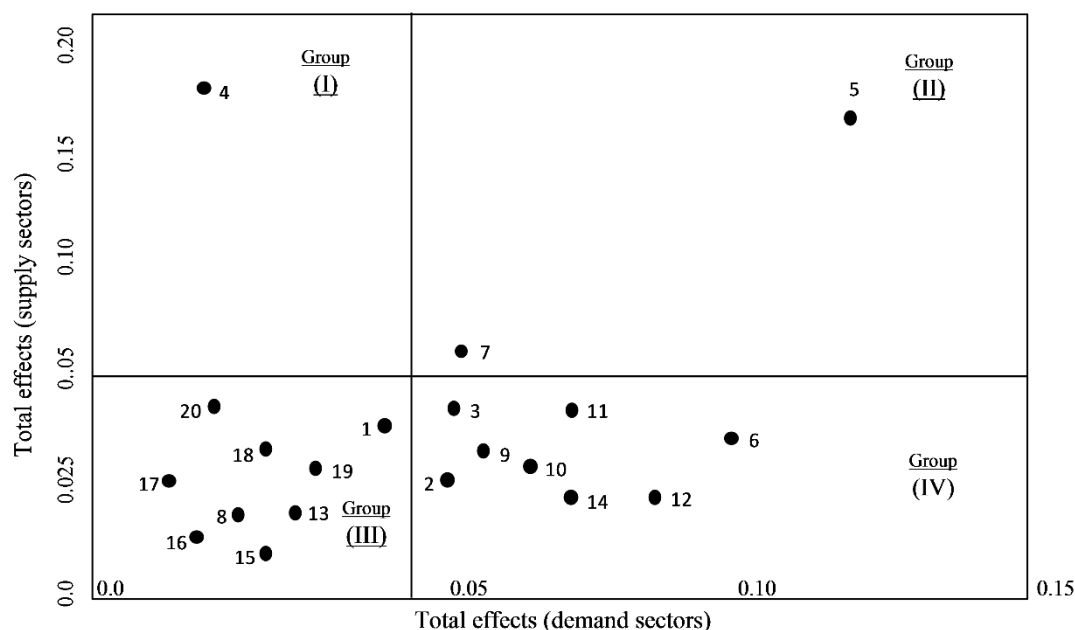
Within the group of independent or little linked with other sectors and to produce without great requirements or by other sectors –basically demanding supplies primary– have the sectors of agriculture, forestry and fishing (1), mining (2), educational services (15), health and social care services (16), recreational services (17), and other services, except government activities (19).

The above sectorial classification relating to sectorial global linkages based on the criteria of Rasmussen (1956) shows that five of them are classified as base or strategic activities, seven activities are independent, four activities are classified as drivers, and finally only four activities make up the group called key sectors.

The previous analysis is illustrative of the structural characteristics of the economic activities in terms of their chains or links with other sectors of the economy, but at the same time is incomplete, because that takes economic activities separate and depending only of the economic weight of each sector.

In an effort to complement the analysis, presents the results obtained when you enter the capacity for intersectorial influence; in other words, when we focus on the existence and intensity of cross connections from a global point of view, perspective posed by network theory. In the first order, the sectorial management based on the ability to pick intersectorial influence through rates overall effects of centrality as network theory is

presented (see Graph 2). The results were classified into four groups according to their centrality: I) semi-peripheral position, II) center position, III) peripheral position and IV) semi-central position.



Graph 2. Total effects of centrality ($T_{TEC(j)}$)

* Every number correspond to one sector, see the Table 2

Source: Own elaboration with information from input-output matrix at 20 sectors

A first difference from traditional analysis approach relates to the classification of the 20 economic activities in Mexico; only two activities have a central location; nine of them have a peripheral location; eight form the classification of semi-central location; and, finally, just one sector presented semi-peripheral localization.

Introducing weighting relative to the capacity of cross-cutting influence on the coefficients input-output, clearly presents a disturbing element that allows you to pick up the sensitivity of the sectors to its structural location within the network, an aspect not considered in the classical approach.

As it can be seen from Graph 2 the group of core sectors –which have a position of centrality in the economic network and play a key role in the intermediation of intersectorial linkages in the rest of the production set– is composed only by manufacturing industries (5) and transportation (7).

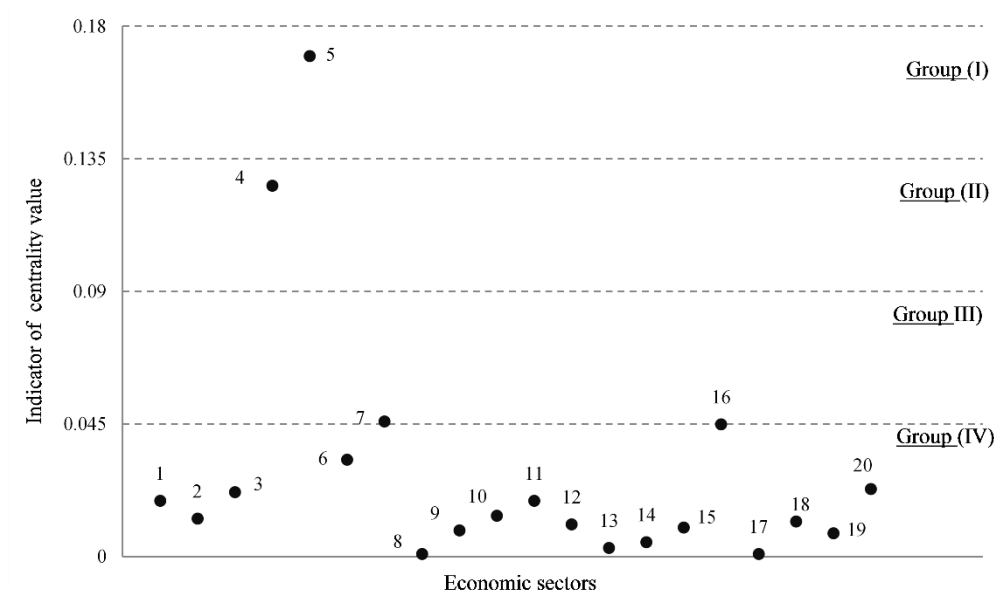
The peripheral sectors – that have a less central position and therefore, under the possible effects on the set economic network– consist of agriculture, forestry and fishing (1), corporate management and business (13), business support services (14), educational services (15), health and social care assistance (16), recreational services (17), hotels, food and beverage (18), other services except the government (19) and activities of the government (20).

The group of semi-central sectors –which are in a better position within the structure to influence– exclusively includes construction (4). Within the group of semi-peripheral sectors –which are best placed within the structure to be influenced– stand mining (2), electricity, water and gas (3), commerce (6), information in mass media (9), financial and insurance services (10), real estate and rental services (11), professional, scientific and technological services (12) and business support services (14).

As it was expected, the grouping of sectors depending on the centrality substantially change considering the capacity of intersectorial influence, appear only in this case, the manufacturing industries (5) and transportation (7) as key sectors. Moreover, by having a position of important centrality in the economic network, construction (4), manufacturing industries (5), commerce (6) and transportation (7), can transmit the total effects on the whole of the economy relatively quickly, playing an important role in the intermediation of intersectorial linkages with the rest of the productive sectors.

Continuing with the analysis, management sector now comes from the intensity of interconnections between sectors measured from the immediate effects of centrality. The sector with the greatest immediate effects of centrality is manufacturing (5) located in group I and construction (4) in group II. Followed with a wide gap sectors located in group IV which include primary activities such as agriculture, forestry and fishing

(1), mining (2), electricity, water and gas (3) secondary activities or commerce (6) and tertiary activities such as information in mass media (9), financial and insurance services (10), professional, scientific and technological services (12), educational services (15) and government activities (20), among others. In this indicator, the highlights were manufacturing industries (5) and construction (4) sectors, productive activities with greater impact and effects send all the activities of the national economy (see Graph 3).

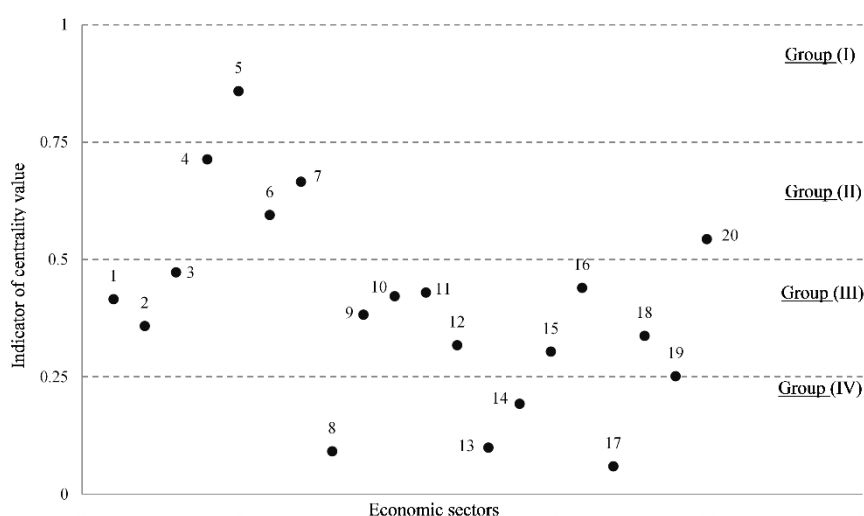


Graph 3. Immediate effects of centrality ($T_{IEC(j)}$)

* Every number correspond to one sector, see the Table 2

Source: Own elaboration with information from input-output matrix at 20 sectors

Mediative effects of centrality indicator results are presented in Graph 4. Like previous results, the analysis confirms the relevance of manufacturing industries (5) as the sector with the highest overall effect of interconnection. In the following order –above the average level– are construction (4), commerce (6), transportation (7) and government activities (20). The former sectors are characterized by their direct and indirect effects that can be transmitted to other activities are very significant.



Graph 4. Mediative effects of centrality ($T_{MEC(j)}$)

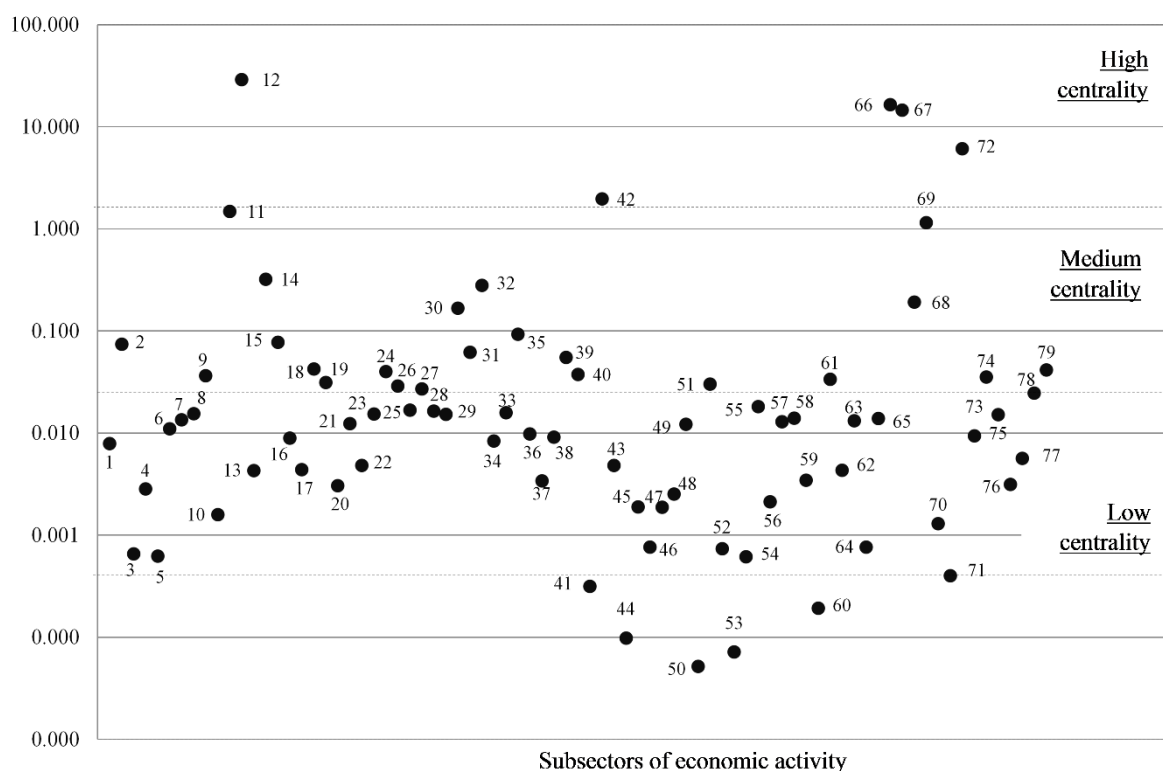
* Every number correspond to one sector, see the Table 2

Source: Own elaboration with information from input-output matrix at 20 sectors

professional, scientific and technical services (61), business support services (63), repair and maintenance services (75).

Finally, within the group of independent sectors or loosely bound to the rest and produce no major requirements from other sectors are 32 subsectors (40% of total) of the economy, this block concentrated activities mainly related to the services sector: passengers, except railway transport (40), pipeline transportation (41), postal services (44), editing publications and software, except for internet (47), creation and dissemination of content via Internet (50), central banking (54), foreign exchange trading activities and financial investment (56), business support services (63), educational services (65), consultation external and related medical services (66), residences of welfare and health care (68), artistic, sports and other related services (70), museums, historical sites, botanical and similar gardens (71), personal services (76), among others .

In this way, analysis of productive linkages to 79 sub-sectors reveals in greater detail the workings of the economy as a whole, at this level of disaggregation is possible to determine in terms of their productive connections, what are the key activities, base or strategic, independent and driving. However, it is incomplete because it takes economic activities separate and depending only of the economic weight of each subsector.



Graph 6. Total effects of centrality ($T_{TEC(i)}$)

* Every number correspond to one subsector, see the Table 3.

The centrality indicator values are presented on a logarithmic scale

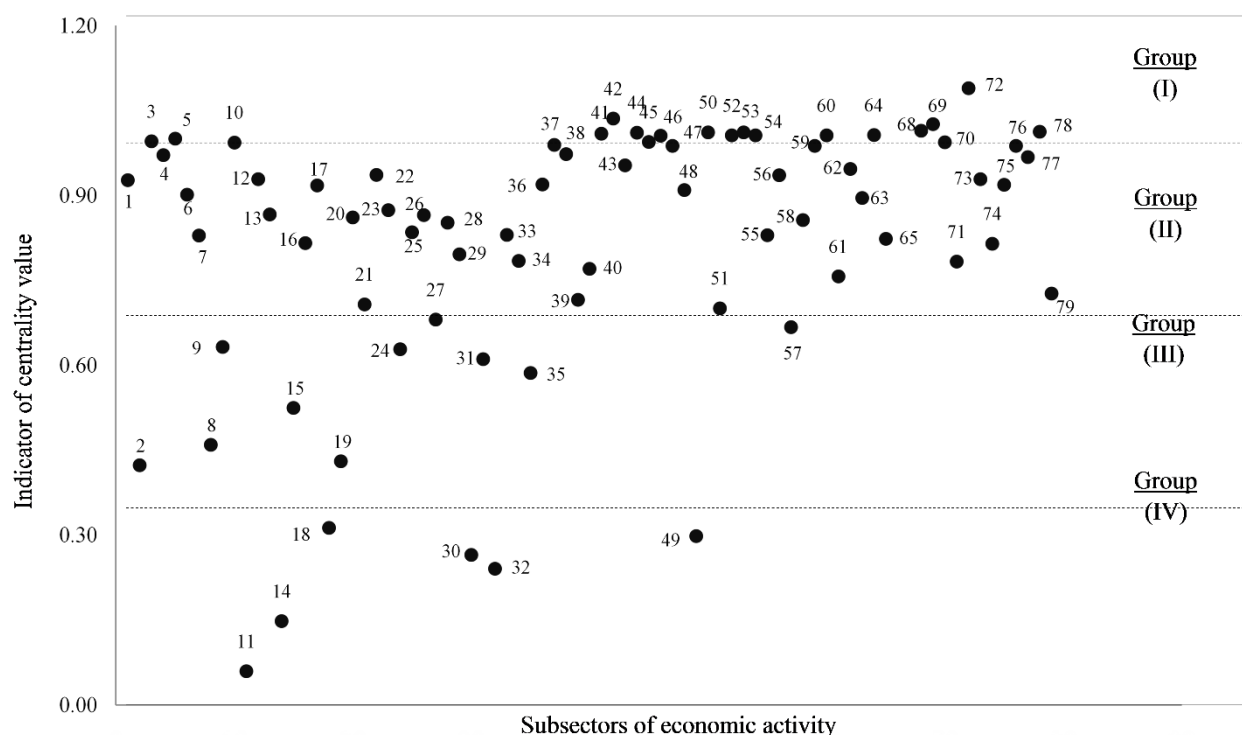
Source: Own elaboration with information from input-output matrix at 79 subsectors

In order to perform a better representation of the structure and functioning of the economy, measures of centrality based on social network theory (SNT) were calculated. As the first element of the SNT total effects (see Graph 6) centrality indices are presented. After entering the relative ability of intersectorial influence on input-output coefficients, it is possible to observe the sensitivity of the subsectors of their structural location within the network, an aspect not considered in the traditional approach of input-output analysis.

As is clear from the analysis, the group of sectors "high centrality" – that have a position of centrality in the economic network and play a key role in the intermediation of intersectorial linkages in the rest of the production set– brings together seven subsectors (9% of total) which include: building (11), construction of civil engineering works or heavy work (12), food industry (14), tourist transport (42), hospitals (67), and other welfare services (69).

In the group of "medium centrality" activities or semi-central sub-sectors –who are in a better position within the structure– are 37 subsectors (47% of the total), some of these sectors are: livestock (2), generation, transmission and supply of electricity (9), beverages and tobacco industry (15), manufacture of transport equipment (32), government activities (79), among others.

Finally, in the activities of the "low centrality" or peripherals group – which have a less central position and therefore least potential effects on economically network– they are 37 subsectors (44% of the total) and are as follows: forest harvesting (3), services related to agricultural and forestry activities (5), transportation by pipelines (41), postal services (44), creation of and dissemination of content via the internet (50), central banking (54), rental of trademarks, patents and franchises (60), and others.



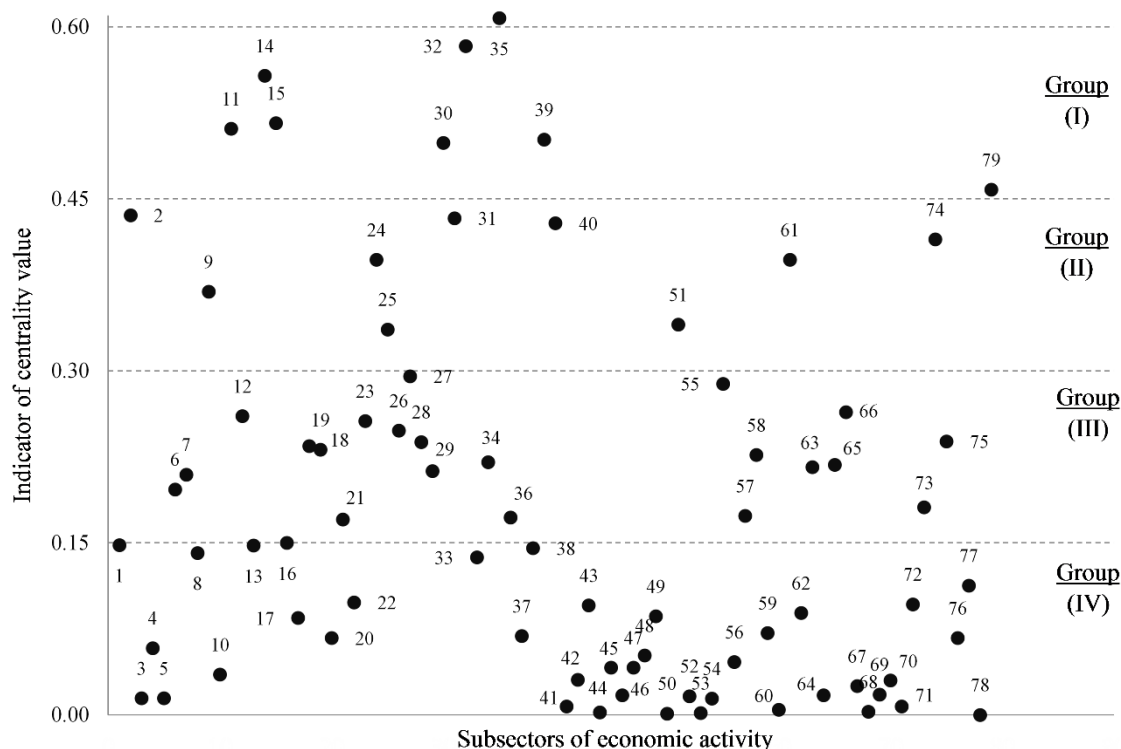
Graph 7. Immediate effects of centrality ($T_{IEC(j)}$)

* Every number correspond to one subsector, see the Table 3

Source: Own elaboration with information from input-output matrix at 79 subsectors

Continuing with the analysis, sector classification is presented in terms of the intensity of interconnections as the immediate effects of centrality (see Graph 7). Highest to lowest impact on the speed of transmission in the economic fabric shows that Group I agglomerates 25 subsectors (32% of total), the group II 29 subsectors (49% of total); Group III to nine subsectors (11% of total); and finally, the group IV to six subsectors (8% of total).

Among the sectors most direct interconnection are transport services in general: rail (37), water transport (38), pipeline transportation (41), tourist transport (42); postal services (44), courier and parcel services (45), storage services (46), providers of internet access, search services in the network and information processing (52), other information services (53); movable property rental services (59), rental of trademarks, patents and franchises (60); residences of welfare and health care (68), other welfare services (69). These subsectors are characterized by their high capacity to transmit direct effects on the total economic framework.



Graph 8. Mediative effects of centrality ($T_{MEC(j)}$)

* Every number correspond to one subsector, see the Table 3

Source: Own elaboration with information from input-output matrix at 79 subsectors

Finally, to identify the intensity of global interconnections are used to gauge mediative effects of centrality (see Graph 8). From this measure of centrality, the sub-sectors of importance for its transmitters or nodal effects for economic networking results in the following classification. The first group focuses eight subsectors (10% of total), the second group to nine subsectors (11% of total), and the third group of 21 subsectors (27% of total); finally, the fourth group 41 subsectors (52% of total). Among the sub-sectors with higher overall effects of interconnection with the rest of the economy are: building (11), food industry (14) beverages and tobacco industry (15), commerce (35), and government activities (79), among others.

An important result derived from this indicator is lower interconnection capacity of just over half of economic activities; mainly related subsectors primary industries: agriculture (1), forest harvesting (3), fishing, hunting and capture (4), services related to agricultural and forestry activities (5), mining-related services (8); service activities: tourist transport (42), transport-related services (43), postal services (44), courier and parcel services (45), radio and television, except vita the internet (49), and so on. The latter group also includes activities of the financial sector: central banking (54), no brokerage credit and financial institutions (55), foreign exchange trading activities and financial investment (56).

5. Discussion and Conclusion

Applying Rasmussen indexes at 20 sectors highlights the group of key sectors, manufacturing, electricity, water and gas supply pipelines to the final consumer, mass media information, and financial services and insurance. When the analysis is completed and arises from the point of view of the SNT, stand out, the total effects of centrality indices, those who have a central position, such as the manufacturing industry and transportation. In terms of the immediate effects of centrality, excels the manufacturing industry (again) and construction. The mediative effects of centrality emphasizes and confirms the importance of the manufacturing sector, followed by construction, commerce and transport.

The results of analysis of productive chains based on Rasmussen for the 79 sub-sectors, show that in the group of key subsectors, ten subsectors that comprise it, nine belong to the sector of manufacturing, which once again ranks as one of the most important in the economic network. By analyzing through the SNT, with indices of total effects of centrality, highlights the Group's "high centrality" subsectors, which are key in the

intermediation of intersectorial linkages, they are seven, among which is the construction, the food industry and hospitals. The immediate effects of centrality show that the sub-sectors with higher direct interconnection have related to transport by rail, by water, services and tourism; storage and postal services. Finally, the mediative effects of centrality highlights eight subsectors, including construction, food industry, beverage industry and tobacco, commerce and government activities.

From the techniques used to identify key sectors of the Mexican economy was reached results that are consistent with other studies (Sánchez, 2011, 2013, 2013a; Palacios, 2013 and Olmedo, 2014), which underline the importance of manufacturing as the engine of economic growth. The evidence presented serves as an input for the establishment of an active industrial policy that will allow to overcome the current stage of economic stagnation. In the hands of a State that intervenes creatively in key sectors, supported axis of budgetary transparency and efficient management of resources, the economy of Mexico can become one of the most dynamic of the American continent, which would translate into job creation and greater well-being for its inhabitants.

To finish, indicate that as part of the research agenda is making new estimates with the array of input-output matrix of 2008 which was published in 2013, which will help to compare our present results and know if they continue to be consistent, especially towards the implementation of an active industrial policy as a strategy for promoting economic growth.

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Appendices

Table 2. Total effects ($T_{TEC(j)}$), immediate effects ($T_{IEC(j)}$),mediative effects ($T_{MEC(j)}$), 20 sectors

Number	Sectors	Total effects		Immediate effects	Mediative effects
		TTEC(i)	TTEC(j)	TIEC(j)	TMEC(j)
1	Agriculture, forestry, and fishing	0.023	0.036	0.019	0.416
2	Mining	0.014	0.044	0.013	0.359
3	Electricity, water and gas	0.028	0.045	0.022	0.473
4	Construction	0.266	0.008	0.126	0.714
5	Manufacturing industries	0.247	0.245	0.170	0.859
6	Commerce	0.036	0.117	0.033	0.595
7	Transportation	0.051	0.054	0.046	0.666
8	Post office and storage	0.001	0.004	0.001	0.092
9	Information in mass media	0.011	0.062	0.009	0.383
10	Financial and insurance services	0.017	0.067	0.014	0.422
11	Real estate and rental services	0.019	0.084	0.019	0.430
12	Professional, scientific and technological services	0.011	0.104	0.011	0.318
13	Corporate management and business	0.003	0.017	0.003	0.100
14	Business support services	0.006	0.079	0.005	0.193
15	Educational services	0.010	0.001	0.010	0.304
16	Health and social care services	0.030	0.032	0.005	0.145
17	Recreational services	0.001	0.001	0.001	0.060
18	Hotels, food and beverage	0.012	0.0140	0.012	0.338
19	Other services	0.008	0.0232	0.008	0.252
20	Government activities	0.025	0.0027	0.023	0.544

Source: Own elaboration with information from input-output matrix at 20 sectors.

Table 3. Total effects ($T_{TEC(j)}$), immediate effects ($T_{IEC(j)}$), mediative effects ($T_{MEC(j)}$), 79 subsectors

No.	Subsectors of economic activity	Total effects		Immediate effects	Mediative effects
		TTEC(i)	TTEC(j)	TIEC(j)	TMEC(j)
1	Agriculture	0.000	0.026	0.928	0.148
2	Livestock	0.001	0.039	0.424	0.436
3	Forest harvesting	0.000	0.052	0.996	0.014
4	Fishing, hunting, and capture	0.000	0.064	0.972	0.058
5	Services related to agricultural and forestry activities	0.000	0.077	1.001	0.014
6	Oil and gas extraction	0.000	0.090	0.902	0.197
7	Mining of metal ores, except oil and gas	0.000	0.103	0.830	0.210
8	Mining-related services	0.000	0.116	0.460	0.141
9	Generation, transmission and supply of electricity	0.000	0.129	0.633	0.369
10	Water and supply of gas by pipeline to the final consumer	0.000	0.141	0.994	0.035
11	Building	0.019	0.154	0.060	0.511
12	Construction of civil engineering works or heavy work	0.373	0.155	0.929	0.261
13	Specialized construction works	0.000	0.180	0.867	0.148
14	Food industry	0.004	0.193	0.149	0.557
15	Beverages and tobacco industry	0.001	0.205	0.525	0.516
16	Manufacture of textile inputs	0.000	0.218	0.816	0.150
17	Manufacture of textile products, except apparel	0.000	0.231	0.919	0.085
18	Manufacture of garments	0.001	0.244	0.313	0.234
19	Manufacture of products of leather, leather except apparel	0.000	0.257	0.431	0.231
20	Wood industry	0.000	0.270	0.862	0.067
21	Paper industry	0.000	0.282	0.708	0.171
22	Printing and allied industries	0.000	0.295	0.937	0.098
23	Petroleum and coal products manufacturing	0.000	0.308	0.875	0.256
24	Chemical industry	0.001	0.321	0.629	0.397
25	Plastic and rubber industry	0.000	0.334	0.836	0.336
26	Manufacture of non-metallic mineral products	0.000	0.346	0.866	0.248
27	Basic metal industries	0.000	0.359	0.681	0.295
28	Manufacture of metal products	0.000	0.372	0.853	0.238
29	Manufacture of machinery and equipment	0.000	0.385	0.797	0.213
30	Manufacturing equipment of computing, common, measurement and other equipment, components and electronic accessories	0.002	0.398	0.266	0.499
31	Manufacture of equipment of power generation, equipment and electrical accessories	0.001	0.411	0.612	0.433
32	Manufacture of transport equipment	0.004	0.423	0.241	0.583
33	Manufacture of furniture and related products	0.000	0.436	0.831	0.137
34	Other manufacturing industries	0.000	0.449	0.785	0.220
35	Commerce	0.001	0.462	0.587	0.608
36	Air transport	0.000	0.475	0.920	0.172
37	Transport by rail	0.000	0.487	0.990	0.069
38	Water transport	0.000	0.500	0.974	0.145
39	Freight trucking	0.001	0.513	0.716	0.502
40	Passengers, except railway transport	0.000	0.526	0.771	0.429
41	Pipeline	0.000	0.539	1.010	0.007
42	Tourist transport	0.025	0.539	1.037	0.031
43	Transport-related services	0.000	0.564	0.954	0.095
44	Postal services	0.000	0.577	1.012	0.002
45	Courier and parcel services	0.000	0.590	0.995	0.041
46	Storage services	0.000	0.603	1.007	0.017
47	Editing publications and software, except for Internet	0.000	0.616	0.988	0.041
48	Industry film and video, and sound industry	0.000	0.629	0.910	0.052
49	Radio and television, except via the Internet	0.000	0.641	0.299	0.086
50	Creation and dissemination of content via the Internet	0.000	0.654	1.012	0.001
51	Telecommunications	0.000	0.667	0.701	0.340
52	Providers of Internet access, search services in the network and information processing	0.000	0.680	1.007	0.016
53	Other information services	0.000	0.693	1.012	0.002
54	Central banking	0.000	0.705	1.007	0.014

No.	Subsectors of economic activity	Total effects		Immediate effects	Mediative effects
		TTEC(i)	TTEC(j)	TIEC(j)	TMEC(j)
55	No brokerage credit and financial institutions	0.000	0.718	0.830	0.289
56	Foreign exchange trading activities and financial investment	0.000	0.731	0.936	0.046
57	Bonding, insurance and pensions	0.000	0.744	0.668	0.174
58	Real estate services	0.000	0.757	0.857	0.227
59	Movable property rental services	0.000	0.770	0.988	0.071
60	Rental of trademarks, patents and franchises	0.000	0.782	1.007	0.005
61	Professional, scientific and technical services	0.000	0.795	0.758	0.397
62	Corporate management and business	0.000	0.808	0.947	0.089
63	Business support services	0.000	0.821	0.897	0.216
64	Management of wastes and remediation services	0.000	0.834	1.007	0.017
65	Educational services	0.000	0.846	0.824	0.218
66	Consultation external and related medical services	0.212	0.846	1.257	0.264
67	Hospitals	0.187	0.859	1.210	0.025
68	Residences of welfare and health care	0.002	0.872	1.015	0.003
69	Other welfare services	0.015	0.885	1.027	0.018
70	Artistic, sports and other related services	0.000	0.911	0.995	0.030
71	Museums, historical sites, botanical and similar gardens	0.000	0.923	0.784	0.007
72	Entertainment recreational institutions and other services	0.078	0.923	1.090	0.096
73	Temporary accommodation services	0.000	0.949	0.929	0.181
74	Food and beverage preparation services	0.000	0.962	0.816	0.415
75	Repair and maintenance services	0.000	0.975	0.920	0.239
76	Personal services	0.000	0.987	0.988	0.067
77	Associations and organizations	0.000	1.000	0.969	0.113
78	Households with household employees	0.000	1.000	1.013	0.000
79	Government activities	0.001	1.026	0.727	0.458

Source: Own elaboration with information from input-output matrix at 79 subsectors.



Macroeconomic Analysis and Graphical Interpretation of Azerbaijan Economy in 1991-2012

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The aim of this research is to analyze macroeconomic performance and discuss transition indicators in Azerbaijan economy for 1991-2012. After regaining independence in 1991, Azerbaijan implemented economic transition process toward market economy. In the first years of independence, serious economic recession was observed. However, after 1995, the restructuring of the economy started. In this sense, signing the "Contract of the Century" was a turning point toward oil based high speed economic growth or oil boom period. Thus, by opening "Baku-Tbilisi-Ceyhan" pipeline in 2005, Azerbaijan's macroeconomic indicators experienced considerable growth for the following years. On the other hand, Azerbaijan officially declared the end of economic transition process in its economy in 2009. In this paper, the authors discuss the political-economic and economic process in the whole period as well as analyze the macroeconomic performance with and without oil & gas contribution. In addition, the authors question what would happen if economic transition period ended in Azerbaijan's economy. It is concluded that oil & gas production has a serious impact over macroeconomic indicators and transition indicators, and for Azerbaijan it implies only a partly end of economic transition, though not completely.

Keywords: Azerbaijan economy, macroeconomic analysis, oil and gas, economic transition

JEL Classification: O11

1. Macroeconomic Analysis in Historical Context

1.1. Recession Period: 1991-1994

The first years of independence had been much difficult for the Republic of Azerbaijan from both political and economic sides. More precisely, economic problems were mainly the result of political changes in the country. Thus, the years 1991-1994 are named as the first period, recession period or regress period in economic development of Azerbaijan by different researchers. Unfortunately, this period of Azerbaijan's

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economy has not been studied separately through identifying all causes of the economic decline. Prior to independence, Azerbaijan was a part of the Soviet Union until 1991. During this period, the economic system of the country was centrally planned (CPE). After regaining its independence, Azerbaijan targeted to transform its economic system toward market economy which required privatization and liberalization in all fields of the economy. However, Azerbaijan faced serious political and economic recession during the initial years of the independence.

In time of Soviet Union (SU), country's economic system was designed for the strategic requirements of the SU (Soyak and Nesirova, 2003, p. 3). Cultivation of lands was done collectively within massive production cooperatives and state farms which everything was under the control of administration (Lerman, 2000, p. 96). Despite of the independence, CPE still preserved its power in the economy within the first period. Privatization could not be started because of political instability and ongoing war with Armenia. Moreover, the president of Azerbaijan was changed three times during the first three years of independence. The Communist party was still in the administration and the first president of Azerbaijan (Ayaz Mutaibov) was "dependent" to the central government. He was unresponsive to the national problems and following Russia oriented policies (Yunusov, 2001, p. 62).

However, under the leadership of Abulfaz Elchibey or the Azerbaijan Popular Front Party (APF) after May 1992, the country's policy changed toward "nationalistic" Turkish oriented foreign policy which worsened conditions of the country in terms of economic pressure, done by Russia and Iran (Ismailzade, 2005, p. 2). In brief, the ongoing war between Azerbaijan and Armenia, loss of territories, refugee and IDPs issue, instability of political regimes, transportation "embargo" of Russia, Chechen war and other political reasons caused a deepening of the economic crisis during this period of the transition (Kaynak and Nasirova, 2005, p. 40).

Moreover, collapse of Soviet Union caused the destruction of economic ties with other post-Soviet countries, loss of country's shares in those markets and unavailability of subsidies from the central government (Suleymanov, 2008, p. 171). In addition, collapse of the "inter-republican trade arrangements" and delays in "interrepublican payments systems" also led to the decline in production (Taymas, 1993).

According to Table 1, GDP of 1990 was approximately 2.67 times more than GDP volume of 1994. GDP's growth rate in the first year of independence was negative, but not at a significant level. However, GDP had contracted 21.8% in average in the other years of this period. Thus, added value in sectors of the economy in 1995 had decreased sharply in comparison to the corresponding indicators of 1990. Thus, agriculture was just 32.7% of the 1990 and respectively, manufacturing-77.5%, industry-64.5% and services-64.3%. On the other hand, total volume of export had decreased more than 2.32 times in 1994 in comparison to the 1992 of \$1.484 billion (\$730 mln inter-republic and \$754 mln extra-republic export), mostly due to the decrease in export of oil & gas and petroleum products (World Bank, 1995, p. 78).

Table 1. Change in main macroeconomic indicators: 1990-1994

Indicators	Years	1990	1991	1992	1993	1994
GDP (mln. USD)		8858.006	8792.366	4991.350	3973.027	3313.739
GDP growth (%)		-	-0.7	-22.6	-23.1	-19.7
Inflation (%)		-	-	46.2	1128	1662.2

Source: World Bank Database

Hyperinflation as the common issue of this period in most transition countries was observed in Azerbaijan also in the following years of price liberalization, 1992. Although the inflation rate was 46.2% in 1992, it sharply increased to four digit numbers such as the 1662.2% in 1994. And the main cause of hyperinflation was compensation of budget deficits through money printing by Central Bank of the country (Kaynak, Nasirova, 2008, p. 41).

In 1993, a new president came to the government. After the regime change, the priority became to achieve the political stability and authority of central government over all events within Azerbaijan, under the control of new president - HeydarAliyev. In this context, Azerbaijan and Armenia signed the cease-fire agreement in May 1994 which increased attractiveness of the country for the FDIs. Moreover, Azerbaijan invited foreign oil companies to invest to its oil sector that resulted by signing of the "Contract of Century" on 20th September, 1994. This contract was valued as \$60 billion, including 33 companies of 15 different countries which enhanced Azerbaijan's place in FDI performance index to the top in following years (Bayulgen, 2003, p. 209).

1.2. Restructuring Period: 1995-2005

The main target of the government after 1995 was to restructure the destructed economy with the effect of recession. Most of the scholars consider this period as lasted until 2003 because of the presidency change and new economic program toward social-economic development of Azerbaijan's regions. However, I suggest analyzing of this period until the end of 2005 which is the year of opening Baku-Tbilisi-Ceyhan pipeline. In addition, 2005 is the turning point in Azerbaijan's economic development toward high speed economic growth and huge positive balance in current account.

Azerbaijan started to implement radical economic policies in 1995 in collaboration with IMF under its comprehensive stabilization program due to prevent the hyperinflation issue (Baranick and Salayeva, 2005, p. 213). As a result, application of exchange rate based orthodox programs became very successful in Azerbaijan to reduce the inflation to one digit level within a short time period (Dabrowski, 2003, p. 17). At the same time, Azerbaijan accomplished to get credits from IMF only after implementation of IMF supported stabilization programs, in amount of \$219 million in December 20, 1996, especially for structural reforms (IMF, 1997, December).

In addition, adoption of Azerbaijan's constitution in November 12, 1995 was also significant event in terms of establishing juristic base for economic activities. Azerbaijan developed its cooperation with the World Bank and other international organizations that speeded restructuring of the economy as well. Thus, 31 World Bank projects with the value of \$726.72 mln in total had been carried out in Azerbaijan within this period of the transition (World Bank, 2013). However, occupation of 20% of its territory, the refugee and IDPs issue were still essential obstacles to restructuring of the economy. Thus, the country had lost a significant part of production potential as well as faced with additional unemployment issue in terms of refugees and IDPs.

Table 2. Change in main macroeconomic indicators: 1995-2005

	GDP (mln \$)	GDP growth (%)	Inflation (%)	Current account balance (% of GDP)
1995	3052.4	-11.8	411.75	-13.12
1996	3176.7	1.3	19.79	-29.31
1997	3962.7	5.8	3.67	-23.11
1998	4446.4	10	-0.77	-30.69
1999	4581.2	7.4	-8.52	-13.09
2000	5272.6	11.1	1.80	-3.19
2001	5707.6	9.9	1.54	-0.91
2002	6236.0	10.6	2.77	-12.32
2003	7275.7	11.2	2.23	-27.77
2004	8680.5	10.2	6.70	-29.83
2005	13245.4	26.4	9.67	1.26

Source: World Bank, World Development Indicators

Oil industry was restructured within the "Contract of Century" in corporation with foreign oil companies. After achieving the stability, government launched reforms in economy toward establishing market economic system which required policy changes in macroeconomic stabilization, price and trade liberalization, privatization, supporting of new entrepreneurs, and development of a supportive juristic base (Aslund and Boone, and Johnson, 1996, p. 251). In context of such economic policies, government implemented reforms in agriculture such as distribution of land among private sector and privatization the property of old "Sovhozes" and "Kolhoses" (Thomas, 2006, p. 228).

However, the land area was distributed among households rather than establishing cooperatives in privatization process. In 2002, 96% of "cultivated land" and 98% of "livestock inventories" were divided among individual farms and 80% of them did farming by themselves, just 1/10 of total land was leased to others (Dudwick et al., 2007, p. 34). This kind of privatization and farming prevented establishment of cooperatives in agriculture which is required for the better performance in international competition.

In 1995, the parliament of Azerbaijan adopted the privatization program offered by the president which aimed to privatize 70% of state enterprises (World Bank, 2008, p. 15). Initially, small enterprises and later medium and large ones would be privatized by applying the voucher privatization method (World Bank, 2008,

p. 15). Vouchers were distributed among Azerbaijani people that someone would buy them in order to privatize a state enterprise. According to the *Transition Report 2005* of EBRD, the private sector in Azerbaijan's GDP for the mid of 2005 accounted for 60%. In addition, Azerbaijan's transition indicator scores (measurement between "1" and "4+") for 2005 became "2" in large-state privatization and competition policy, "4-" in small-state privatization, "4" in price liberalization and trade & foreign exchange system (EBRD, 2005, pp. 3-4).

As a result of economic reforms and attracting FDIs to the oil sector of Azerbaijan, recession period was ended and positive economic growth (out of 1995) was observed. This represents itself in the economic indicators of that time as well. According to table 2, GDP had increased approximately 3 times in 2004 and 4 times in 2005 in comparison with the GDP of 1995. The inflation rate decreased to 411% in 1995 from 1662% of the previous year. It decreased gradually until 2001, and even deflation was observed in 1998 and 1999.

As a result of liberalization in trade, the volume of import always exceeded the amount of export during this period. The proportion of current account deficit to GDP had been serious until 1998 or obtaining the first oil within "the Contract of the Century". However, this proportion had increased again after 2001, mainly because of the lower oil prices in world market that oil was the most important good in country's export. Moreover, the oil contract and implementation of economic reforms enhanced the attractiveness of Azerbaijan for FDIs.

In addition, according to World Bank Database, the added value had increased 1.57 times in agriculture, 2.44 times in manufacturing, 8.22 times in industry, and 2.94 times in services in 2005 in comparison with 1995. However, the share of sectors in GDP had changed against agriculture (2.75 times), manufacturing (1.78 times) and services (1.32 times). In contrast, the share of industry in GDP had increased 1.89 times within the same time period mainly as a result of the increase in oil & gas production. Thus, the share of oil & gas had been 42.2% in GDP, 75% in industry, 86.5% in total export and 94.2% in FDIs in 2005 (Ciarreta and Nasirov, 2012, p. 283).

After the 2003 elections for presidency of Azerbaijan, new president – Ilham Aliyev came to the head of the government. He promised to create 600.000 new jobs within the next 5 years which were approximately accomplished (Escudero, 2009, p. 10). In addition, the "State Program on Social-Economic Development of the Regions of Azerbaijan Republic for 2004-2008" was adopted which targeted to decrease the social-economic development gap among the regions of Azerbaijan as much as possible through supporting the regional developments, encouraging major sectors of the regions, producing of export-oriented products, ensuring new job opportunities etc. (SPSEDR, 2004, pp. 3-4). Therefore, the new trend in historical development of Azerbaijan economy was not so far, especially related to the construction and opening of Baku-Tbilisi-Ceyhan pipeline as well as sharp increase in oil production under "the Contract of the Century".

1.3. Oil Boom Period: After 2005

Oil industry is not new for Azerbaijan economy that country was the biggest producer of oil in the early twentieth century. In addition, Azerbaijan's rank in oil production through modern drilling equipment was at first in the 19th century (Smith, 2001, p. 28). Although Azerbaijan started to produce its oil independently after the collapse of Soviet Union, there were significant problems in transportation and delivering of Azerbaijan oil to the world markets. That is why the oil boom in Azerbaijan started after opening of BTC pipeline that solved the issue we mentioned above. This pipeline was constructed to deliver Azerbaijan's oil to the Ceyhan seaport of Turkey through Georgia with 1760 km length and 1 million barrel/day export capacity (Cornell and Ismailzade, 2005, p. 61). In addition, the Baku-Tbilisi-Erzurum (BTE) gas pipeline was constructed within 2004-2007 in order to deliver Azerbaijan's gas to Turkish and world market with 30 billion cubic meters gas export capacity (Aras and Suleymanov, 2012, p. 228).

Opening of BTC pipeline in 2005 sharply increased the oil production and exportation which means huge revenues from oil which substantially changed the structure of the country's economy. Thus, oil production had been above 42 million tons after 2007 and even exceeded 50 billion tons in 2009 and 2010 but, in the subsequent years, production level fell and became 43 million tons in 2012 (SOCAR, 2013). As a result, Azerbaijan's GDP grew 34.5% in 2006 and 25.05% in 2007. However, GDP growth slowed after 2007 which become just 1% in 2011 because of the decline in oil production. Despite of the decline, Azerbaijan's economy grew 4.45% in 2012.

Table 3. Change in main macroeconomic indicators: 2006-2012

	GDP (mln \$)	GDP growth (%)	Inflation (%)	Current account balance (% of GDP)

2006	20982.3	34.5	8.37	17.67
2007	33049.4	25.05	16.6	27.3
2008	48852.5	10.8	20.8	33.7
2009	44291.5	9.3	1.4	22.97
2010	52906.0	5	5.86	28.43
2011	63403.7	1	7.85	27.04
2012	67197.7	4.45	1.06	22.3

Source: World Bank, World Development Indicators

This period is also characterized by the raise of the importance of inflation issue in the country. Thus, the inflation increased and became in two digit numbers for the first time after 1996 which was the result of high-speed economic growth or over-heating of the economy associated with oil production. Revenues of the State Oil Fund of Azerbaijan Republic (SOFAZ) which was established to accumulate the revenues from oil & gas production became \$66.3 billion within 2001-2011, from which \$64.1 billion had been gained within 2005-2011 (SOFAZ, 2011, p. 11). Moreover, it is predicted to become \$200 billion until 2024 (Ciarreta and Nasirov, 2012, p. 282). Consequently, the huge amount of oil revenues led to the sharp increase in state budget or government expenditures through transfers from SOFAZ which raised the amount of national currency (*manat*) in circulation.

In fact, the expenditures of state budget increased 7.2 times in comparison with 2005 from which transfers from SOFAZ consisted of 42.5% or \$24,800.0mln of total sum of stated budget expenditures (\$58,317.8mln) within 2006-2011 (SOFAZ, 2011, p. 19). In addition, approximately 15% of state budget's own revenues were also related with oil and non-oil fiscal deficit became 32% of GDP in 2012 (Boyarchuk, 2012, p. 2). As a result of sharp increase in oil export, current account balance became positive, even 33.7% of GDP in 2008 which, the share of oil & gas in gross export had been more than 90% within 2006-2009 (Ciarreta and Nasirov, 2012, p. 283).

Distribution of value added GDP among sectors of the economy is also at the center of interest. According world development indicators (World Bank, 2013), the value added GDP, agriculture, industry and services become respectively 5.07, 3.2, 5.12 and 5.6 times of 2005 in 2011. Moreover, slight change was observed in proportional share of sectors in the country's GDP. Thus, the share of agriculture in value added GDP had decreased approximately from 9% in 2005 to 5.7% in 2012. In contrast, the share of services has increased nearly from 24.4% in 2005 to 27.2% in 2012. The change in share of industry is very little (less than one percent) but, it still dominates in the economy with 59.4% share in GDP.

Despite of high level of economic growth, there are still some crucial problems such as high level of oil dependence, economic diversification and less development of export oriented sectors of the economy. In addition, there is a misbalance of distribution of labor force and GDP production among sectors of the economy as well as difference in labor force earnings regard to this misbalance. Thus, only 1% of the total labor force is employed in oil and gas industries and 50% in agriculture (Ciarreta and Nasirov, 2012, p. 283). This implies that 50% of total labor force produces very small share (5.7%) of GDP while 1% does a significant part. Obviously, this is embodied in salary of workers in different sectors as well.

2. Graphical Interpretation

Here, we will graphically discuss the trend in GDP and its components after the end of economic recession, 1994. We analyze the changes in GDP and GDP components of Azerbaijan economy in two ways: including and excluding contribution of oil & gas sector to the GDP, industry and export of the country.

Figure 1 indicates the value of GDP and GDP components in USD which embodies the impact of oil & gas sector as well. From the graph, it is clear that not a substantial change was observed in both GDP trend and trends in its components until 2004. However, because of opening the Baku-Tbilisi-Ceyhan (BTC) pipeline in May 2005, sharp increase in both GDP and industry sector was seen until 2008. Increasing of oil prices has also affected positively GDP value and industrial production. Thus, oil price for per barrel increased from \$50 in 2007 to \$140 in summer of 2008 which fell to \$40 at the end of the same year (Smith, 2009). That is why Azerbaijan's GDP raised approximately \$16 billion in 2008 which was mainly sourced from the increase in industrial, more precisely oil production. However, a decrease in GDP and industrial production was observed in 2009 as a result of sharp fall in oil prices and 2008 Financial Crises in the world economy. After 2009, the amount of both GDP and industrial production significantly increased. Nevertheless, industrial production decreased slightly after 2011 mainly because of the fall in amount of oil production.

On the other hand, no volatility was observed in amount of both agricultural and service production during the whole period. Thus, the change in agriculture sector has been very small in comparison with the GDP growth. However, added value in the service sector has also substantially risen as parallel to the increase in GDP after 2005. Hence, added value in the service sector has exceeded \$18 billion in 2012 which is 5.6 times the corresponding value in 2005. The export trend is almost on the same line with industry trend because of the oil factor. The country has also had an increasing import trend, especially after 2005 (which only declined in 2009). Very huge trade surplus was observed after 2005 which reached \$20 billion in 2008 and \$22 billion in 2012, mainly because of the oil export.

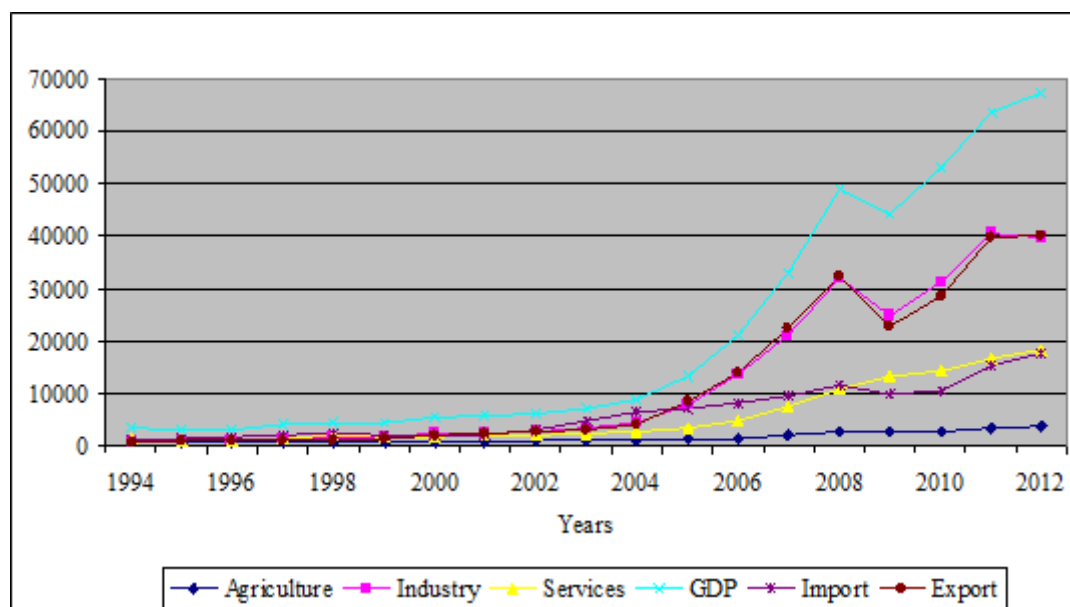


Figure 1. Trends in Azerbaijan Economy, millions USD

Although Azerbaijan's economy was characterized with high speed economic growth until recent years, the growth itself has been at the center of discussions along the period, especially after 2005 in terms of the dependency to the oil sector. In Figure 2, we attempted to analyze GDP, industry and export trends in Azerbaijan economy, with and without contribution of oil & gas. Comparative trends indicate that normal and non-oil & gas GDP do not differ so much until 2005. However, sharp increase in oil production after 2005 has led to the expansion of the gap. In 2008, the gap exceeded \$25 billion which achieved \$31 billion in 2011. This was represented in industrial production (mining industry) and exports of the country as well.

The gap between industrial production with and without oil & gas also significantly increased after 2005 which became \$26 billion in 2008 and \$30 billion in 2011. As a result, the share of oil & gas production in industry has been 70-80% which is considerably high. In export, the situation is much more crucial. Thus, share of oil and gas in total export has registered over 70% after 2000 and between 82-91% in 2005-2011. Nevertheless, all these aspects were already expected in context of the "Contract of the Century" many years ago. A more important question is what kind of non-oil & gas trends were observed within this period. According to Figure 2, non-oil & gas GDP has also grew substantially after 2005. Thus, its value in 2012 was 5 times than that of 2005. Approximately the same result is also observed in the change in value of non-oil & gas industry within 2005-2012. Moreover, total volume of non-oil-and-gas export has also increased 6.7 times (2012) in comparison with 2005.

On the other hand, the amount of gross capital formation or gross domestic investments has had an upward trend during almost the whole period. According to World Bank Database, yearly gross capital formation had increased from \$0.5 billion in 1994 to \$5.5 billion in 2005 and nearly \$13 billion in 2012. Moreover, the positive trend in net FDI flow to the country was also observed during the period. Thus, net FDI flow had risen from less than \$93 million to approximately \$4.5 billion in 2005 and \$5.3 billion in 2012. However, positive trends in Azerbaijan economy were accompanied with the increasing of external debt stocks of the country. Thus, Azerbaijan's external debt reached \$2.2 billion in 2005 and \$7.6 billion in 2012.

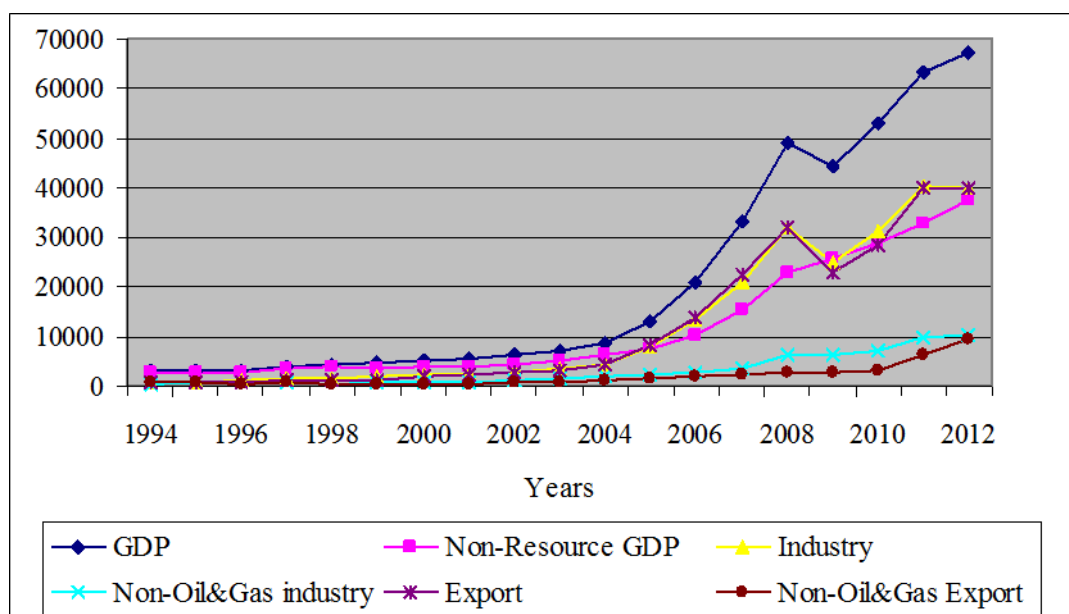


Figure 2. Comparative trends in Azerbaijan's GDP and GDP components, millions USD

All non-oil & gas trends have a slow-speed increasing tendency during the whole period. This proves that non-oil & gas sector did not decline in parallel with oil production. However, this should not be considered as that other sectors have not been affected by sharp increase in oil production and following huge revenues. Nevertheless, any research about Azerbaijan economy should take into consideration the occupation fact of its 1/5th territory and living in military conditions.

3. Transition to Market Economy

After the collapse of SU, Azerbaijan left the centrally planned economic system and launched a process toward market economy. However the transition speed was very low in the initial years of independence due to economic recession and political uncertainty as well as war conditions. When ceasefire appeared between Azerbaijan and Armenia, the country initiated the process of mass privatization of state property and liberalization of the economy. This process took a long time. Only in 2009, the president of Azerbaijan, Ilham Aliyev officially declared that the economic transition of Azerbaijan's economy had ended.

In this sense, it is important to mention what embodies economic transition. Each year, European Bank for Reconstruction and Development (EBRD) publishes transition indicators for every transition country. Despite of officially declaring the end of the transition process, such indicators have been calculated for Azerbaijan as well. Thus, EBRD's transition indicators are categorized as "large scale privatization", "small scale privatization", "governance and enterprise restructuring", "price liberalization", "trade & forex system", and "competition policy" which was valued on the basis of 4+ (EBRD).

Below, Figure 3 represents gradual transition indicators until 2012. According to the table, only price liberalization and trade & forex system has gained almost the highest transition indicator value. Small scale privatization also could be considered as successful with a 3.7 transition indicator value after 2002. However, the transition indicators for the remaining categories (governance and enterprise restructuring, large scale privatization, and competition policy) has never exceeded two and did not increase after 2003. Note that, EBRD has decreased the transition indicators' value for the competition policy category from 2 to 1.7 in 2011 and 2012, respectively.

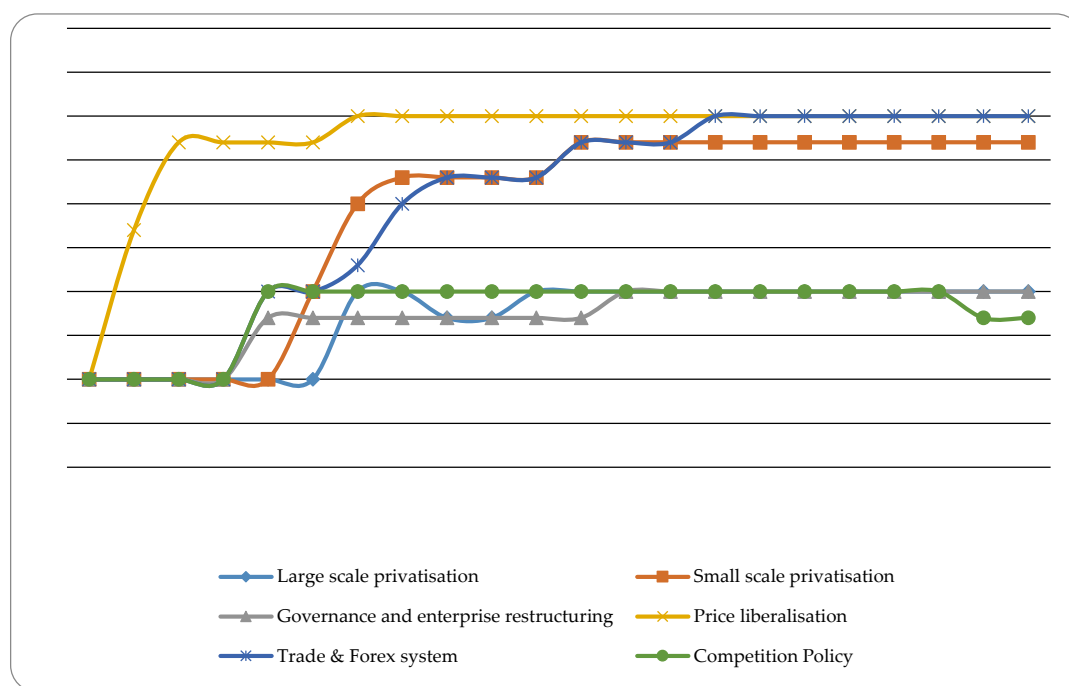


Figure 3. EBRD transition indicators for Azerbaijan, 1991-2012

On the other hand, the Index of Economic Freedom for all countries and various regions are calculated and published by the Heritage Foundation and Wall Street Journal, which is used as a measure for decentralization in empirical researches related to transition economies. Based on a 100 score measure, the overall score of the Index of Economic Freedom in Azerbaijan economy has never exceeded 58.9 which means *mostly unfree*. The score differs in different categories. Thus, in 2012 Index of Economic Freedom, for Azerbaijan, calculators of this index have found fiscal, and labor freedom as *free*, monetary, and trade freedom as *mostly free*, government spending, and business freedom as *moderately free*, investment freedom as *mostly unfree*, property rights, freedom from corruption, and financial freedom as *repressed*. Nevertheless, generally, political issues are considered to be much more influential on the values of this index rather than reality. Thus, indicating Armenia's economy much more free than Azerbaijan economy seems to be suspicious.

4. Conclusion

In this research, we looked through the macroeconomic and economic transition performance of Azerbaijan economy within 1991-2012. We found that, first period in Azerbaijan's economic history after the independence was characterized by sharp increase hyperinflation and decline in total output. However, establishing the National Bank and National currency should be considered as the welcoming events of this period. The initial conditions of the transition were difficult to implement reforms for access to free market economy. Azerbaijan entered a new period of transition in 1995 with two crucial events: the cease-fire agreement and the "Contract of the Century" which took the country to a better place.

The evaluation of the restructuring period (1995-2005) of Azerbaijan economy may be confusing. Gaining stability in a political environment supported the inflow of FDI and growth in economy. If only macroeconomic performance of the country would be analyzed, the evolution "score" would be very good. Nevertheless, the detailed analysis indicates that this "score" is highly related to the oil production, especially in 2005. Therefore, the oil-based development of Azerbaijan may cause additional negative effects for other sectors of economy what called as "Dutch Disease". Despite of the oil-based development and the mistakes done in privatization, particularly in agriculture sector that still preserves its negative effects in terms of international competitiveness, the path from recession to this level of development under those conditions should be considered as a success. In addition, opening of BTC pipeline in May 2005 would take Azerbaijan to another period of economic development called as oil boom.

Azerbaijan's economic development in this period (2005-2012) was mostly related to the sharp increase in oil production. At first sight, the macroeconomic performance may be considered as very good. However, some problems still remain in its economy. The biggest economic issue for the near future is

developing non-oil & gas sectors in Azerbaijan economy. Decreasing oil & gas dependence and misbalance among sectors of economy as well as establishing a diversified economy with strong export oriented industry could take Azerbaijan to a better place.

In light of EBRD transition scores, and Index of Economic Freedom, the question rises whether or not the economic transition has ended, as officially declared in 2009. According to EBRD transition scores, none of the transition measures has changed toward being better after 2005, as even the competition policy score has decreased in 2011-2012. Referring to Economic Freedom index, the score has slightly changed during the whole period. Nonetheless, Azerbaijan has introduced itself after 2009 as an economy that surpassed the transition period. That is why, the international community considers Azerbaijan as an emerging economy. However, from an economic perspective, the “end” of the transition in Azerbaijan’s economy should be studied comprehensively.

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Rules and Discretion in Monetary Policy: Is the Response of the Stock Market Rational?

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We investigate the effects of the monetary policy conduct on the domestic capital market for a sample of developed countries where the capital market plays a significant role in the economy. We break down the policy rate innovations in rules-based and discretionary components in order to determine the degree of prudence in the monetary policy conduct and we study their accounts with respect to capital market rationality. The rules-based component is determined using an interpolated vanilla Taylor-rule policy rate at the event date and the discretionary component is obtained by subtracting the rules-based rate from the target monetary policy rate innovation. Using an event study approach, we analyze the impact of monetary policy components on the returns of the stock market and we determine that the conduct of the monetary policy can cause irrational responses of the capital market. More than that, we show, for the analyzed countries, that if the general level of discretion in the monetary policy is high the response of the stock market becomes increasingly erratic, indicating that forward guidance may help reduce uncertainty on capital markets.

Keywords: *monetary policy, event study, capital market efficiency, discretion, rules, forward guidance*

JEL Classification: *G14, G18, E52, E43, D61*

1. Introduction

The relation between monetary policy and the stock market has been long discussed in the literature, as it is traditionally considered that prices on the stock market are an important transmission channel of the monetary policy.

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Efficient markets hypothesis as it was presented by Fama (1970), is the cornerstone of the capital market developments, stating that prices observed on the financial markets include all available information and consequently they are interpreted as offering correct signals for the future consumption and investment decisions carried out by individuals and corporations. Moreover, the efficient allocation of the capital stock in the economy can be done only in the context of efficient markets, otherwise the markets are not an optimal mechanism for the allocation of scarce resources and, in this context, researchers argue correctly that markets must be regulated in a way that will increase efficiency. In this sense, the capital market efficiency is very important for the performance of the overall economy and the cost-benefit analysis of macroeconomic policies should take into account the impact on domestic capital market efficiency. The literature on efficient markets is vast, and although initial research mostly validates the theory, in time, a strong critique coming from a number of researchers indicates that today the concept of efficiency has become only a desirable state of the financial markets. Fama (1991) writes a review of the most important papers on the topic of efficient capital markets.

On the other hand, monetary policy has always been an intriguing subject in the academic research. With the introduction of the Taylor-rule, a method that policymakers should use in order to meet the monetary policy objectives, it has become increasingly evident that an active monetary policy that follows a predetermined rule ultimately improves the performance of the overall economy, while a discretionary policy can have negative effects like inflation persistence or increased output volatility.

Therefore, the objectives of the present research is to find if unexpected policy rate events in discretionary or rules-based eras cause different effects on the capital market prices, which can or cannot be considered consistent with the idea of rational domestic capital markets. Particularly, the paper presents evidence from developed countries, on the relation between the monetary policy conduct and its effects on the domestic capital market in a way consistent with the assumption of efficient capital markets.

The paper is structured as follows: Section 2 consists of the relevant literature review on the links between the monetary policy and the capital market along with evidence and importance of rational domestic capital market for the overall economic performance; Section 3 present data and methodology, Section 4 includes the results of the analysis and Section 5 presents the final conclusions.

2. Literature review

In finance, it is unanimously accepted that the main function of efficient financial markets is to continuously discount uncertain future net cash flows, therefore the effects of monetary policy events on real financial assets prices rest on the assumption that the discount rate in the market is linked to monetary policy changes. The other side of the coin is the classic idea that the monetary policy is neutral with respect to real prices in the economy and therefore should we should not expect to see any effects on the real prices of financial assets either. Thorbecke (1997) documents this issue, and shows that monetary policy has real effects on the capital market, therefore invalidating the neutrality idea and providing a strong incentive for this present research.

If we take a more pragmatic approach and judge from the perspective of an accountant, the income statement results must be sensitive to monetary policy as firms cost of debt and the operational leverage are both influenced by the interest rate prevailing in the debt market, therefore changing the expected dividend (or net cash-flow) sequence which has ultimately impact on the value of the firm. Also, the capital structure of the firm can change as the risk-free interest rate may offer an opportunity for higher financial leverage or can determine equity capital increases instead, and studies, such as Lang, Ofek and Stulz (1996) and others, show that, in the real world, the financial leverage affects the value of the firm, somewhat invalidating the Modigliani-Miller famous rational theorem, from Modigliani and Miller (1958). If we pursue this logic, we make a compelling case for the importance of monetary policy events relative to the real financial assets prices.

Another important question that we should advance before proceeding with the research is that, do regulators of monetary policy seek capital market inefficiency, or at least, should they even be concerned that their actions can have impact on the efficiency of capital markets. Our view is that they should be concerned, as inefficiency in the financial markets has obvious effects on the risk-return relationships of financial assets and this mismatch can lead to inappropriate allocation of scarce resources. Importantly, Fischer and Merton (1984) show that the capital market is the most important predictor of future business cycles and therefore maintaining its efficiency should be a top-priority for any macroeconomic policy.

The paper also has obvious implications on the risk management policy at firm level as well, if capital markets are inefficient even on short term, there are risks that are not included in the value of the firms and this fact creates an incentive to obtain capital, through debt or equity markets, too cheap (expensive) when the public companies are overpriced (underpriced).

2.1. A short review of efficient capital markets literature and the ambiguous relation between the monetary policy and the capital market.

The related literature identifies three forms of market efficiency, as first proposed by Fama (1970): weak, semi-strong and strong. The weak form implies that information related to past prices must be included in the current price, the semi-strong implies that all relevant publicly-available information (here we can include both systematic and idiosyncratic factors) must be included in current prices and a strong form efficient market is a market where even private information is included in prices. Importantly, Fama (1991) rethinks the tests for market efficiency in tests for return predictability (weak-form tests), event studies (generally semi-strong form tests) and tests for private information (strong form tests), argues for the need of an improved economic model of asset returns and presents the event studies as the most robust approach in testing market efficiency, mainly because it drastically reduces the joint hypothesis problem that plagues all efficiency tests.

Bernanke and Kuttner (2005) carry out a similar research to the one conducted here, they investigate how the unexpected changes in Fed Funds rate influence the aggregate prices of the stock market. Unlike our study, Bernanke and Kuttner (2005) uses deviations of the spot rate from Fed Funds futures rate, which is considered to incorporate all relevant information, in order to study the effects of unanticipated policy rate changes on the aggregate financial assets prices, finding that an unanticipated rate cut of 25 basis points leads to an 1 percent increase in the stock market prices. The researchers used the event study approach, also using regular intervals for policy measurement, and they also used a VAR approach in order to find fundamental reasons for the exhibited behavior. However, Bernanke and Kuttner (2005) do not explicitly analyze the implications to the efficient markets hypothesis level in the event-study. Rigobon and Sack (2004) reinforce the results and find that an increase in the Fed Funds interest rate of 25 basis points results in a decrease of the financial market index by about 1.9%. Rigobon and Sack (2004) methodology is somehow different from the event-study carried out by Bernanke and Kuttner (2005) as they address the endogeneity problem of the monetary policy and replace the OLS estimators with a measure of heteroskedasticity of policy innovations measure. Bredin, Hyde, Nitzsche and O'Reilly (2007) carry out a similar event study to Bernanke and Kuttner (2005) applied on United Kingdom (using another futures contract that incorporates information about the expected monetary policy, i.e. the 3-month sterling futures contract), coming to similar conclusions, which indicates a timeless and universal connection between the monetary policy and the capital market.

Chulia, Martens and van Dijk (2010) use intra-day information in order to assess the impact of unexpected Fed Funds changes on the prices of financial assets and to measure an asymmetric effect of the capital market response. Using an event-study methodology, the researchers conclude that negative news for capital market prices (unexpected increases in the Fed Funds rate) induce decreases in financial asset prices regardless of the size of the unexpected event, whereas for positive news for the capital market (unexpected decreases in the Fed Funds rate) the size becomes important. The researchers conclude that the market is efficient because expected Fed Funds changes are properly anticipated and that unexpected changes affect the price of financial assets.

3. Research methodology

3.1. Selection of relevant countries and appropriate

In this section we explain the selection of the relevant countries for the analysis. The purpose of this selection method is to give more meaning to the research by selecting only the countries which rely on a significant way on domestic capital market financing of economic activities.

First, we include in the sample only developed countries, mainly because it is public knowledge by now that developed countries are relying more on capital market financing than developing countries. It would be really interesting to carry out a similar research on emerging countries. The monetary policy on emerging countries exhibits more discretionary actions causing more heterogeneous effects on the capital market. It would be interesting to see if the discretionary monetary actions have different effects on capital markets of developing countries than on the developed countries capital markets.

The next task is to propose an analysis in order to find out which economies rely the most on the stock market. The most appropriate indicator in our particular situation would be the ratio between the total financing of medium and large firms intermediated by the capital market and the total financing of medium and large firms in the economy; but unfortunately we could not find such data, so we chose to rank the countries by their capital market capitalization/GDP indicator.

We consider this approach as being satisfactory, mainly because as the market capitalization is higher, the prices of financial assets tend to become very important for the economy and consequently macroeconomic policy should monitor closely the movements of capital markets.

The initial sample consists of the G7 countries (i.e. Canada, France, Germany, Italy, Japan, United Kingdom and United States), as those countries the most developed in the world and we select the best 3 countries ranked by market cap/GDP ratio, considering 2012 as the reference year, the last entry in the World Bank Database. We chose to present a static analysis as we consider that a dynamic analysis of the historical ratios would unnecessarily complicate the results.

Table 1. G7 countries ranked by market cap/GDP ratio

Country	Market Capitalization/GDP(%)
United Kingdom	122.7
USA	114.9
Canada	110.7
France	69.8
Japan	62
Germany	43.4
Italy	23.9

Source: Author's calculations.

The data is collected from the World Bank Database

This ranking obviously does not imply that only for the first 3 countries the capital market prices are important for macroeconomic policies, we used the ranking just to somehow contain the expansion of the research and probably the conclusions of the paper would not be changed if we used a larger sample of countries.

3.2. Data selection and the Taylor rule

First, we proceed with the selection of relevant data for the measurement of the monetary policy. Then, using quarterly data, we compute the original Taylor rule (Taylor, 1993, pp.195-214) and separate all the monetary events in rules or discretion-based. The Taylor rule that we will use for all three countries in our investigation is:

$$r = \pi + i + .5(\pi - \pi^*) + .5(Y - Y^*) \quad (1)$$

where r is the policy rate, π is the actual inflation rate (output deflator or CPI), i is the real interest rate assumed to be a constant 2%, π^* is the target inflation rate, $(Y - Y^*)$ is the output gap, which measures deviations of actual real output from the potential, which is measured by Taylor (1993) as deviations from a linear deterministic trend. Further, another important methodological issue is that the Taylor rule is computed using quarterly data but the monetary events are not observed at regular quarterly intervals. Therefore we will intrapolate the appropriate Taylor rule at the event date from the previous quarterly Taylor-rule and the effective next period rules-based policy rate. This method is not inappropriate for our investigation, as policymakers do not use information only from past quarterly data in their decisions, their decisions are based on current information related to inflation, real output and of course other exogenous factors that might be a temporal or permanent threat for price and financial stability. For example, we have the first monetary event on 4th of February 1994 (a rate increase of 0.25%), therefore the intrapolation technique will provide an estimate for Taylor rule rate on that date based on the end of December Taylor-rule rate and the end of March Taylor rule. Because the 4th of February is 33 days away from the January Taylor-rule rate and 57 days away from the March Taylor-rule we will obtain the rate using the following formula:

$$\Delta i_r = \frac{57}{90} \Delta i_{January}^T + \frac{33}{90} \Delta i_{March}^T$$

where

Δi_r is the Taylor-rule consistent rate at the date of the monetary event, 4th of February 1994,
 $\Delta i_{January}^T$ is the rate for the first quarter of the year and
 Δi_{March}^T for the second quarter.

Although the assumption that central bank has unbiased estimates of future inflation and output gap is sufficient for including only the forward Taylor-rule policy rate in the analysis, we considered better to also include the prior Taylor-rule rate in order to minimize the effects of inefficient central bank estimates.

The point of this simple technique is to use updated information about the changes in inflation and output gap. Although the forward inflation and output are not known precisely by regulators at the time of the decision, we assume that they have reliable estimates (i.e. the estimates of future changes in inflation and output gap are efficient) and consequently their actions (which are the monetary policy events) do not reflect only last quarter effective inflation and real output variables, but also consistent estimates of future changes in policy rate variables. After the formula above will be applied analogous to all monetary policy events we will break down the actual monetary policy event in two separate components: a rules-based component and a discretionary component in the following way:

$$\Delta i_t = \Delta i_r + \Delta i_d \quad (2)$$

where

Δi_t is the target change in the Federal Funds rate from the previous period set by policymakers and
 Δi_d is the discretionary component of the target policy rate.

Afterwards, we will run the event-study methodology and identify the impact of the innovations on the domestic capital markets. The event-study consists on a battery of regressions where the explained variable is the domestic capital market index same-day log return against the explained variables which are, in turn, the raw actual policy rate, the rules-based rate (obtained from breaking down the actual rate in a rules-based and a discretionary component), the discretionary component and both the rules-based and discretionary components. In order to achieve our objective of investigating the effects of rules-based and discretionary policy rate events on the stock market our first task would be to assess some kind of “rational” response of the stock market related to the policy rate. Therefore, we consider as rational response the negative parameter of the individual regressions against the rules-based and discretionary components.

We also present an indicator which shows to what extent the monetary policy innovations follow a rules-based approach. We calculate the indicator as the sum of absolute discretionary innovations divided by the sum of absolute raw monetary policy changes and we divide the value to the number of policy events. The indicator will provide a quantitative measure to the overall degree of discretion in the monetary policy.

In general, the data for the event study will start from 1994, mainly because before 1994 the monetary events were released together with other macroeconomic news making impossible to isolate the monetary policy event from the other relevant events and because the Taylor-rule started to gain attention from policymakers. Particularly, the dataset can be adjusted depending on the availability of data or because the policy rate for a country can change with a high frequency (as it is the case of Canada monetary policy starting from 1994 to 1996) making the event-study methodology inappropriate.

4. Analysis and Results

This section presents the research results and is divided in 3 parts, each corresponding to a selected country.

4.1. USA

For US monetary policy rate measurement we selected the target Fed Funds rate announced by the FOMC (US Federal Open Market Committee), the rate at which financial depository institutions lend excess balances at the Federal Reserve to other financial depository institutions. The rate is also suggested by Bernanke and Blinder (1992) as the best rate for measuring monetary policy effects. The data is collected from the beginning of 1994 until the end of 2013, mainly because only from 1994 FOMC began announcing changes in the policy rate, before that period, monetary news were released along with other relevant macroeconomic data, making vastly impossible to isolate the effects of the monetary events. In the analyzed period, we have 59 monetary events with the mentions that (1) on 16 December 2008, FOMC decided to make a corridor for the Fed Funds rate from 0% to 0.25% and we considered the upper interval as the policy rate event for that date and (2) we will exclude from the analysis the observation from 17th September 2001, as it is the first trading day after the 11th September 2001 terrorist attacks and consequently the monetary event could not be isolated. The rate announcements generally become public when the stock market is opened, so our investigation will focus on same day changes. The only exception is on 15th October 1998 when the policy rate announcement became public after the market closed, therefore we will use the opening return of the capital market index on 16th October 1998 for the event study. The data for computing the Taylor-rule is collected from the FRED (Federal Reserve Bank of St. Louis) database, namely the GDP implicit price deflator, as a proxy for the inflation rate, and the actual and potential real GDP growth rates with quarterly frequency. Please note that the original Taylor formula does not include growth rates of actual and potential real output, but level values. We use the S&P500 index return as a proxy for the performance of the USA capital market, data collected from the Thompson-Reuters EIKON database.

First, we calculated the discretionary indicator to be 0.2, which shows that the policymakers generally respect the Taylor policy rule and consequently, we can say that United States follows a prudential monetary policy. This indicator is important for our general conclusions and will be reported for each country included in the analysis.

Table 2 contains the regression results of the S&P500 index same-day log return against the raw actual target Fed Funds rate changes,

$$R_m = \alpha_1 + \beta \Delta i_t + e_t \quad (3)$$

where R_m is the domestic capital market return.

Table 2. *The response of S&P500 index to raw target changes of the Fed Funds rate*

Statistic	Value
Intercept	0.40 (2.35)
Explanatory variable Coefficient	-0.82 (2.12)
Multiple R	0.19
Adjusted R squared	0.02
DW test	2.05

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 59 policy rate events from 1994 to 2013.

Notice from Table 2 that the response of the S&P 500 index to the raw target policy rate changes is weak as the coefficient of determination is insignificant. The parameter of the regression line is negative, as expected, and the t-statistic shows that the coefficient is statistically significant different than 0 with 95% level of confidence. The Durbin-Watson test shows no important level of heteroskedasticity of the errors term.

Now, we proceed with a multiple regression which includes the rules-based and discretionary components of the policy target rate as the explanatory variables and the S&P 500 same-day returns as explained variable, as follows:

$$R_m = \alpha_2 + \beta_1 \Delta i_r + \beta_2 \Delta i_d + \varepsilon_t \quad (4)$$

Table 3. Response of the S&P 500 index returns to the rules and discretionary-based components of the Fed Funds policy rate

	Taylor-rule component	Discretionary component
Intercept	0.32 (1.63)	
Explanatory variable coefficient	-1.07 (2.39)	-0.2 (0.37)
Multiple R	0.24	
Adjusted R squared	0.03	
DW test	2.07	

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 59 policy rate events from 1994 to 2013.

Notice from Table 3 that no significant improvement in the regression results are obtained after the Fed Funds target policy rate change was broken down in two components. Considering all the assumptions of our approach, a straightforward interpretation of this result is that the anticipations formed on the USA domestic capital market are not related to the conduct of monetary policy. At this point, it is important to add the fact that our results rest on the important fact that the methodology used in this paper presents rules-based monetary policy rates as a mechanical formula which must be followed by the policymakers and the degree of discretion in monetary policy is the observed deviation from that formula. As Taylor (1993) and many others researchers argue, using predetermined rules in monetary policy conduct does not imply that policymakers should not use their own judgment and provide some sort of qualitative input to the monetary policy and although our study definitely ignores this fact (and as a subjective opinion this would probably change the results in a significant manner), we think that this is the price one must pay when empirically testing the monetary policy conduct using an event study approach.

Further, we proceed with two separate regressions using explanatory variables rules and discretionary components in turn. The results are presented in Table 4:

Table 4. The response of the S&P 500 index returns to each component of the policy rate individually

	Taylor-rule component	Discretionary component
Intercept	0.32 (1.67)	0.4 (2.28)
Explanatory variable Coefficient	-1.01 (2.10)	0.41 (0.65)
Multiple R	0.24	0.07
Adjusted R squared	0.04	0
DW test	2.08	2.08

Source: Authors calculations. Data available from authors.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 59 policy rate events from 1994 to 2013.

The results for the individual regressions provide an ambiguous output for our domestic capital market efficiency test purposes. On one hand, the negative coefficient of the Taylor-rule component is statistically significant different than 0 at 95% level of significance performing relatively well compared to the discretionary component coefficient which is positive and statistically insignificant. Basically, we see a rational significant response of the stock market to the rules-based component of the policy rate and a much weaker and possibly

irrational (given that the coefficient is positive) response of the stock market to the discretionary component. This observation is somehow consistent with the idea that discretion in monetary policy induces market inefficiency, mainly because the information related to the degree of discretion in monetary policy is not included in the price of securities, assuming that discretionary changes should affect the stock market prices in the same manner as rules-based changes (i.e. homogenous impact of monetary policy changes).

Another explanation for this interesting observation, which would be consistent with the efficient market hypothesis but would not be consistent with our assumption that a policy rate innovation should have the same scaled microeconomic impact, is that discretionary monetary events are generally associated with inflation persistence or output volatility (therefore the impact on capital markets cannot be the same for rules and discretion-based innovations) and the capital market participants do not naively interpret that a discretionary expansion (contraction) will lead to increases (decreases) in capital market prices but they weigh in the macroeconomic risks of such a change. Such a view is not supported by the result of the regression against the discretionary component, as we would expect to see a higher coefficient of determination but instead we see that the discretionary decision has absolutely no impact on the capital market.

On the other hand, the results confirm that the anticipations on the US capital market are not related in a significant way to the conduct of the monetary policy, or at least to the mechanical separation of rules and discretion innovations presented here. The coefficient of determination of the first regression is 0.04 meaning that 4% of the variation of the stock market same-day return can be explained by a rules-based policy rate, similar to the result obtained by Bernanke and Kuttner (2003) after excluding outliers, where they use a measure of unexpected policy rate.

The results presented in this section for USA present a rather ambiguous relation between the conduct of monetary policy and the domestic capital market. First, our approach does not suggest a high connection between the conduct of the monetary policy and the performance of the capital market, as the coefficient of determination of the regressions presented in this section is low and indicates that only a small fraction of the variation of the domestic capital market index is explained by the rules component. This observation can be explained by our strict methodology for separating the rules-based and discretionary components.

Secondly, the individual regressions show us a rational response of the domestic stock market to the rules-based component and a response to the discretionary component which can be accounted only as irrational, as the rational response to increased systematic risk is invalidated by the regression results. Strictly speaking from the capital market performance perspective, our research should provide incentive for the policymakers to adopt rules-based decisions.

4.2. CANADA

We considered the Canada policy rate target rate the rate for overnight rate at which financial institutions borrow/lend from/to each other in order to cover their exposures during the day, through the Large Value Transfer System (LVTS). Generally, the Central Bank of Canada (BOC) operates the overnight market in a band of 50 basis points wide, making the overnight target rate the center of the operating band. BOC will always lend money to financial institutions at the top rate of the assumed operating band and borrow at the lower rate of the band, therefore the financial institutions will not trade balances at rates outside the operating band. It is important to mention that from March 1980 to February 1996 the policy rate was set at 25 basis points above the average yield on a 3-month treasury bill at the federal government's weekly auction (for more details about the history of the policy rate in Canada, please visit the official Bank of Canada site), which imply frequent changes to the policy rate. We consider that period inappropriate for the event-study methodology as the high frequency of policy events make vastly impossible the isolation of the event from other relevant news for the stock market. Therefore, we choose to consider for our analysis only monetary events from 22 February 1996, meaning 72 policy rate events. From the 72 events, we chose to proceed with the elimination of the outliers using the simple technique of interquartile range. The option to use an econometric method is because the narrative evidence about every event that we consider suspicious is scarce. As a proxy for the Canada capital market performance we use the S&P/TSX composite index log return. The data for the capital market index return and the policy rate events was collected from the Thompson-Reuters EIKON database. In order to compute the quarterly Taylor-rule we use the output gap series available on the Bank of Canada website, as we consider that measure to be better as the original deviation from a linear trend, proposed by Taylor (1993). As a proxy for inflation we use GDP deflator quarterly data collected from the FRED database.

First, the discretionary indicator for Canada has the value of 1, much larger than USA, which indicates that Canada monetary policy relies more on discretion or that they follow other policy rule.

We present the results of the interquartile range incipient analysis. Below you can find the interquartile table:

Table 5. *Interquartile table of the S&P/TSX index return*

	Values	Outliers Range	
Minimum value	-6.23%	Minimum	Maximum
1 st Quartile	-0.52%	-1.74%	1.53%
Median	-0.03%		
3 rd Quartile	0.30%		
Maximum Value	4.11%		
Interquartile Range (IQR)	0.82%		

Source: Author's calculations.

The lower bound of the outliers range is $Q1 - 1.5 * IQR$ and the upper bound is $Q3 + 1.5 * IQR$. Using the method described above we eliminated 10 policy rate events: 27 August 1998, 29 September 1998, 22 March 2000, 23 January 2001, 18 October 2005, 22 January 2008, 8 October 2008, 21 October 2008, 9 December 2008, 20 January 2009.

We follow the structure of the USA section and present the regression results for the capital market index same-day return, as explained variable, against the raw change in the policy rate, as explanatory variable:

Table 6. *The response of S&P/TSX index to raw target changes of the Canadian policy rate*

Intercept	-0.07 (0.9)
Explanatory variable Coefficient	-0.30 (1.3)
Multiple R	0.18
Adjusted R squared	0
DW test	2.40

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 62 policy rate events from 1996 to 2013.

Observe that the regression results indicate that there is no significant relation between the domestic capital market index and the policy rate change as the coefficient of determination is low and although the parameter of the explanatory variable is negative as expected, it is not statistically significant different than 0, as shown by the t-statistic. The general response of the domestic capital market index in the case of Canada is even weaker than in the case of USA.

Next, we proceed with the multiple regression, where we add as explanatory variables the rules and discretion components:

Table 7. *Response of the S&P/TSX index returns to the rules and discretionary-based components of the Canada policy rate*

	Taylor-rule component	Discretionary component
Intercept	-0.07 (0.83)	
Explanatory variable Coefficient	-0.32 (1.34)	-0.32 (1.29)
Multiple R	0.24	
Adjusted R squared	0.01	

DW test 2.39

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 72 policy rate events from 1996 to 2013.

In the case of the multiple regression model, we do not see any improvement from the previous model where the raw change of policy rate was included as explanatory variable, which indicates that the Canadian stock market performance is not at all related to the conduct of the monetary policy. The parameters of the multiple regression, although negative, they are not statistically significant.

Further, we proceed with regressions of the capital market index return against each component of the policy rate:

Table 8. *The response of the S&P/TSX index returns to each component of the policy rate*

	Taylor-rule component	Discretionary component
Intercept	-0.06 (0.7)	-0.05 (0.67)
Explanatory variable Coefficient	-0.01 (0.18)	0 (0.03)
Multiple R	-0.02	0
Adjusted R squared	0	0
DW test	2.40	2.40

Source: Authors calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 72 policy rate events from 1996 to 2013.

The result of the individuals regressions only reinforce our observation that in Canada, the stock market performance is not related to the conduct of the monetary policy.

Further, in the examination of the monetary policy conduct influence on the stock market we also include the monetary policy components of US, in order to determine if the stock market responds to changes in target US policy rate, as the two economies are highly integrated. Secondly, Canadian stock market should respond in a significant manner to external shocks, as the economy is smaller and consequently its interest rate should adjust to the world interest rate, as indicated by the Mundell-Fleming model. In this case, we can say that the openness of the Canadian market is a determinant of the response of the stock market to the domestic monetary policy, as argued by Li, Iscan and Xu (2010). In order to see if our assumption is true we run a regression of the S&P/TSX index against the USA policy rates:

Table 9. *Response of the S&P/TSX index returns to the rules and discretionary-based components of the Fed Funds policy rate*

	Taylor-rule component	Discretionary component
Intercept	-0.5 (2.77)	
Explanatory variable Coefficient	-1.06 (2.1)	-1.28 (2.71)
Multiple R	0.28	
Adjusted R squared	0.05	
DW test	2.14	

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 60 policy rate events from 1992 to 2013.

Notice that the response of the Canadian stock market to the USA monetary policy components can be considered as rational and statistically significant for both rules-based and discretionary components. We can

consider this result as a confirmation of the well-known Mundell-Fleming logic for a small open economy with full capital mobility (i.e. Canada).

The conclusion is that, in the relevant sample, our event-study approach was unable to find any evidence of an even weak relation between the conduct of monetary policy and the Canadian stock market performance. We consider that this may be caused by the fact that USA and Canada economies are integrated and therefore the monetary policy of Canada becomes irrelevant for domestic prices as the interest rate adjusts to the world (USA) interest rate, as indicated by the Mundell-Fleming model.

4.3. United Kingdom

In United Kingdom the monetary policy decisions are taken by a Monetary Policy Committee, which is reunited on a monthly basis in order to change or maintain the official bank rate. The bank rate affects the real economy through the traditional channels therefore, can be considered equivalent to the Fed Funds rate and the Bank of Canada rate. The initial sample consists of 55 policy rate events through the period 1994-2013, the data is collected from the Thompson-Reuters EIKON database. For the quarterly Taylor-rule we use the standard GDP deflator data collected from the FRED database and the output gap data is collected from the Bloomberg database. As a proxy of the domestic capital market performance we will use the return of the FTSE100 index collected from the Thompson-Reuters EIKON database. We used the outlier removal technique and removed 3 events: 8 October 2008, 6 November 2008 and 5 March 2009. For more details regarding the data please consult the authors. The discretionary indicator for United Kingdom monetary policy is 0.61, indicating that the monetary policy degree of prudentiality is between USA and Canada.

We follow the regression equation sequence and proceed with the regression result of the same-day log return of the FTSE100 index against the raw changes in the policy rate:

Table 10. *The response of the FTSE100 same-day return to the raw target changes in the UK policy rate*

Intercept	-0.13 (0.97)
Explanatory variable Coefficient	0.90 (1.77)
Multiple R	0.28
Adjusted R squared	0.06
DW test	1.88

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 52 policy rate events from 1994 to 2013.

The results of the regression show that the market response to the changes in the policy rate is not statistically significant, as the t-statistic is low. The positive value of the coefficient is not necessarily relevant for our purposes, it only shows that raw changes of the policy rate are inappropriate when evaluating the impact on capital market efficiency. Therefore, we pursue with our regressions against the rules and discretionary components of the policy rate:

Table 11. *The response of the FTSE100 same-day return to both the rules and discretionary components of the policy rate*

		Taylor-rule component	Discretionary component
Intercept	-0.13 (0.97)		
Explanatory variable Coefficient		0.87 (2.12)	1.13 (1.90)
Multiple R	0.38		
Adjusted R squared	0.11		
DW test	1.88		

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 52 policy rate events from 1994 to 2013.

Notice that the result of the second regression is puzzling. First, the coefficient of determination is high, compared to the regression against raw changes, which suggest that the break-down of the policy rate in discretionary and rules-based explains a significant part of the same-day variation of the capital market. Secondly, the coefficients of the regression are positive which can indicate that the market response to the monetary policy conduct is irrational.

Now, we proceed with individual regressions against rules and discretionary components of the policy rate:

Table 12. *The response of the FTSE100 index to each component of the policy rate*

	Taylor-rule component	Discretionary component
Intercept	-0.18 (1.06)	-0.17 (1.07)
Explanatory variable	-0.17 (0.95)	0.27 (1.15)
Coefficient	-0.18	0.27
Multiple R	0.01	0.06
Adjusted R squared	1.76	1.77
DW test		

Source: Author's calculations.

Note: The numbers in the parentheses are the t-statistics of the model parameters, computed using Newey-West heteroskedastic and autocorrelation robust estimates. The full sample consists of 52 policy rate events from 1994 to 2013.

The individual regressions provide interesting and puzzling information. The regression against the rules component shows a negative but statistically insignificant coefficient and a low explanatory power of the model, indicating that 1% of the same day stock market variation is explained by a rules-based monetary policy innovation. On the other hand, the regressions against the discretionary we see a positive and statistically insignificant coefficient but a relative better explanatory power of the model may indicate that the capital market prices increased macroeconomic risks associated with monetary decisions.

5. Concluding remarks

The purpose of our paper was to see if there is any relation between the conduct of the monetary policy and the short-term efficiency of domestic capital markets. Our paper has implications on the cost-benefit analysis of any monetary policy change, the policymakers must with respect to the importance of ignoring short-term capital market effects. It is our opinion that the monetary policy objectives should not include explicit reference to the capital market performance because inserting a factor in the policy rule related to the performance of the capital market and committing to respect the rule can (and probably will) lead to large deviations from fundamental values as the average response of the capital market to the policy components is weak and indicates that there are many other factors that influence the variation of stock market prices. Although, the traditional objectives of the monetary policy do not include any explicit reference to the capital market prices, it can obviously have undesirable effects on the expected return-risk relationship on the domestic capital market, which can be further transmitted to the real economy if the capital market is an important mechanism for resource allocation in the overall economy. In this sense, we think that the capital market efficiency should be considered as a secondary objective in the monetary policy design. In order to close the circle, it would be of high interest to see to what extent the short-term inefficiency of the stock market propagates to the real economy and any researcher should be encouraged by our findings to pursue this objective in another paper.

Also, our results interestingly show that there is no universal relation between the conduct of monetary policy and the performance of the capital market. In USA for example, we have a strong response of the capital market to the rules monetary policy component but we do not see the same behavior for other countries. This interesting fact can only be explained by the discretionary indicator, showing that if monetary policy decisions rely more on discretion, the stock market response becomes increasingly erratic and can cause irrational responses. If we judge strictly from the perspective of capital markets effects, the observation can also indicate that forward guidance, meaning a commitment to follow a predetermined rule, helps monetary policy to reduce microeconomic

uncertainty. Therefore, the result definitely provides motivation for policymakers to use forward guidance in the policy conduct in order to increase the efficiency of capital markets and reduce volatility caused by noise trading. In general, if discretionary policy rate events are considered the response of the monetary authority to issues of financial stability, then we can think that the results of the paper provide evidence of the trade-off between macroeconomic stability and short-term capital market efficiency, with the mention that the policy rate decision must also be conditional on identifying if the short-term capital market inefficiency is indeed transmitted to the real economy.

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Propensity to Search: Common, Leisure, and Labor Models of Consumer Behavior

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The analysis of the propensity to search specifies the “common” or the ordinary model of consumer behavior based on the synthesis of the neoclassical approach with satisficing concept, and “leisure” and “labor” models of behavior that represent different combinations of conspicuous consumption, leisure, and labor. While the “common model” of behavior demonstrates a moderate propensity to search, “leisure” and “labor” models of consumer behavior exhibit vigorous propensities to search that results in purchase of unnecessary items and therefore in overconsumption. This trend is also presented in home production where vigorous propensity to search takes the form of the vigorous propensity to produce at home. The analysis of trends in allocation of time provides grounds for the assumption that men have more accentuated propensity to search and to produce at home than women that results in overconsumption of unnecessary items.

Keywords: propensity to search, propensity to produce at home, consumption-leisure choice, Veblen effect

JEL Classification: D11, D83

1. Introduction

The previous papers on the optimal consumption-leisure choice under price dispersion have demonstrated the importance of the concept of propensity to search, i.e., to substitute labor for search (Malakhov 2012, 2013, 2014a, 2014b, 2014c). The basic assumption of this concept is that labor and search always “move” in opposite direction, or the value $\partial L / \partial S$ is always negative because labor and search represent different sources of income. The analytical significance of this concept needs a particular effort that could summarize results of comparative analysis of different models of consumer behavior produced by different propensities to search. And that effort is realized in the paper presented here. It is organized as follows. Part 2 describes the moderate propensity to search in the “common model” of behavior, i.e., in the model that explains the every day economic behavior on the basis of the synthesis of the methodology of optimization with the satisficing approach. Part 3 illustrates the vigorous propensity to search in the “labor model” and in the “leisure model” of behavior. The comparative static analysis of the vigorous propensity to search in Part 4 describes the behavior of *laborholics* during sales and the mechanism of the Veblen effect. Part 5 analyses home

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production under the assumption that propensity to produce at home represents a specific form of the propensity to search with regard to the statistical data on the allocation of time in the USA during last decades. The analysis of the propensity to produce at home results in the assumption that disequilibrium conspicuous consumption represents an important factor of consumer demand.

2. Propensity to Search in “Common Model” of Behavior

The static optimal consumption-leisure choice can be described by the Cobb-Douglas utility function $U(Q,H)=Q^{-\partial L/\partial S}H^{-\partial H/\partial S}$ subject to the equality of marginal savings on search to its marginal costs:

$$\max U(Q,H) \text{ subject to } w \frac{\partial L}{\partial S} = Q \frac{\partial P}{\partial S} \quad (1.1)$$

$$\Lambda = U(Q,H) + \lambda \left(w - \frac{\partial P}{\partial S} \frac{Q}{\partial L / \partial S} \right) \quad (1.2)$$

$$\frac{\partial U}{\partial Q} = \lambda \frac{\partial P / \partial S}{\partial L / \partial S} \quad (1.3)$$

$$\frac{\partial U}{\partial H} = -\lambda Q \frac{\partial P / \partial S}{(\partial L / \partial S)^2} \frac{\partial^2 L}{\partial S \partial H} = -\lambda \frac{w}{\partial L / \partial S} \frac{\partial^2 L}{\partial S \partial H} \quad (1.4)$$

where the value of price reduction or marginal savings on purchase $\partial P / \partial S$ is given by a location and price settings of a store, the value $(-\partial L / \partial S)$ is equal to the share of non-leisure time in the time horizon of the consumption leisure choice $(-\partial L / \partial S = (L+S)/T)$, the value $(-\partial H / \partial S)$ is equal to the share of leisure time $(-\partial H / \partial S = H/T)$, and the value of the time horizon T is equal to the time until the next purchase or to the commodity lifecycle (Figure 1):

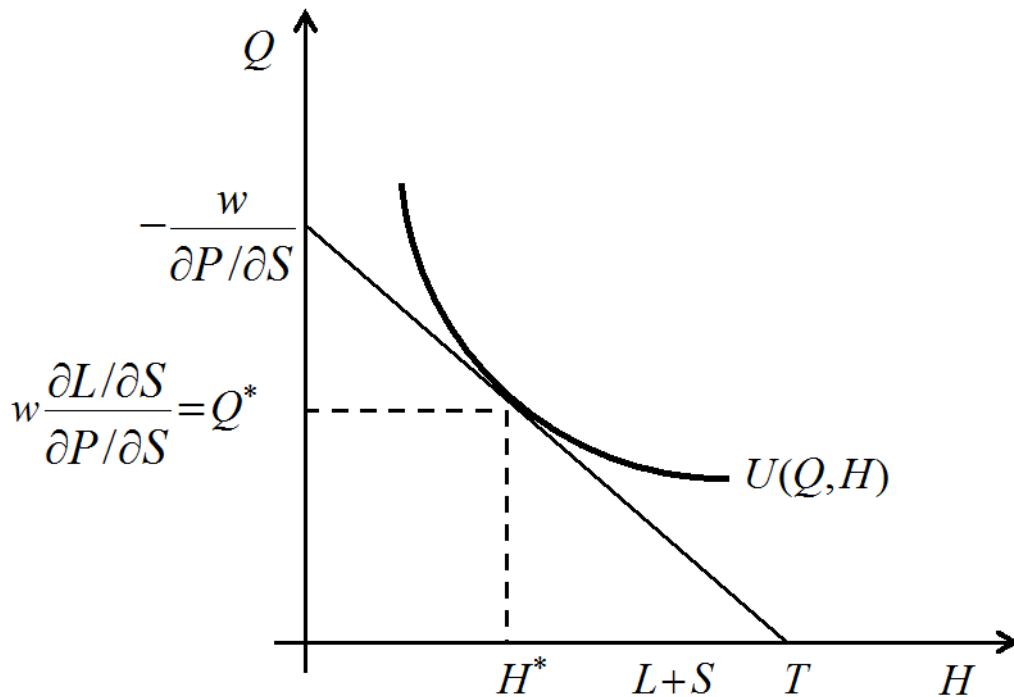


Figure 1. “Common model” of behavior

The optimization problem results in the “common model” of behavior. The key attribute of the “common model” of behavior is the moderate propensity to search $\partial L / \partial S$. Here it is limited, as we can see at Figure 1, by the $[-1;0]$ interval. While the value of the propensity to search can be literally described by the “whiskey-soda-ice” metaphor, when ice (search) displaces both whiskey (labor) and leisure (soda) in the glass (Malakhov 2013), it can be directly derived from the optimization problem:

$$\frac{Q^*}{Q_{\partial L/\partial S=-1}} = \frac{w \partial L / \partial S / \partial P / \partial S}{-w / \partial P / \partial S} = \frac{L+S}{T} \Rightarrow \frac{\partial L}{\partial S} = -\frac{L+S}{T} \quad (2)$$

The static resolution of the utility maximization problem gives the way to the comparative static analysis of the satisficing decision where one part of the constraint, the value $\partial P / \partial S$, is softened; the consumer reserves the labor income and takes a chance to search the pre-determined quantity in different places of purchases where he finally finds the satisficing price P_P that equalizes marginal costs of search with its marginal benefit and therefore maximizes the utility of the consumption leisure choice with respect to the given wage rate w and to the chosen place of purchase $\partial P / \partial S$ (Malakhov 2014a). If we re-arrange the presentation of the propensity to search we can easily show that its derivative with respect to leisure time is equal to the inversed value of the time horizon T :

$$\frac{\partial L}{\partial S} = -\frac{L+S}{T} = \frac{H-T}{T} \quad (3.1)$$

$$\partial^2 L / \partial S \partial H = 1 / T \quad (3.2)$$

The utility maximization problem and the satisficing decision procedure becomes interconnected by the equilibrium price P_e where $P_e = w(L+S) > P_P = wL$, that enters into the marginal rate of substitution, of leisure for consumption in the following form:

$$-\frac{dQ}{dH} = \frac{\partial U / \partial H}{\partial U / \partial Q} = -\frac{w}{\partial P / \partial S} \partial^2 L / \partial S \partial H = -\frac{w}{T \partial P / \partial S} = \frac{w}{w(L+S)} = \frac{w}{P_e} \quad (4)$$

3. Propensity to Search in “Labor” and in “Leisure Model” of Behavior

As we can see, the “common model” of behavior takes place when search plays a supporting role with regard to labor. Here the search only adjusts labor costs to the *satisficing* level. It happens because when $\partial L / \partial S > -1$, the constraint in Equation (1.1) produces the “common” relationship between the wage rate and marginal savings on purchase $w > Q / \partial P / \partial S$. But if the consumer can get from the search marginal savings greater than the wage rate, that *aspiration* changes his model of behavior. The relationship $w < Q / \partial P / \partial S$ results in vigorous propensity to search $\partial L / \partial S < -1$. Now the labor starts to play a supporting role to the search. However, the vigorous propensity to search changes the relationship between search and leisure. This relationship becomes positive, or $\partial H / \partial S > 0$, due to very simple reasoning:

$$L + S + H = T \Rightarrow \partial L / \partial S + 1 + \partial H / \partial S = 0 \quad (5)$$

However, the positive $\partial H / \partial S$ relationship changes the sign of the second derivative $\partial^2 L / \partial S \partial H$. It becomes negative – the increase in leisure time decreases the value of propensity to search $\partial L / \partial S$ and increases its absolute value $|\partial L / \partial S|$. It happens because here either the increase in labor supply reduces, both search and leisure or the fall in labor supply contributes to both search and leisure.

The negative second derivative $\partial^2 L / \partial S \partial H$ does not affect the marginal utility of consumption in Equation (1.3) but it changes the value of the marginal utility of leisure in Equation (1.4). The latter becomes negative.

Unfortunately, it is difficult to find the natural algorithm for this kind of the redistribution of time like the “whiskey-soda-ice” metaphor makes it for the “common model” of behavior. We can try to derive the geometrical algorithm for $\partial L / \partial S < -1$; $\partial H / \partial S > 0$ relationships.

Equation (1.4) tells us that the vigorous propensity to search $\partial L / \partial S < -1$ produces the “negative” leisure (Figure 2):

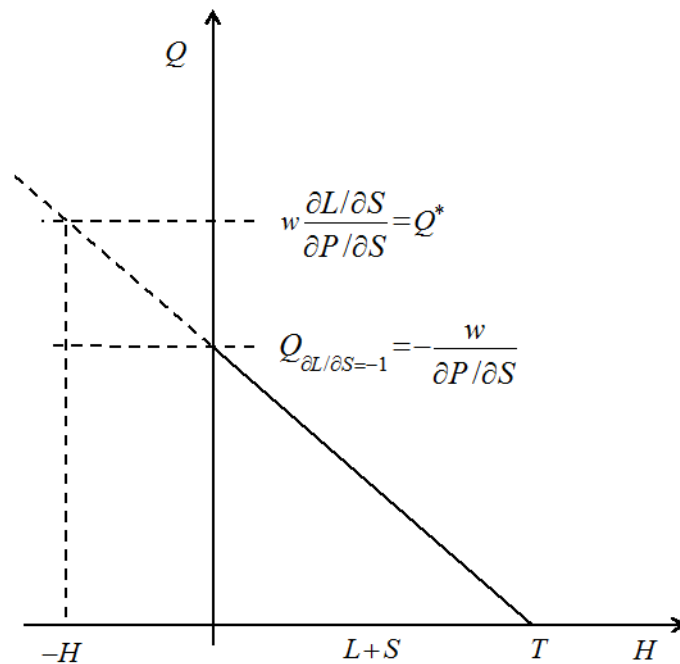


Figure 2. “Negative” leisure

However, the negative second derivative $\partial^2 L/\partial S \partial H$ changes not only the marginal utility of leisure itself. It also changes the consumption-leisure relationship. The negative second derivative $\partial^2 L/\partial S \partial H$ changes the sign of the marginal rate of substitution of leisure for consumption in Equation (4) and the value $\partial Q/\partial H$ becomes positive.

While this is rather easy to state the fact that both the vigorous propensity to search $\partial L/\partial S < -1$ and the negative second derivative $\partial^2 L/\partial S \partial H$ result in “bad” leisure, it is more difficult to present the graphical solution for normal consumption and “bad” leisure keeping in mind all geometrical proportions produced by Figure 2. Here we can pay attention to the fact that the positive $\partial H/\partial S$ relationship also changes the shape of the utility function $U(Q, H) = Q^{\partial L/\partial S} H^{\partial H/\partial S}$. The change in the shape of the utility function needs a change of the leisure axis. As a result, the graphical resolution of the “normal consumption – “bad” leisure” relationship takes the following form (Figure 3):

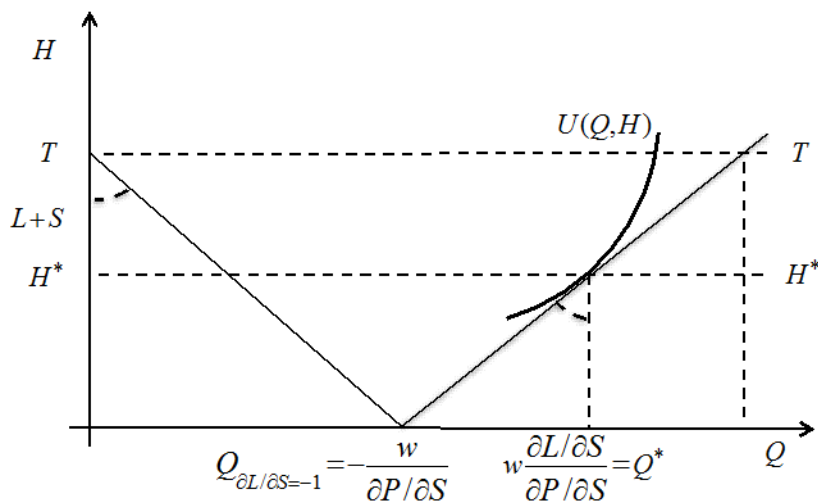


Figure 3. Normal consumption and “bad” leisure

If we re-arrange the constraint of the model from Equation (1.1) with respect to Figure 3, keeping in mind that Equation (5) always tells us that $\partial L / \partial S = -(1 + \partial H / \partial S)$, we get the following result:

$$Q^* = \frac{w}{\partial P / \partial S} \partial L / \partial S = -\frac{w}{\partial P / \partial S} (1 + \partial H / \partial S) = -\frac{w}{\partial P / \partial S} \left(1 + \frac{H}{T}\right) \quad (6)$$

It looks like the consumer cannot get the target level of consumption if he spends all time only for labor and search ($Q_{\partial L / \partial S = -1} < Q^*$). Here we pay attention to the fact that the time horizon is given or $T \neq T(Q)$. Of course, when consumer buys a quality item with longer lifecycle the value of the time horizon should be changed. But in this case the equilibrium marginal savings are also changed or the consumer followed by the satisficing decision procedure chooses another place of purchase. The analysis of change in place of purchase or the choice under $T = T(Q)$ assumption stays beyond the scope of this paper. Partially that problem was discussed in the analysis of shorter shelf-life under price discount (Malakhov 2014a) and in the examination of the phenomenon of sunk costs sensitivity (Malakhov 2014 b).

However, when search is more efficient than labor and marginal savings on purchase are greater than the wage rate, the consumer can cut labor time in favor of both search and leisure. And the increase in leisure time provides him with a missing quantity of consumption $dQ(H)$:

$$Q^* = Q_{\partial L / \partial S = -1} + dQ(H) = -\frac{w}{\partial P / \partial S} \left(1 + \frac{H}{T}\right) = -\frac{w}{\partial P / \partial S} - \frac{w}{\partial P / \partial S} \frac{H}{T} = Q_{\partial L / \partial S = -1} + dH \frac{\partial Q}{\partial H} \quad (7)$$

The mathematical calculation of the optimal consumption Q^* can provide another graphical resolution. We can expose it in the following form (Figure 4):

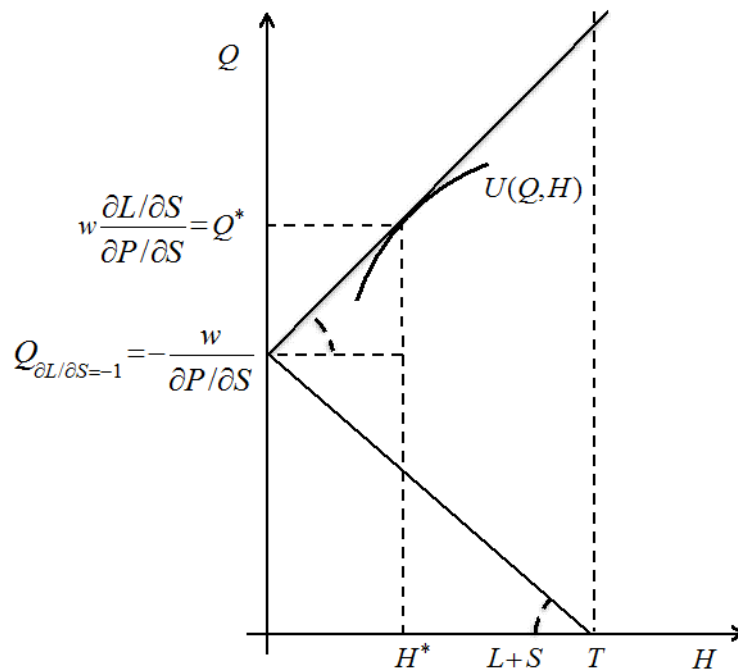


Figure 4. “Bad” consumption and normal leisure

While the utility function is still described as $U(Q, H) = Q^{-\partial L / \partial S} H^{-\partial H / \partial S}$, the comeback of consumption to the vertical axis changes again its shape. Now the utility function represents the consumer choice of “bad” consumption and normal leisure.

We can denote the choice of normal consumption – “bad” leisure as the “labor model” of behavior because here the vigorous propensity to search reduces both search and leisure time in favor of labor. And the combination of “bad” consumption with normal leisure can be denoted as the “leisure model” of behavior.

The key difference between two models is the value of the marginal utility of money income, which is described here by the value of the Lagrangian multiplier $MU_w = \lambda$ (Malakhov 2013). Its negative value changes signs of marginal utilities of both consumption and leisure. The negative marginal utility of money income $MU_w = \lambda$ makes marginal utility of consumption negative and, accompanied by the negative $\partial^2 L / \partial S \partial H$ value, it makes marginal utility of leisure positive.

However, both models have one important feature in common. Literally, both models could present **the behavior of the low-wage rate individual in the high-price store**. And according to Equation (6) for both “labor” and “leisure” models the propensity to search is described by the following relationship:

$$\frac{\partial L}{\partial S} = -\frac{H+T}{T} \quad (8)$$

The value of the vigorous propensity to search tells us that at the given wage rate the time horizon is not sufficient to get and to use the target level of consumption. To understand this phenomenon let’s imagine two individuals – high-wage rate and low-wage rate – who makes the same purchase at the same price ($Q^* = I; P_w = P_w$) in one high-price store ($\partial P_w / \partial S_w = \partial P_w / \partial S_w$). There the high-wage rate individual makes the satisficing purchase that corresponds to the equilibrium price (Malakhov 2014a):

$$W \frac{\partial L}{\partial S} = W \frac{H-T}{T} - W \frac{L+S}{T} = \frac{\partial P}{\partial S} \Rightarrow W(L+S) = -T \partial P / \partial S = P_e \quad (9)$$

The equilibrium price P_e is equal to the sum of labor and transaction costs of the high-wage rate individual. But it is not true for the low-wage rate individual:

$$w \frac{\partial L}{\partial S} = -w \frac{H+T}{T} = \frac{\partial P}{\partial S} \Rightarrow w(H+T) = w(L+S+H) = -T \partial P / \partial S = P_e \quad (10)$$

Here we simply develop the P.Diamond’s conclusion that we “have a single-price equilibrium with the price now equal to the willingness to pay of those [buyers] with high willingness to pay” (Diamond 1987, pp.434). If high willingness to pay corresponds to high wage rate then the equilibrium price should be determined by the behavior of high-wage rate consumers. The high-wage rate individual has higher willingness to pay because he starts searching in very-high-price store that is excluded from the search by the low-wage rate individual. Thus, the time of search of the high-wage rate individual is longer, or $dSW > dS_w$. Because at the level of the price of purchase both individuals have the same marginal costs, or $W \partial L / \partial S = w \partial L / \partial S$, the reservation level or the willingness to pay of the high-wage rate individual is higher, or $WLOW > wLOW$ due to the simple reasoning that $dWL(S) = dSW \partial L / \partial S$. This result should not look unexpected because it represents the form of so-called paradox of little pre-purchase search for big-ticket items (Malakhov 2014a). Here the purchased item represents a cheap item for the high-wage rate individual and an expensive item for the low-wage rate individual.

However, here the equilibrium price is equal not **to the willingness to pay** of high-wage rate individuals that equals to the reservation level but to their **willingness to accept** (Malakhov 2014a). This assumption clarifies not only the behavior of high-wage rate consumers who buy big-ticket items at their **satisficing level** in their convenient price niche but also the behavior of low-wage rate consumers who buy the big-ticket item at their **aspiration level** in the upper price niche. The willingness to accept of high-wage rate individuals recovers only costs incurred during work and search (Eq. 9). The willingness to accept of low-wage rate individuals recovers not only costs of purchase but also costs of forgone consumption, i.e., costs of leisure time (Eq. 10).

This assumption needs a reconsideration of the concept of the time horizon. The satisficing decision matches the time of product lifecycle with the time until next purchase. It means that in the “common model” of behavior the next purchase happens only after the utilization of a good. We see that it is not true for both “labor” and “leisure” models of consumer behavior. The time until next purchase, i.e., the time horizon of the consumption-leisure choice, is shorter than the product lifecycle. In the “common model” the consumer enters

the market with cash balances; he searches for an item; he buys it; he recovers his money balances spent for the purchase by labor time, and then he consumes the chosen item. However, it is not true for both “labor” and “leisure” models. There at the T value the consumer is ready to buy another item but he has not yet used the purchased item (Figure 5a). If he decides to consume it just after the purchase it means that leisure time squeezes labor time out from the time horizon. As a result, for the moment T of the next purchase money balances are not restored and the consumer can buy only an item cheaper than the first one (Figure 5b).

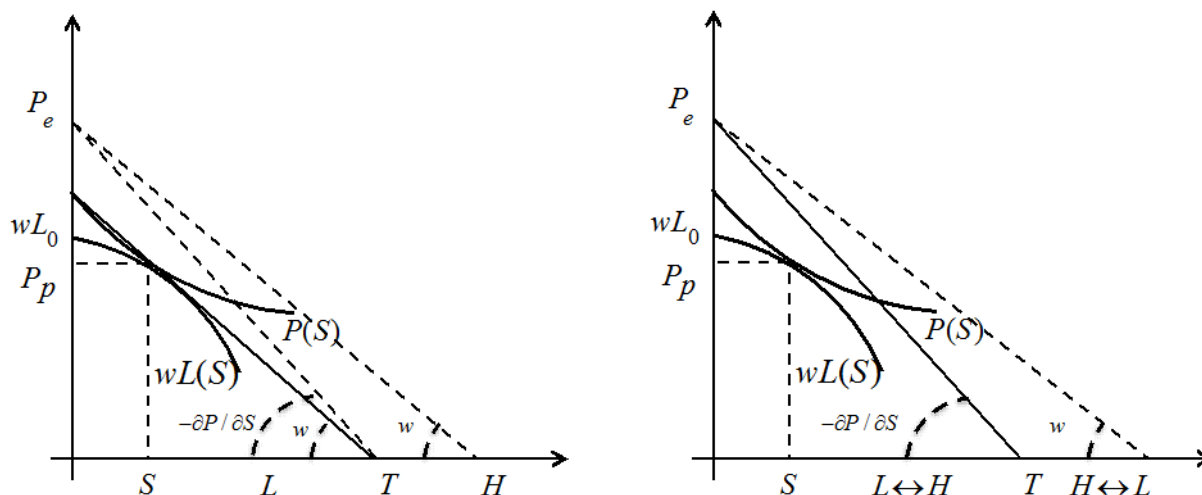


Figure 5(a,b). Postponed (a) and immediate (b) consumption of big-ticket item

We see that the vigorous propensity to search for the target level of consumption results not only in the purchase of an item in the upper price niche but also in the readiness to purchase another item before the first item will be utilized. Evidently, these two items are substitutes because both items meet some need. If the purchase of the second item happens when the consumption of the first item has not yet started, the consumer could spend the same amount on the second item that seems to be a perfect substitute for the first item (Figure 5a). However, usually people begin to consume immediately after the purchase and they combine labor and leisure time (Figure 5b). Thus, when the purchase of the second item happens this good is buying at a lower price because money balances have not been restored after the first purchase. Low-wage rate individuals cannot buy every day in upper price niches and they should come back to their convenient price niche. In this case the second item will be an imperfect substitute for the first item.

The last consideration is very important. It looks like it is a second item meets a particular need while the first item does not. The purchase of the first item has not completely satisfied that need and only the purchase of the second item has done it. Other words, the first item doesn't look totally necessary. This situation is well known. When the family goes to sales in order to choose a new suit for her head, they discover a luxury suit for a “reasonable price”. However, everybody understands that it is not reasonable to wear such a luxury suit every day, may be, only on weekends and parties. And the family buys another every day suit. It might happen at the same moment if a seller proposes a special discount for two suits, or two weeks later when the family discovers the ink spot on the luxury sleeve.

In addition, when the leisure time totally goes beyond the time horizon, i.e., the cycle of purchase (Figure 5a), the purchase of the first item looks even less necessary.

4. Comparative Statics of “Labor” and “Leisure” Models of Behavior

If we analyze the behavior of the utility function $U^* = U(Q^*, H^*)$ with respect to the optimal levels of consumption and leisure, i.e., to the levels that provide the equality of marginal costs of search to its marginal benefit in Equation (1.1) and with regard to changes in the wage rate and in the absolute value of marginal savings, we get the following results (Appendix):

$$\frac{\partial U^*}{\partial w} = \lambda \quad (11);$$

$$\frac{\partial U^*}{\partial |\partial P / \partial S|} = -\lambda \frac{w}{|\partial P / \partial S|} \quad (12)$$

We can use these results in order to understand the behavior of the indirect utility function $v(w, |\partial P / \partial S|)$:

$$dv(w, |\partial P / \partial S|) = dw \frac{\partial v}{\partial w} + d |\partial P / \partial S| \frac{\partial v}{\partial |\partial P / \partial S|} = 0;$$

$$\lambda dw - \lambda \frac{w}{|\partial P / \partial S|} d |\partial P / \partial S| = 0;$$

$$\frac{d |\partial P / \partial S|}{dw} = \frac{|\partial P / \partial S|}{w} \Rightarrow e_{|\partial P / \partial S|, w} = 1 \quad (13)$$

The analysis of Equation (13) discovers the nature of the indirect utility function that takes the form of a cubic parabola with the saddle point at $e_{|\partial P / \partial S|, w} = 1$ (Malakhov 2014c):

$$v(w, |\partial P / \partial S|) = v(w, |\partial P / \partial S|(w)) \quad (14.1)$$

$$\partial v / \partial w = \lambda(1 - e_{|\partial P / \partial S|, w}) \quad (14.2)$$

If we come back to the “labor model” of behavior we see that the increase in utility happens only with the decrease in the absolute value of marginal savings $|\partial P / \partial S|$ with respect to the wage rate. There are two possible scenarios of the decrease in marginal savings.

First, the decrease in marginal savings increases labor supply and reduces both search and leisure time. The vigorous propensity to search is used by individuals in order to substitute “bad” leisure for normal consumption (Figure 6):

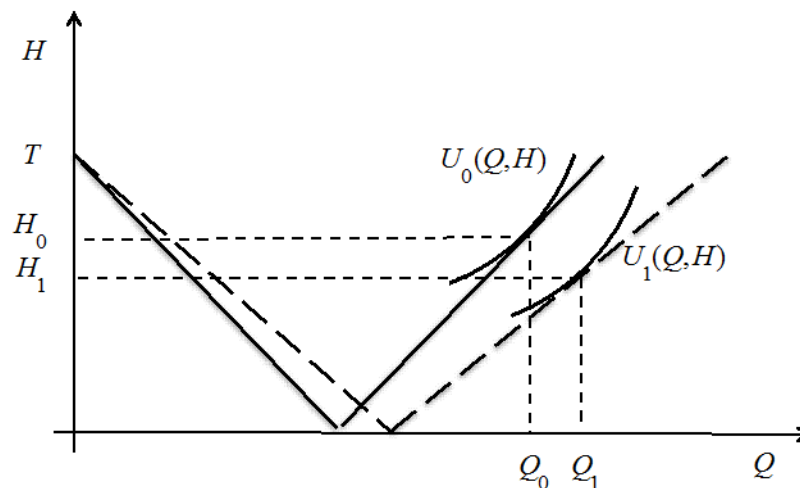


Figure 6. Substitution of “bad” leisure by normal consumption

We see that here individuals try to escape from “bad” leisure by increasing labor supply. However, if we follow the assumption of the diminishing efficiency of search ($\partial P / \partial S < 0$; $\partial^2 P / \partial S^2 > 0$), the lower $|\partial P / \partial S|$ value presumes the extended search but Figure 6 decreases the time of search in favor of labor time. It means that Figure 6 describes the vigorous propensity to search under the fall in prices that happens *externally*. And sales represent the best example that matches this *laborholic* type of behavior.

This type of behavior is well known. Moreover, sometimes it looks like the manifestation of conspicuous labor (Bellezza et al. 2014). Sales are organized for that kind of people because well-advertised sales save time of *laborholics* and keep their reputation of smart-shoppers. Today this tradition is well developed by online shopping. Sales happen occasionally but Internet gives a chance to get discounts permanently. Other words, Internet successfully, and the competition between search engines confirms it, exploits the smart-shopping behavior of *laborholics*. Unfortunately, and our favorite example of the table tennis bought on sales and got in a season its proper place in the garage confirms it, that kind of behavior leaves no time for consumption. It also seems that *laborholics* should suffer more than others from the habit to purchase meals when the refrigerator is not empty. And this is the fact of purchase and the following possession of a status item, a boat, may be, that becomes symbolic and in that sense conspicuous. This is the reason why sometimes the idea of the restriction on working hours seems to be an appropriate tool for the reduction of welfare losses of conspicuous consumption. However, the restriction on working hours stimulates the search and raises the level of “bad” leisure. Thus, the “labor model” of behavior becomes very close to the “leisure model” of behavior. It happens when “bad” leisure complements consumption (Figure 7):

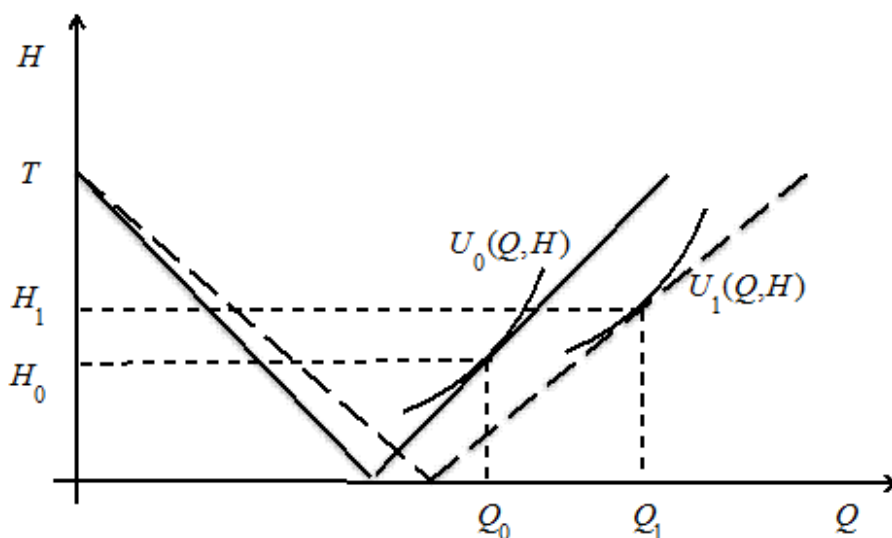


Figure 7. Complementarity of “bad” leisure with normal consumption

However, the resolution of the problem of the increase in utility under the complementarity of “bad” leisure with normal consumption needs very elastic demand. Indeed, the increase in utility happens here only when the increase in “bad” leisure is compensated by a more significant growth in consumption. But the need “to kill time” seems to be inappropriate attribute of the elastic demand. Here we should be concentrated on the **demand for elastic necessities**. While we can imagine that kind of behavior, for example, when an individual likes luxury suits but he dislikes parties where he can expose his fashionable wear, such cases can be used in the theory of games when a wife approves the purchase of a luxury suit for her husband because it will be put on for the theater but really they are neither representative nor frequent. Unfortunately, there is an evident example that produces this kind of behavior. This is the consumption of drinks and drugs (Hampson '02, K. 2002, West, S. E. and Parry, I. W. H. 2009).

The example of drinks when search for lower prices decreases labor supply and increases leisure time might serve as a distinction of the “labor model” from the same rule of allocation of time in the “leisure model”. Living at southwest, Frenchmen often visit their neighbors in order to buy cheap drinks. The example of drugs often hides that difference because sometimes search for drugs exhibits the search for high-price products, when, for example, marijuana is substituted for cocaine, and therefore it exposes the “leisure model” of behavior.

If we come back to Equations (11) and (12) we can see that the negative marginal utility of money λ of relatively excess money balances changes signs of both marginal utilities of money income MU_w and marginal savings $MU_{|\partial P/\partial S|}$. According to Equation (12) the negative marginal utility of money transforms the marginal disutility of marginal savings into the positive marginal utility. Thus, the negative marginal utility of money stimulates search for high prices with greater marginal savings on purchase. Moreover, this is the only way to increase the indirect utility $v(w, |\partial P/\partial S|(w))$ in Equation 14 (Malakhov 2014c) because the reduction

in marginal savings and therefore in price of purchase decreases the utility level. The “leisure model” of behavior produces Veblen effect (Figure 8):

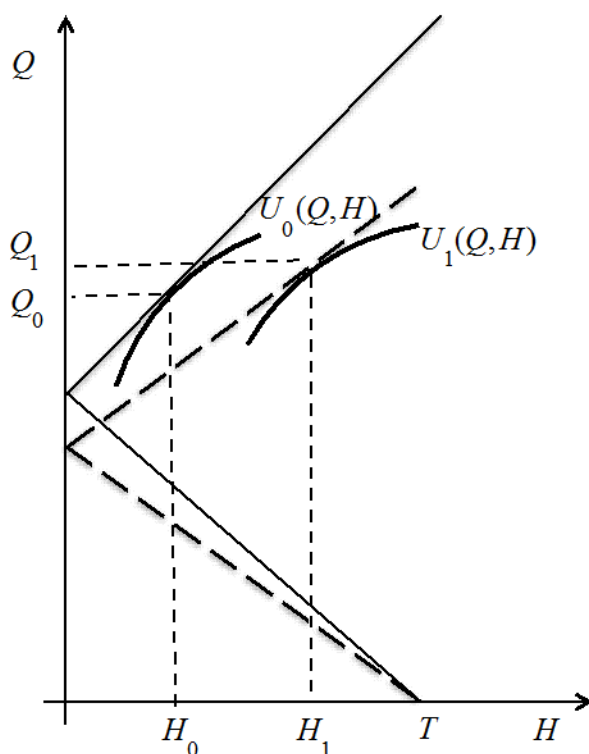


Figure 8. Veblen effect.

Here the increase in marginal savings and therefore in purchase prices, other words, the choice of a more luxury store, gives an opportunity to raise the utility level because the growth in “bad” consumption is compensated by the more significant extension in normal leisure.

There is no need to present examples of this kind of behavior but one important note should be done with regard to the difference between the time horizon, i.e., *the cycle of purchase*, and *the product lifecycle*. Let’s come back to our favorite example of the table tennis, which is left in the garage because a family buys darts. Indeed, when the consumption is “bad” individuals don’t buy products – they buy leisure time. Playing darts substitutes playing tennis. In this sense even our table tennis could be lucky if it is purchased after the boat – from the point of view of leisure time playing tennis substitutes boat trips.

5. Propensity to Search and Propensity to Produce at Home

When Aguiar and Hurst analyzed life-cycle prices they made an important assumption with regard to the price of time:

“The price of time is assumed to be the same for the shopper and the home producer, but does not necessarily equal a market wage...A household faces a static cost-minimization problem about whether to allocate time to shopping and home production or purchase market goods instead”.(Aguiar and Hurst 2007, p.1536)

In addition, they directly compared the price of time μ with marginal savings on purchase:

$$-\frac{\partial p}{\partial s} Q = \mu \quad (15)$$

This assumption has some important applications to the concept of the propensity to search. First, we can suppose that it is the propensity to search that adjusts the wage rate to the price of time, more precisely, to the price of leisure time. Field studies in economics of tourism and in economics of transportation also esteem the price of leisure as a fraction of the wage rate:

“Another common approach is to assume that the marginal value of leisure time is a fraction of the wage, with $\frac{1}{4}$ to $\frac{1}{2}$ often used in practice by reference to the value of time saved in transportation studies (e.g., Cesario 1976).” (Larson and Shaikh 2004, p.264).

We can see that if we take the value of the propensity to search for the “common model” of behavior as $\partial L/\partial S = -(L+S)/T$, it will corresponds to results of the most studies of the allocation of time where the share of non-leisure time is oscillating between $\frac{1}{4}$ and $\frac{1}{2}$. In addition, if the propensity to search adjusts the wage rate to the price of leisure in the “common model” of behavior, why it cannot do the same in the “leisure model” of behavior where the marginal utility of leisure is positive and therefore should have a positive price? If we follow this assumption we get that the price of leisure time in the “leisure model” of behavior is greater than the wage rate. This assumption can explain why people voluntarily substitute labor for leisure in the “leisure model” of behavior that reproduces the classical backward-bending labor supply curve.

Then we can come back to Aguiar and Hurst and develop their assumption saying that a **propensity to search**, i.e., to substitute labor for search, can take the form of a **propensity to produce at home**, i.e., to substitute labor for home production. Thus, the value of search S can take the form of home production, the price of purchase can represent the price of inputs for home production, and the value of marginal savings or the price reduction can be calculated with respect to the corresponding market price of a service or of a final product. Under this assumption the “common model” of behavior illustrates satisficing as well as rational choice of inputs and time for home production that leaves a chance to consume an output. And the value of the equilibrium price $P_e = w(L+S)$ as the equivalent of the **willingness to accept** gets an additional important confirmation because it really represents the market price, for example, of a meal prepared at home. On the other hand, an engineer who wants to make garden chairs himself and who thinks he gets a significant price reduction with regard to the market price of the garden furniture, might sell it if the price will cover not only costs of inputs and costs of production, but also costs of forgone leisure, or $P_e = w(L+S+H)$.

This is very difficult to assign some activities like gardening and even house maintenance to home production itself because they can also represent a form of leisure. When an activity is finished, individuals who like home production begin to do something else, leaving leisure time for consumption of the results of the previous activity for other days. And they begin to buy inputs for the new activity, may be, even new tools because a lovely organized tool storage in the garage that could be presented with proud to neighbors also have some residual symbolic value. Thus, the cycle of purchase of inputs for home production is really much shorter than the total lifecycle of a particular home activity. Activities can substitute each other and sometimes they are substituted by market purchases. It happens when an engineer mows only the lawn in front of the window, leaving the total surface of the garden to neighbor’s son.

It is interesting to get the retrospective view on allocation of time from the point of view of propensity to produce at home. When we make the comparison of the allocation of time in 1965 and in 2003 in the USA based on the data from Aguiar and Hurst (2007a), we see that during that period women increased the time for total market work – from 22.45 to 24.93 hours per week while they decreased the time for the total non-market work and child care – from 38.46 to 30.01 hours per week. And the leisure time was increased respectively by 5.97 hours per week. Hence, we could suppose that during that period women generally followed the “common model” of behavior. But when we take the data for men, we see the decrease in the total market work - from 51.58 to 39.53 hours per week and the increase in total non-market work and child care - from 11.11 to 16.67 hours per week. And the leisure time was increased by 6.49 hours per week. Hence, we could suppose that during that period men generally followed the “leisure model” of behavior. Of course, the use of such aggregates for the analysis of the propensity to search and the propensity to produce at home is not absolutely correct. It cannot provide us with grounds for definite conclusions but it could serve as a basis for some assumptions. Indeed, it seems that women are more balanced in every day economic activity; they make purchases in appropriate price niches, and they do at home only necessary things, while men often visit upper price niches where they buy unnecessary items, and at home they could be occupied with unnecessary activities.

6. Conclusion

The very profound analysis of welfare effects of conspicuous consumption and conspicuous/inconspicuous leisure, presented in Arrow and Dasgupta (2009), discovered different relationships of both consumption and labor supply with a social optimum. In particular, the combination of conspicuous consumption with inconspicuous leisure results in consumption and labor supply over the social optimum. That conclusion corresponds to properties of the “labor model” of behavior. Arrow and Dasgupta also paid attention to the ambiguity of a welfare effect when both consumption and leisure were conspicuous.

The paper presented here explains that ambiguity when it recognizes the possibility of visual resemblance of “labor” and “leisure” models of behavior. To make things divisible one needs to accept the relativity of the concept of the optimum quantity of money with respect to different consumption patterns and different living standards in order to explain the waste of money and therefore their negative marginal utility even on low social levels.

It seems that the paper of Arrow and Dasgupta (2009) on conspicuous consumption was not occasional because their participation in the earlier investigation of overconsumption (Arrow et al., 2004) discovered the real concern for the macroeconomic equilibrium of that one of the most outstanding duets of the modern economic thought. The idea of the vigorous propensity to search that can double the consumption shows that the concern for social welfare had serious reasons because this concept adds to the analysis of the equilibrium the problem of “bads”.

It is not surprisingly that the analysis of the equilibrium with “bads” often uses the example of garbage (Hara, 2005). That idea had cheerfully expressed the contrast between “common”, “labor”, and “leisure” models of behavior a year before Alfred Marshall published the first volume of his “Principles of Economics”:

“How many people, on that voyage, load up the boat till it is ever in danger of swamping with a store of foolish things which they think essential to the pleasure and comfort of the trip, but which are really only useless lumber. How they pile the poor little craft mast-high with fine clothes and big houses; with useless servants, and a host of swell friends that do not care twopence for them, and that they do not care three ha’pence for; with expensive entertainments that nobody enjoys...It is a lumber, man – all lumber! Throw it overboard...Let your boat of life be light, packed with only what you need – a homely home and simple pleasures, one or two friends, worth the name, someone to love and someone to love you, a cat, a dog, and a pipe or two, enough to eat and enough to wear, and a little more than enough to drink; for thirst is a dangerous thing.” (Jerome, 1889, pp.37-38)

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Appendix

The calculation of the marginal utility of money income and the marginal utility (disutility) of marginal savings uses the elasticity of the key equation of the model that provides the constraint to the problem of the maximization of utility:

$$w \frac{\partial L}{\partial S} = Q \frac{\partial P}{\partial S};$$

$$1 + e_{\partial L / \partial S, w} = e_{Q, w} + e_{\partial P / \partial S, w} \quad (16)$$

$$e_{\partial L / \partial S, \partial P / \partial S} = e_{Q, \partial P / \partial S} + 1 \quad (17)$$

A) Marginal utility of money income (18)

$$\begin{aligned} \frac{\partial U^*}{\partial w} &= \frac{\partial U}{\partial Q} \frac{\partial Q}{\partial w} + \frac{\partial U}{\partial H} \frac{\partial H}{\partial w} = \lambda \left[\frac{\partial P / \partial S}{\partial L / \partial S} \frac{\partial Q}{\partial w} - \frac{w}{\partial L / \partial S} \frac{\partial^2 L / \partial S \partial H}{\partial w} \frac{\partial H}{\partial w} \right] = \\ &= \lambda \left[\frac{\partial P / \partial S}{\partial L / \partial S} \frac{\partial w \partial L / \partial S}{\partial w} \frac{1}{\partial P / \partial S} - \frac{w}{\partial L / \partial S} \frac{\partial^2 L / \partial S \partial w}{\partial^2 L / \partial S \partial w} \frac{\partial^2 L / \partial S \partial H}{\partial w} \frac{\partial H}{\partial w} \right] = \\ &= \lambda \left[\frac{1}{\partial L / \partial S} \left(\frac{\partial L}{\partial S} + w \frac{\partial L / \partial S}{\partial w} \right) - e_{\partial L / \partial S, w} \frac{\partial^2 L / \partial S \partial H}{\partial^2 L / \partial S \partial w} \frac{\partial H}{\partial w} \right] = \\ &= \lambda \left[1 + e_{\partial L / \partial S, w} - e_{\partial L / \partial S, w} \frac{\partial^2 L / \partial S \partial H}{\partial^2 L / \partial S \partial w} \frac{\partial H}{\partial w} \right] \\ \frac{\partial^2 L / \partial S \partial H}{\partial^2 L / \partial S \partial w} \frac{\partial H}{\partial w} \Big|_{\text{common}} &= \frac{\partial^2 L / \partial S}{\partial H} \frac{\partial H}{\partial w} \frac{1}{\partial^2 L / \partial S \partial w} = \frac{\partial(H-T)/T}{\partial H} \frac{\partial H}{\partial w} \frac{1}{\partial((H-T)/T)/\partial w} = \\ &= \frac{\partial H / \partial w}{T} \frac{T}{\partial H / \partial w} = 1; \\ \frac{\partial^2 L / \partial S \partial H}{\partial^2 L / \partial S \partial w} \frac{\partial H}{\partial w} \Big|_{\text{leisure/labor}} &= \frac{\partial^2 L / \partial S}{\partial H} \frac{\partial H}{\partial w} \frac{1}{\partial^2 L / \partial S \partial w} = \frac{\partial(-H-T)/T}{\partial H} \frac{\partial H}{\partial w} \frac{1}{\partial((-H-T)/T)/\partial w} = \\ &= \frac{-\partial H / \partial w}{T} \frac{T}{-\partial H / \partial w} = 1; \\ \frac{\partial U^*}{\partial w} &= \lambda \left[1 + e_{\partial L / \partial S, w} - e_{\partial L / \partial S, w} \right] = \lambda \end{aligned}$$

B) Marginal utility (disutility) of marginal savings (19)

$$\begin{aligned} \frac{\partial U^*}{\partial(\partial P / \partial S)} &= \frac{\partial U}{\partial Q} \frac{\partial Q}{\partial(\partial P / \partial S)} + \frac{\partial U}{\partial H} \frac{\partial H}{\partial(\partial P / \partial S)} = \lambda \left[\frac{\partial P / \partial S}{\partial L / \partial S} \frac{\partial Q}{\partial(\partial P / \partial S)} - \frac{w}{\partial L / \partial S} \frac{\partial^2 L / \partial S \partial H}{\partial(\partial P / \partial S)} \frac{\partial H}{\partial(\partial P / \partial S)} \right] = \\ \text{when } \frac{\partial^2 L / \partial S \partial H}{\partial(\partial P / \partial S)} \frac{\partial H}{\partial(\partial P / \partial S)} &= \pm \frac{1}{T} \frac{\partial H}{\partial(\partial P / \partial S)} = \pm \frac{\partial((H-T)T)}{\partial(\partial P / \partial S)} = \frac{\partial(\partial L / \partial S)}{\partial(\partial P / \partial S)} \\ \text{then } \frac{\partial U^*}{\partial(\partial P / \partial S)} &= \lambda \left[\frac{\partial P / \partial S}{\partial L / \partial S} \frac{\partial Q}{\partial(\partial P / \partial S)} - \frac{w}{\partial L / \partial S} \frac{\partial(\partial L / \partial S)}{\partial(\partial P / \partial S)} \right] = \left[\frac{w}{Q} \frac{\partial Q}{\partial(\partial P / \partial S)} - \frac{w}{\partial L / \partial S} \frac{\partial(\partial L / \partial S)}{\partial(\partial P / \partial S)} \right] = \\ &= \lambda \frac{w}{\partial P / \partial S} \left[\frac{\partial P / \partial S}{Q} \frac{\partial Q}{\partial(\partial P / \partial S)} - \frac{\partial P / \partial S}{\partial L / \partial S} \frac{\partial(\partial L / \partial S)}{\partial(\partial P / \partial S)} \right] = \\ &= \lambda \frac{w}{\partial P / \partial S} \left[e_{Q, \partial P / \partial S} - e_{\partial L / \partial S, \partial P / \partial S} \right] = \lambda \frac{w}{\partial P / \partial S} (-1) = -\lambda \frac{w}{\partial P / \partial S} \\ \frac{\partial U^*}{\partial(\partial P / \partial S)} &= -\lambda \frac{w}{\partial P / \partial S} \text{ and} \\ \frac{\partial U^*}{\partial |\partial P / \partial S|} &= -\lambda \frac{w}{|\partial P / \partial S|} \end{aligned}$$



Analysis of the Economic Research Context after the Outbreak of the Economic Crisis of 2007-2009

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In this paper it, we have conducted a factor analysis which implied determining the international research directions that have characterized the period following the outbreak of the crisis in 2007 and 2008-2011. In this research, we used secondary data that were extracted from 342 articles, which were based on 665 individual researches. Following this research, we have identified three main research in the macroeconomic areas which explained 56% of all the analyzed research. Also, the results showed the trends in macroeconomic research after the start of the crisis in 2007.

Keywords: macroeconomics, meta-analysis, factor analysis, economic models, economic literature

JEL Classification: E0, E1, E2, E3, E4, E5

1. Introduction

Since 2007, the global economy has been going through an experience that showed the limits of prevailing economic models and that led to the destruction of the sense of confidence in the economic paradigm. From solving the models, there were several prescriptions that were obtained for the most of the economic downturns that have followed in the last century until the outbreak of the economic crisis of 2007-2009, which through its extent and magnitude has represented an event that cannot be compared to anything that has ever happened before, yet it contains all of them together, as Krugman previously stated (2008).

The new global economic mutations that occurred in 2007 after the outbreak of the crisis have had inevitable repercussions on the scientific activity in the macroeconomic study area. Starting from this aspect, we are interested in what the new trends of research in macroeconomics and how the scientific activity was influenced by the economic events of after 2007.

In this context, we use the factor analysis method to achieve the objectives that will be presented in the following section.

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Thus, in the first stage of this research, we will establish the main research questions, the purpose of the research, and its related objectives and hypotheses. Thus the main research question identified for this analysis is to provide detailed knowledge of the state of scientific research in the aftermath of the 2007-2008 crisis in macroeconomic theory.

2. Research Methodology

The purpose of research is to determine the research directions that have characterized the period following the crisis that broke in 2007, more specifically in the 2008-2011 timeframe. From this global purpose of the research the following objectives and their related hypotheses are derived:

Objective 1: Description of the research state based on descriptive statistics

Hypothesis 1: The core of the research state is concentrated mainly in the United States and Europe

Objective 2: Establishing a factor analysis of the research state in 2008-2011

Hypothesis 2: There are at least two main directions in terms of macroeconomic research in 2008-2011

Objective 3: Analysis of the main research directions resulted from factor analysis

Hypothesis 3: The main research directions resulted from the factor analysis are in a direct relationship with the events that followed the outbreak of the 2007-2008 crisis

In the next stage, we designed the study by identifying the necessary information sources and by establishing the methods used in compiling the information and the systematization of these information.

By identifying the sources of information for this research, we chose five international journals (American Economic Review, European Economic Review, Journal of Economic Theory, The Journal of Economic Literature and the Journal of Economic Perspectives). These sources of information were the basis of the information collection methods necessary to answer the research question, more precisely by to investigate of secondary sources from which we have extracted the studies that examined topics related to macroeconomic theory and monetary economics in the period 2008-2011.

Table 1. *The secondary sources used in researching the theoretical context*

Journal	Volumes considered for <i>researching the theoretical context</i>
American Economic Review	Vol. 98 (2008) – Vol. 101 (2011)
European Economic Review	Vol. 52 (2008) – Vol. 55 (2011)
Journal of Economic Theory	Vol. 139 (2008) – Vol. 146 (2011)
The Journal of Economic Literature	Vol. 46 (2008) – Vol. 49 (2011)
The Journal of Economic Perspectives	Vol. 22 (2008) – Vol. 25 (2011)

In order to obtain importance factors, each journal was evaluated based on six criteria for evaluation and classification used by ISI Thomson:

C1 - Total Citations

C2 - 5-year Impact Factor

C3 - Immediacy Index

C4 - Number of articles

C5 - Eigenfactor score

C6 – Article Influence score

Thus, for the five journals under investigation, the following data were extracted:

Table 2. *Classification criteria for journal importance*

Journal	JCR Data				Eigenfactor Metrics	
	Total Citations	5-year Impact Factor	Immediacy Index	Number of articles	Eigenfactor score	Article Influence score
Journal of Economic Theory	5.052	1.519	0.358	109	0.02628	2.421

European Economic Review	3.629	1.860	0.229	70	0.01212	1.774
American Economic Review	26.525	4.076	0.793	237	0.10039	5.662
Journal of Economic Literature	4.715	9.426	0.850	20	0.01696	9.820
Journal of Economic Perspectives	5.626	5.865	0.512	43	0.02773	6.799

For linearization, we calculated the relative values of the criteria based on the maximum identified amount for each criterion:

Table 3. Linearization of the journals' classification criteria

Journal	Total Citations	5-year Impact Factor	Immediacy Index	Number of articles	Eigenfactor score	Article Influence score
Journal of Economic Theory	0.19	0.16	0.42	0.46	0.26	0.25
European Economic Review	0.14	0.2	0.27	0.3	0.12	0.18
American Economic Review	1	0.43	0.93	1	1	0.58
Journal of Economic Literature	0.18	1	1	0.08	0.17	1
Journal of Economic Perspectives	0.21	0.62	0.6	0.18	0.28	0.69

To obtain weighted coefficients related to each criterion we used the FRISCO formula:

$$\beta = \frac{p + \Delta p + m + 0,5}{-\Delta p' + \frac{Ncrt}{2}}$$

where: p = the sum of points obtained for each line by a certain criterion

Δp = the difference between the considered score criterion and the score of the last criterion

m = the number of criteria that have a lower number of points than the considered criterion

Ncrt = the number of considered criteria

$\Delta p'$ = the difference between the considered score criterion and the score of the first criterion

Table 4 shows the weighted coefficients for each criterion, taking into consideration the importance of each criterion in relation to the other criteria. Thus, the C₁ (Total Citations) and C₂ (5-year Impact Factor) were considered to have a primary importance, whereas the other criteria have a secondary importance.

Table 4. Determining the coefficients related to the importance criteria of the journals

Criteria	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	Points	Level	Weight
C ₁	0.5	0.5	1	1	1	1	5	1	5.0
C ₂	0.5	0.5	1	1	1	1	5	1	5.0
C ₃	0	0	0.5	0.5	0.5	0.5	2	3	0.5
C ₄	0	0	0.5	0.5	0.5	0.5	2	3	0.5
C ₅	0	0	0.5	0.5	0.5	0.5	2	3	0.5
C ₆	0	0	0.5	0.5	0.5	0.5	2	3	0.5

Considering the data presented in the previous table, the journals were compared based on the identified and linearized criteria from table 3.

Table 5. Journals' importance factors

		Journal of Economic Theory		European Economic Review		American Economic Review		American Economic Literature		American Economic Perspectives	
Criterion	Weight	Values	Weight x Values	Values	Weight x Values	Values	Weight x Values	Values	Weight x Values	Values	Weight x Values
C ₁	5.0	0.19	0.95	0.14	0.70	1	5.00	0,18	0,90	0,21	1,05
C ₂	5.0	0.16	0.80	0.2	1.00	0.43	2,15	1	5,00	0,62	3,10
C ₃	0.5	0.42	0.19	0.27	0.12	0,93	0,42	1	0,45	0,6	0,27
C ₄	0.5	0.46	0.21	0.3	0.14	1	0,45	0,08	0,04	0,18	0,08
C ₅	0.5	0.26	0.12	0.12	0.05	1	0,45	0,17	0,08	0,28	0,13
C ₆	0.5	0.25	0.11	0.18	0.08	0,58	0,26	1	0,45	0,69	0,31
Importance factors		2.4		2.1		8.7		6.9		4.9	

In the previous table the importance factors for each journal were obtained and these factors were then used to rank the relevance and importance of each article, depending on the journal's origin.

Next, after the sources of information were identified, we established the methods of information extraction and systematization. Thus, in this research we used the following variables:

Table 6. Variables used in the research

V1. Journal	<ul style="list-style-type: none"> ➤ Journal of Economic Theory ➤ European Economic Review ➤ American Economic Review ➤ Journal of Economic Literature ➤ Journal of Economic Perspectives
V2. Article title	
V3. Article's authors	
V4. Article publication date	<ul style="list-style-type: none"> ➤ Month of article publication in the 2008-2011 period ➤ Corresponding month period was numbered successively from January 2008 (month 1) and until December 2011 (month 48)
V5. Authors' affiliated institution	
V6. Type of authors' affiliated institution	<ul style="list-style-type: none"> ➤ University ➤ Research institute ➤ Private ➤ Public ➤ Central bank ➤ BIS ➤ IMF ➤ World Bank
V7. Institution's region	<ul style="list-style-type: none"> ➤ United States; ➤ European Union – for institutions from the European Union, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom; ➤ International - for international financial institutions: Bank for International Settlements, International Monetary Fund, World Bank; ➤ Rest of the world - Australia, Chile, Israel, Switzerland, Turkey, Canada, China, Japan, Singapore.
V8. Institution's country	United States, European Union – for the EU's institutions, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Poland, Portugal, Spain, Sweden, United Kingdom; Bank for International Settlements, the International Monetary Fund, World Bank, Australia, Chile, Israel, Switzerland, Turkey, Canada, China, Japan, Singapore.
V9. Reference theme	E0 - General E1 - General Aggregative Models E2 - Macroeconomics: Consumption, Saving, Production, Employment, and Investment E3 - Prices, Business Fluctuations, and Cycles E4 - Money and Interest Rates E5 - Monetary Policy, Central Banking, and the Supply of Money and Credit E6 - Macroeconomic Policy, Macroeconomic Aspects of Public Finance, and General Outlook

V10. Scientific importance and relevance of article based journals' importance factors

Each article is classified in relation to its theme and receives an importance factor according to the following values:

- 0 – not referring to that topic/theme
- 2,1 – article published in *European Economic Review*
- 2,4 – article published in *Journal of Economic Theory*
- 4,9 – article published in *American Economic Perspectives*
- 6,9 – article published in *American Economic Literature*
- 8,7 – article published in *American Economic Review*

After data extraction, for the following stage, we considered the contribution of each author as an individual research before a collective research. Thus, each individual research was regarded as an observation in the analysis process, i.e. in the informational input.

Further, the secondary data of the research was extracted manually by analyzing the volumes published by the five international journals in 2008-2011. The extracted data represented the input information that has been transferred to a database further processed with statistical analysis software SPSS and Microsoft Excel to accomplish the purpose of research and its derived objectives and hypotheses.

For attaining the objectives and related hypotheses we followed this research methodology:

- (i) Obtaining descriptive statistics:
 - frequencies analysis of the studies based on the journal in which the article was published,
 - frequencies analysis of the studies based on the region of the institutions,
 - frequencies analysis of the studies based on the country of the institutions,
 - correspondence analysis of the research based on the region of the institutions and the institution's type,
 - frequencies analysis of the studies based on the theme of the research,
- (ii) Factor analysis on the topic of the studies carried out in 2008-2011.
- (iii) Analysis of the resulted components from the factor analysis.

3. Empirical Analysis and Results

3.1. Obtaining descriptive statistics

This first phase of the empirical analysis consisted in setting up the descriptive statistics based on the articles published in the macroeconomic field within the 5 international journals chosen for this study: American Economic Review, European Economic Review, Journal of Economic Theory, The Journal of Economic Literature, and The Journal of Economic Perspectives.

Thus, the table below shows the frequencies of the article publications in each journal:

Table 7. Frequencies analysis of the article publication for each journal

Journal	Article frequency	Percentage (%)	Cumulative percentage (%)
American Economic Review	157	45.91%	45.91%
European Economic Review	68	19.88%	65.79%
Journal of Economic Theory	66	19.30%	85.09%
The Journal of Economic Literature	23	6.73%	91.81%
The Journal of Economic Perspectives	28	8.19%	100.00%
Total	342	100.00%	-

Further, Table 7 shows these journals from the perspective of the research frequencies published between 2008 and 2011.

Table 8. Descriptive statistics regarding the journals used in the analysis of the theoretical context

Journal	Research frequency	Percentage (%)	Cumulative percentage (%)
American Economic Review	314	47,2	47,2
European Economic Review	143	21,5	68,7

Journal of Economic Theory	120	18,0	86,8
The Journal of Economic Literature	35	5,3	92,0
The Journal of Economic Perspectives	53	8,0	100,0
Total	665	100,0	

It is noted that 47.2% of the researches published between 2008 and 2011 were published in the American Economic Review. The distribution of the research published in journals included in the analysis can be seen in the following figure.

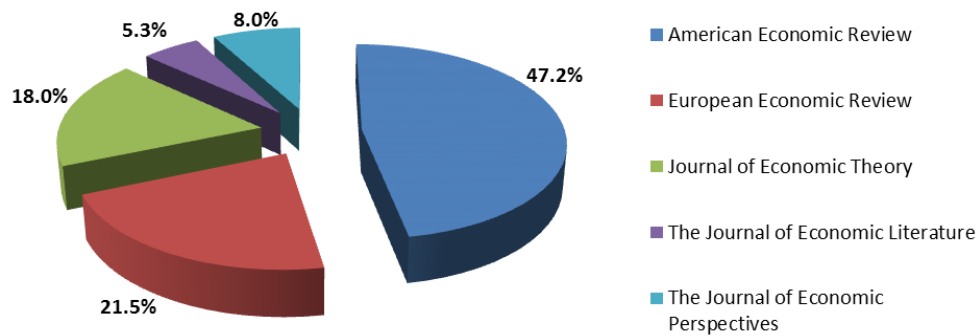


Figure 1. Research distribution according to the article's journal

Table 9 and Figure 2 show to the regions of provenance of the 665 researches considered in the context of the analysis for the period 2008 - 2011. It is observed that 62.9% of these studies are from the United States of America, and 27.7% are from the European Union.

Table 9. Descriptive statistics for the institutions' regions of provenance

Region	Research frequency	Percentage (%)	Cumulative percentage (%)
International	17	2.6	2.6
Rest of the world	45	6.8	9.3
European Union	185	27.8	37.1
United States	418	62.9	100.0
Total	665	100.0	

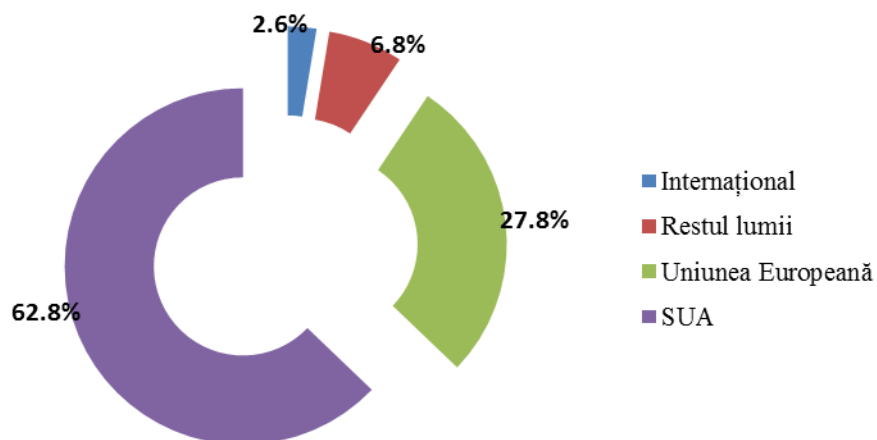


Figure 2. Distribution of research according to the region of provenance of the institutions

Table 10 shows the distribution of research according to the institutions' countries of provenance where the scientific work included in this analysis was conducted.

Table 10. Descriptive statistics on the countries of origin of the institutions used in the analysis of the theoretical context

Country	Research frequency	Percentage (%)	Cumulative percentage (%)
Australia	3	0.5	0.5
Austria	3	0.5	0.9
Belgium	4	0.6	1.5
Canada	18	2.7	4.2
Czech Republic	2	0.3	4.5
Chile	1	0.2	4.7
China	1	0.2	4.8
Denmark	4	0.6	5.4
Switzerland	11	1.7	7.1
Finland	4	0.6	7.7
France	16	2.4	10.1
Germania	13	2	12
International	17	2.6	14.6
Israel	4	0.6	15.2
Italia	25	3.8	18.9
Japan	3	0.5	19.4
The Netherlands	7	1.1	20.5
Poland	1	0.2	20.6
Portugal	4	0.6	21.2
Singapore	1	0.2	21.4
Spain	23	3.5	24.8
Sweden	7	1.1	25.9
Turkey	3	0.5	26.3
European Union	18	2.7	29
United Kingdom	54	8.1	37.1
US	418	62.9	100
Total	665	100	

Table 11. Descriptive statistics on the institution type of the researchers

Institution type	Research frequency	Percentage (%)	Cumulative percentage (%)
Central Bank	89	13.4	13.4
BIS	3	0.5	13.8
IMF	13	2	15.8
Research institute	19	2.9	18.6
Private	2	0.3	18.9
Public	21	3.2	22.1
University	517	77.7	99.8
World Bank	1	0.2	100
Total	665	100	

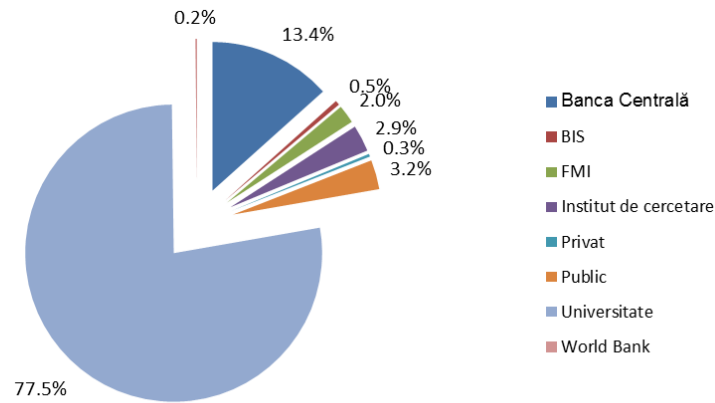


Figure 3. Distribution of studies based on the researchers' affiliation

Next we examined an analysis of the correspondence shown in Table 12 between the institution's region of origin and the institution's type. Correspondence analysis is a descriptive and exploratory technique used in this case to determine the correlation between the type of organization and its region, for the scientific research conducted during 2008-2011.

Table 12. Correspondence analysis between the region and type of the institution

Institution type	Region				
	US	EU	International	Rest of the world	Total
University	337	140	0	40	517
Research institute	9	9	0	1	19
Private	0	2	0	0	2
Public	17	4	0	0	21
Central Bank	55	30	0	4	89
BIS	0	0	3	0	3
IMF	0	0	13	0	13
World Bank	0	0	1	0	1
Total	418	185	17	45	665

From the previous table it is noted that 337 of the 665 studies (i.e. 50.68% of the total) were conducted by authors who come from United States academia. The second category, in terms of size, is represented by researchers from European Union academia, which totaled 140 scientific studies (i.e. 20.99% of the total), published as articles in the analyzed journals.

3.2. Factor Analysis on the Topic of the Studies Carried Out in 2008-2011

In this process, as a general linear model technique, factor analysis was used to reduce the number of variables of the research types conducted on the subject matter and the scientific importance of the studies, leading to obtain a limited number of main components, which represent the research directions that were addressed in the 2008-2011 framework.

Initially, a KMO test (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) was conducted to indicate the data adequacy to achieve the factor analysis. For the variables introduced in this analysis we obtained a value of 0.535 of the KMO test therefore factor analysis is relevant, because this value is higher than the 0.5 acceptable threshold.

Table 13. Communalities for each examined variable

Variable	Initial	Extraction
E0	1.000	0.348
E1	1.000	0.429
E2	1.000	0.727
E3	1.000	0.533
E4	1.000	0.551
E5	1.000	0.588
E6	1.000	0.743

Table 13 shows the common variance of each variable analyzed (communalities) and presents the common level before and after the extraction of factors. Principal components analysis is based on the initial assumption that all variance is common, therefore, before extracting the factors, all variables have a variance factor equal to 1 (as seen in the column labeled Initial). All variance associated with a variable is accepted as common variance. The values in the Extraction column represent the extent to which a variable's variance is common to the variance of the extracted factor, more specifically of the newly created variable.

All values after factor extraction are high, indicating that all extracted components reflect the variables included in the factor analysis. Also, it is noted that variables E2 and E6 denote the highest variance (72.7% for E2 and 74.3% for E6) which are transposed onto the newly created factors that include these variables.

After establishing the variance transposed to the newly formed factors, factor analysis involves two stages: extraction of the factors (using principal components analysis method) and then rotation of the factors (using Varimax method) to assist in interpretation.

In Table 14, it is noted that the factor analysis developed three new variables or extracted factors, because this analysis was framed under the Kaiser criterion, which retains only factors with Eigenvalues greater than 1.

Table 14. Total variance explained for the 3 extracted factors

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.608	22.969	22.969	1.608	22.969	22.969	1.390	19.857	19.857
2	1.194	17.057	40.026	1.194	17.057	40.026	1.346	19.232	39.089
3	1.118	15.965	55.991	1.118	15.965	55.991	1.183	16.903	55.991
4	0.978	13.977	69.969						
5	0.809	11.559	81.528						
6	0.679	9.695	91.223						
7	0.614	8.777	100.000						

Table 13 shows the number of selected factors (in this case, three factors) and the variance in each new variable, before and after rotation.

In the first section of the table entitled 'Initial eigenvalues', the 'Total' column indicates the amount of variance of the original variables explained by each component. Thus, further, only the first three factors will be considered because they display Eigenvalues greater than 1. The second column of the first section (% Variance) presents the Eigenvalues in terms of the percentage of explained variance of the total variance of all the variables included in the analysis. Column 'Cumulative %' shows the cumulative percentage for the first n components of the factor analysis.

The second section of the table ('Extraction Sums of Squared Loadings') presents the extracted components that exhibit three factors that explain 55.99% of the variability of the seven original variables.

The third section of the table ('Rotation Sums of Squared Loadings') involves applying the Varimax rotation method, whereby the cumulative percentage of variance explained by the extracted components is maintained (55.99%), but the variance is propagated more equally on other components. Before rotation, the first factor explains 22.969% of the total variance, but after rotation (the final part of the table labeled 'Rotation Sums of Squared Loadings') the first factor explains 19.857% of the total variance. Therefore, the rotation has the effect of optimizing the factor's structure and the immediate consequence of this is the equivalence of the relative importance of the factors.

Table 'Matrix of rotated components' helps to determine the representativeness of the components by showing which variables have the highest influence on each of the three newly formed factors.

Table 15. Matrix of rotated components

	Components		
	F1	F2	F3
E0	-0.562	0.118	0.133
E1	0.557	0.342	0.050
E2	0.302	-0.792	0.096
E3	0.718	0.000	0.133
E4	0.127	0.319	0.658
E5	0.364	0.661	0.137
E6	0.096	0.222	-0.827

Following the factor analysis conducted in this study, we obtained three principal components, namely three directions of research carried out in the 2008-2011 period:

F1 - the first research direction relates to the studies that approached the interaction of general aggregated models with economic fluctuations and prices and dealt less with general aspects of macroeconomics

F2 - second direction is characterized by the research that approached monetary policy and money supply and did not address real variables (consumption, savings, production, employment, and investment)

F3 - the third direction encompasses studies regarding currency and interest rates which did not address macroeconomic policies and macroeconomic aspects of public finances.

În urma analizei factoriale realizate, rezultă trei componente principale, respectiv trei direcții ale cercetărilor realizate în perioada 2008-2011:

- F1 – prima direcție se referă la abordarea cercetărilor din perspectiva unei interacțiuni a modelelor agregate generale cu fluctuațiile economice and ale prețurilor and mai puțin la abordarea generală a macroeconomiei
- F2 – a doua direcție este caracterizată de abordarea în cadrul cercetărilor a politicii monetare and a ofertei de monedă and nu tratează variabilele reale (consum, economii, producție, ocuparea forței de muncă and investiții)
- F3 – a treia direcție este caracterizată de abordarea monedei and a ratelor dobânzii and nu tratează politicile macroeconomice and aspectele macroeconomice ale finanțelor publice.

3.3. Analysis of the Resulted Components from the Factor Analysis

The first factor (F1) is formed by the following subdomains E0 – ‘General’, E1 – ‘General Aggregative Models’ and E3 – ‘Prices, Business Fluctuations, and Cycles’. E3 denotes the highest score of 0.718 which appears in the development of the first factor, accounting for articles that address:

- general aspects regarding prices, business fluctuations, and cycles (E30);
- price level, inflation, deflation (E31);
- business fluctuations and cycles (E32);
- forecasting and simulation: models and applications (E37);
- other articles in this macroeconomics sphere (E39).

Variable E1 – ‘General Aggregative Models’ presents a score of 0.557 influencing in a positive way the first factor which consists of articles that approach:

- general theoretical and empirical studies about issues related to aggregative models (E10);
- aggregative models that cover the Marxian, Sraffian, Institutional, and Evolutionary schools (E11);
- research surrounding Keynes’s general theory, Keynesian and post- Keynesian macroeconomics (E12);
- neoclassical models (E13);
- forecasting and simulation of aggregative models (E17);
- other articles in this topic of general aggregative models (E19).

The second factor (F2) consists of two variables E2 and E5, but the scores of these two variables indicate that scientific research mainly focused on issues related to monetary policy, central banks and money supply (E5 = 0.661), and they were less related to the real macroeconomic variables (consumption, saving,

production, employment and investment), due to it negative registered score ($E2 = -0.792$). Thus, research in the 2008-2011 period addresses:

- general aspects of monetary policy, central banking, and the supply of money and credit (E50);
- money supply, credit, and money multipliers (E51);
- monetary policy (E52);
- central banks and their policies (E58);
- other related themes to this area (E59).

It should also be noted that in these studies, there were not included themes from the area of variable E2 (real macroeconomic variables: consumption, saving, production, employment and investment), such as:

- general aspects(E20);
- consumption, saving, wealth (E21);
- capital, investment (including inventories and capital), capacity (E22);
- production (E23);
- employment, unemployment, wages, intergenerational income distribution, aggregate human capital (E24);
- aggregate factor income distribution (E25);
- informal economy and underground economy (E26);
- forecasting and simulations of models and applications of this real environment (E27);
- other research in this category (E29).

The last factor (F3) presents the research context dealing with themes of currency and interest rates ($E4 = 0.658$), but lacks in studies that fall under the E6 variable (macroeconomic policy, macroeconomic issues of public finance, and general outlook). This lack of theoretical context is highlighted by a negative score of -0.827 for variable E6. In this category are also included articles that did not approach topics such as:

- general aspects of macroeconomic policy and public finance (E60);
- policy objectives, designs and projections of policies and their consistency in time, policy coordination (E61);
- fiscal policy, public expenditures, investment, finance and taxation (E62);
- comparative or joint analysis of fiscal and monetary policy, economic stabilization, treasury (E63);
- incomes Policy, price policy (E64);
- studies of particular macro- policy episodes (E65);
- general macroeconomic outlook and conditions (E66);
- other aspects of this field of research (E67).

However, the examined studies have made numerous references to the E4 theme, namely ‘Money and Interest Rates’, with the following subcategories:

- general aspects related to money and interest rates (E40);
- demand for money (E41);
- monetary systems, standards, regimes, government and the monetary system, payment systems (E42);
- determination of interest rates, term structure of interest rates (E43);
- financial markets and the macroeconomy (E44);
- forecasting and simulation of money demand and/or interest rates (E47);
- other topics related to money and interest rates (E49).

Table 16 shows the weights to be used in obtaining the factor scores by multiplying the coefficients from this table with the standardized variables of the analysis.

Table 16. Coefficient matrix of factor scores

	Components		
	F1	F2	F3
E0	-0.438	0.141	0.152
E1	0.374	0.202	-0.012
E2	0.294	-0.634	0.088
E3	0.521	-0.075	0.059
E4	0.012	0.206	0.542
E5	0.193	0.461	0.066
E6	0.112	0.189	-0.723

The factors represent linear combinations of the original variables that can be calculated as follows:

$$F_i = W_{i1}X_0 + W_{i2}X_1 + W_{i3}X_2 + \dots + W_{ik}X_k$$

$$F_1 = -0.438E_0 + 0.374E_1 + 0.294E_2 + 0.521E_3 + 0.012E_4 + 0.193E_5 + 0.112E_6$$

$$F_2 = 0.141E_0 + 0.202E_1 - 0.634E_2 - 0.075E_3 + 0.206E_4 + 0.461E_5 + 0.189E_6$$

$$F_3 = 0.152E_0 - 0.012E_1 + 0.088E_2 + 0.059E_3 + 0.542E_4 + 0.066E_5 - 0.723E_6$$

The results obtained by calculating factors based on the data used, according to the region and type of the institute are shown in Table 17.

Table 17. Factor values in relation to region and institution type

		Region				
		US	EE	International	Rest of the world	
Institution type	University	0.178	-0.191	0.000	-0.188	F1
		-0.043	-0.043	0.000	-0.141	F2
		0.066	-0.191	0.000	0.095	F3
		24.92	24.06	0.00	23.67	Data
	Research institute	-0.111	-0.347	0.000	-0.748	F1
		-0.151	0.056	0.000	0.161	F2
		0.189	-0.091	0.000	0.274	F3
		30.56	24.22	0.00	40.00	Data
	Private	0.000	-0.340	0.000	0.000	F1
		0.000	-0.152	0.000	0.000	F2
		0.000	-0.897	0.000	0.000	F3
		0.00	32.00	0.00	0.00	Data
	Public	-1.399	-0.425	0.000	0.000	F1
		-0.058	0.120	0.000	0.000	F2
		-1.399	0.323	0.000	0.000	F3
		20.88	36.00	0.00	0.00	Data
	Central Bank	0.129	-0.135	0.000	0.067	F1
		0.148	0.591	0.000	0.433	F2
		0.215	-0.129	0.000	-0.724	F3
		25.80	16.00	0.00	19.00	Data
	BIS	0.000	0.000	0.313	0.000	F1
		0.000	0.000	-0.187	0.000	F2
		0.000	0.000	0.170	0.000	F3
		0.00	0.00	11.00	0.00	Data
	IMF	0.000	0.000	0.080	0.000	F1
		0.000	0.000	0.126	0.000	F2
		0.000	0.000	-0.824	0.000	F3
		0.00	0.00	29.54	0.00	Data
	World Bank	0.000	0.000	-0.018	0.000	F1
		0.000	0.000	-1.601	0.000	F2
		0.000	0.000	0.060	0.000	F3
		0.00	0.00	30.00	0.00	Data

Based on the table presented above, Figure 4 presents visually the evolution of the studies in relation to their topic, more specifically to the resulted components of the factor analysis:

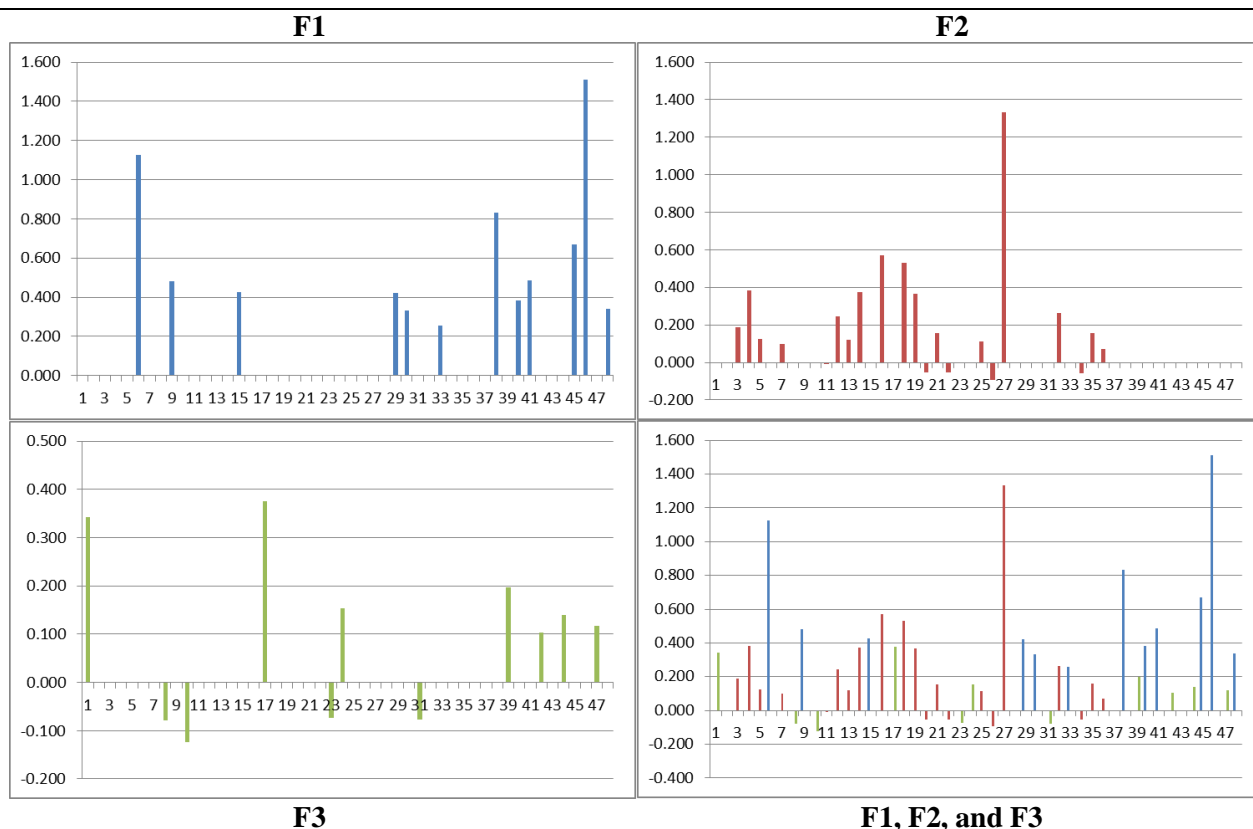


Figure 4. Evolution of research in the 2008-2011 period, in relation the obtained components

As seen in the first part of the analyzed period (2008-2009, months 1-24 of the analysis period) the F2's studies prevailed (which addressed monetary policy), and second examined period (2010-2011, months 25-48 of the analysis period) the F1's studies were the most predominant (which addressed economic fluctuations and macroeconomic models). Regarding the F3 component, these researches were intertwined with the other two components in the all the analyzed periods.

4. Conclusion

Through this secondary research, the present study sought to group, on research directions, state of scientific research in macroeconomic theory, in the period that followed the outbreak of the 2008-2009 crisis considering the research published between 2008 and 2011, taking into account five international journals (American Economic Review, European Economic Review, Journal of Economic Theory, The Journal of Economic Literature, and The Journal of Economic Perspectives).

The results of the study consist of the existence of three main directions in scientific research in 2008-2011.

The first direction refers to studies that addressed general aggregative models with economic fluctuations and prices, but did not encompass general macroeconomic aspects: Barnett and Bhattacharya (2008), Termin (2008), Justiniano and Primiceri (2008), Barillas, Hansen and Sargent (2009), Chetty et al. (2011).

The second direction is characterized by the researches that approached monetary policy and money supply, however these studies did not address the real variables of macroeconomics (consumption, savings, production, employment, and investment): Blinder and Morgan (2008), Besley, Meads and Surico (2008), Gaspar, Pérez Quirós and Rodríguez Mendizábal (2008), Benoît (2008), Buffie et al (2008), Ravenna and Walsh (2008), Berger, Ehrmann and Fratzscher (2008), Blinder et al (2008), Badinger (2009), Shleifer and Vishny (2010), Rose (2010), Blinder (2010), Feldstein (2010), Sanches and Williamson (2010), James and Lawler (2011), Engel (2011).

The third direction is characterized by studies that examined money and interest rates, but did not address macroeconomic policies and macroeconomic aspects of public finance: Caballero, Farhi and Gourinchas (2008), Favero and Giavazzi (2008), Kikuchi (2008), Ferraris and Watanabe (2008), Stulz (2009),

Lagos, Rocheteau and Weill (2009), Reinhart and Rogoff (2012), Hoffmann and MacDonald (2009), Kannan (2009), Koepl and MacGee (2009), Martin (2009), Gollier (2009), Wright (2010), Engel and West (2010), Fleming, Hrun and Keane (2010), Greenwood and Vayanos (2010), Piazzesi and Schneider (2010), Ferraris (2010), Jouini, Marin and Napp (2010), Arellano and Heathcote (2010), Gomis-Porqueras and Peralta-Alva (2010), Shy and Wang (2011), Reinhart and Rogoff (2011), Chudik and Fratzscher (2011), Korinek (2011), Schmeling and Schrimpf (2011), Tirole (2011), Sanches (2011), Ferraris and Watanabe (2011), Krusell, Mukoyama and Smith Jr. (2011), Kamiya and Shimizu (2011).

The analyses conducted to accomplish the main purpose of the secondary research are relevant in the presented context, but there are some limitations and criticisms related to secondary research. The most important criticism concerns to the subjectivity of the research, particularly the inclusion and investigation of a limited number of economic scientific journals.

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