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CONTENT

Title and Author/s	Page
1. Employment of foreigners in enterprises <i>Mahmut Kabakci, Arzu Hacioglu.....</i> DOI: 10.17261/Pressacademia.2018.992 JBEF- V.7-ISS.4-2018(1)-p.325-331	325-331
2. Selfless or skeptical consumer? <i>Aysel Ercis, Bilal Celik.....</i> DOI: 10.17261/Pressacademia.2018.993 JBEF- V.7-ISS.4-2018(2)-p.332-339	332-339
3. Does sentiment affect capital structure decisions? <i>Efe Caglar Cagli, Elif Korkmaz, M. Banu Durukan.....</i> DOI: 10.17261/Pressacademia.2018.994 JBEF- V.7-ISS.4-2018(3)-p.340-345	340-345
4. Do foreign direct investment in Ivory Coast increase CO₂ emissions? <i>Maxime Tano Assi.....</i> DOI: 10.17261/Pressacademia.2018.995 JBEF- V.7-ISS.4-2018(4)-p.346-358	346-358
5. Employer's liability regarding domestic workers and their occupational health and safety in Turkey <i>Gizem Saribay Ozturk.....</i> DOI: 10.17261/Pressacademia.2018.996 JBEF- V.7-ISS.4-2018(5)-p.359-364	359-364
6. Ruin probabilities in dependent insurances with autoregressive model <i>Elif Makhbule Cekici, Sami Ozcan, Hasan Durmus.....</i> DOI: 10.17261/Pressacademia.2018.997 JBEF- V.7-ISS.4-2018(6)-p.365-375	365-375
7. Are central bank reserves an important instrument for stability in exchange rates? <i>Yunus Acci.....</i> DOI: 10.17261/Pressacademia.2018.998 JBEF- V.7-ISS.4-2018(7)-p.376-381	376-381



EMPLOYMENT OF FOREIGNERS IN ENTERPRISES

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ABSTRACT

Purpose- Purpose of this study is to present the legal requirements of hiring foreign employees in Turkey.

Methodology- The topic will be examined within the frame of new legislation on the work permits of foreigners.

Findings- In 2016, Turkish lawmaker enacted new legislation numbered 6735. The Law numbered 6735 introduces new concepts such as preliminary permission, turquoise card etc. Main motive behind this change is to bring qualified labour force and labour capital into Turkey on one hand; to facilitate high skilled foreigners' work permit applications on the other hand.

Conclusion- Law numbered 6735 is a product of a policy change regarding the entrance of foreign labour force into Turkish market.

Keywords: Foreigner, work permit, exemption of work permit, turquoise card, preliminary permission.

JEL Codes: K31, K37, K38

1. INTRODUCTION

The increase of foreign labour force into Turkish labour market is a well-known fact. Statistics published by the Ministry of Family, Labour and Social Services support this phenomenon. According to these statistics, number of work permits given in 2011 was 17.446 and increased to 32.279 in 2012. Although there was no such leap between the consecutive years' statistics, the number has continued to increase. In the latest statistics of 2016, this number has reached to 73.560 (see. <https://www.csgeb.gov.tr/media/7315/yabancilarin%C3%A7ali%C5%9Fma%C4%B0z%C4%B0nler%C4%B0-2016.pdf>).

One of the reasons behind this increase is the rise of the foreign capital enterprises operating in Turkey. Such companies tend to employ foreigners especially in the field of management or other specialization-required fields. However, this kind of employment may contain legal risks, as the foreign employment requires certain legal procedures under Turkish law.

Recently, Turkish lawmaker enacted legislation in 2016 to bring qualified foreign labour into the country and to promote foreign capital to operate in Turkey by way of providing legal convenience regarding foreign employment with the Law numbered 6735 on the International Labour Force (O.J. 13.08.2016, 29800). The law in question abolished the Law numbered 4817 on the Work Permits of Foreigners (O.J. 06.03.2003, 25040) with the purpose of determining policy on a new international labour force. With this study, legal regime of the foreign employment in enterprises will be assessed under the Law numbered 6735.

2. THE TERM OF "FOREIGNER"

There is no doubt regarding foreigners to have right to work, as the art.49 of Turkish Constitution ensures the right to work as every persons' right and duty. Nevertheless, art.16 of the Constitution creates a margin for lawmaker to regulate the foreigners' fundamental rights and freedoms outside the general restriction regime of the fundamental rights and freedoms: The fundamental rights and freedoms of foreigners may only be restricted by law in accordance with international law. As in all over

the world, foreigners' right to work is restricted by law in our country, too. First, employment of foreigners is subject to work permit. Moreover, certain professions and occupations are allotted only to Turkish citizens.

The idea behind the restriction of foreigners' right to work is to protect citizens' right primarily (Lordoğlu, 2007: 21). Restriction on the employment of the foreigners is a common measure taken by almost every state to prevent unemployment of its citizens (Marhold, Franz/Friedrich, Michael, 2012: 5-26; Koch, 2015: 197 ff; Geiser, Thomas/ Müller, Roland, 2012: 99). In addition, the concern for the decrease in wages constitutes a basis for the restriction (Lordoğlu, 2007: 21).

As it is stated above, who are the "foreigners" whose right to work is restricted under Turkish law? In Turkish Law, foreignness is a qualification that can be considered for legal persons as well as real persons (Çelikel/ Öztekin Gelgel, 2017: 16). However, since this study is exclusive to foreign employment, the concept will be discussed here only in terms of real persons.

Foreignness could be defined in the light of citizenship (Çelikel/ Öztekin Gelgel, 2017: 16). Persons who are not the citizen of a country they reside are called "foreigner" (Ekşi, 2016: 40). In line with this, persons who do not possess Turkish citizenship are considered foreigners. This definition is literally accepted in the Law on International Labour Force (Law no. 6735, art. 3/ I/ ı). Stateless persons (heimatlos), refugees, asylum seekers etc. are also regarded as foreigners as well as persons who have foreign citizenship (Ekşi, 2016: 41; Çelikel/ Öztekin Gelgel, 2017: 16).

Having said that, there is a group of foreigners treated same or similarly to Turkish citizens. One of them is the foreigners and their descendants that are in the scope of art.28 of Law numbered 5901 (O.J. 12.06.2009, 27256). Those are the foreigners who had been Turkish citizens by birth but lost it by obtaining a renunciation permit. They are known as *blue cardholder* as this card is issued on their demand. Foreigners belong to this group are regarded privileged foreigners (For definition see. Çelikel/ Öztekin Gelgel, s. 189). Another group that could be defined as privileged is foreigners having Turkish descent. Similarly, citizens of Turkish Republic of Northern Cyprus and EU member countries are qualified as privileged foreigners. The privileges given to these foreigners will be explained in the relevant sections.

3. GENERAL REGULATION REGARDING EMPLOYMENT OF FOREIGNERS AND ITS SCOPE

Work permits, and exemption of work permits to be issued to foreigners are generally regulated under the Law on International Labour Force numbered 6735. However, either bilateral or multilateral treaties which Turkey is a party to or other acts may contain provisions regarding prohibition or exemption of foreign employment. Actually, art.2 of the Law no. 6735 refers such provisions, hence reveals the patch worked nature of the relevant regulations.

Article 2 of the Law no. 6735 covers the foreigners who apply to work in Turkey either dependently or independently. However, the scope of the regulation is not limited to this. Law no. 6735 also covers foreigners wishing to undertake vocational training or internship. The Law also covers cross-border service providers who plan to stay in Turkey temporarily to render service. In addition to these, employers who employ foreigners are within the scope of Law, concerning their obligations.

Foreigners who had been Turkish citizens by birth but lost it by obtaining a renunciation permit and their descendants are out of scope of the Law no. 6735. In fact, relevant provision of Law no. 5901 states that these foreigners are to enjoy rights granted to Turkish citizens- with certain exceptions. Exceptions counted in art.28 of Law no. 5901 do not contain right to work. Yet, to prevent hesitation, Law no. 6735 reserved the right of foreigners who had been Turkish citizens by birth but lost it by obtaining a renunciation permit by a clear provision (Law no. 6735 art.6/ IV, also see the motive of the legislation draft <http://www2.tbmm.gov.tr/d26/1/1-0727.pdf>). It is necessary and sufficient for those to present the blue cards given to them when enjoying their rights.

Foreigners who had been Turkish citizens by birth but lost it by obtaining a renunciation permit cannot be employed as civil servant but may work as worker or contracted personnel in public institutions under public law regime (Law no. 5901 art.28/ III).

4. PRINCIPLE: WORK UNDER WORK PERMIT OR EXEMPTION OF WORK PERMIT

4.1. In General

Foreigners within the scope of Law numbered 6735 are prohibited to work or to be employed in Turkey without work permit (Law no. 6735 art.6/II). This prohibition has been imposed for those who work independently on their own behalf as well as the dependent employees working with the employment contract. Moreover, the law requires even foreigners who are exempted of obtaining work permit to follow a procedure and document the exemption (Law no. 6735, art.13). In our country, where the phenomenon of undeclared work is quite common, we believe that this obligation has been introduced as a means of combating undeclared work in foreign employment.

As stated above, foreigners within the scope of art.28 of Law no. 5901 have right to work without work permit or exemption of work permit as they fall outside the scope of the Law no. 6735. Also, in the case of specific provisions in international treaties, which Turkey is party to provisions in the treaties prevail Law no. 6735.

Refuges and persons who are under subsidiary protection status defined in the Law numbered 6458 on Foreigners and International Protection (O.J. 11.04.2013, 28615), may work dependently or independently in Turkey from the moment they acquired the said status. The identity card issued to these persons is deemed as work permit (Law no. 6458 art.89/ IV/ b).

4.2. Work Permit

4.2.1. Types of Work Permits

Law no. 6735 counts five different work permits: work permit for a definite period, permanent work permit, freelance work permit, exceptional work permit and the turquoise card (for the argument that Law no. 6735 lists 4 kinds of work permit see. Ergin, 2016: 113). If we put aside the freelance work permit, the main principle is foreigners to apply for a definite-period work permit. On the first application, work permits are given for a maximum of one year, as long as they do not exceed the duration of the employment contracts. The work permits are granted on the condition that the foreigner to work in a particular workplace of an employer or to work in a specific job in various workplaces of an employer in the same sector (Law no. 6735, art.10/ I). It is possible to exceed the duration of work permit. In the first application for extension maximum two years of permit is granted, for the following extension applications maximum period for work permit is three years. Nevertheless, when the applicant wishes to work for a different employer, application for extension is evaluated as it is the first application for work in Turkey, therefore maximum one year of permit can be granted (Law no. 6735, art.10/ II).

Permanent work permit could be granted to the foreigners who are long-term residence permit holders or who have at least eight years of legal work permit (Law no. 6735, art.10/ III). Foreigners who obtain a permanent work permit benefit from the rights granted to Turkish citizens, unless otherwise is provided. However, those persons cannot be appointed for civil service duty (Law no. 6735, art.10/ IV).

The implementation of turquoise card is introduced for the first time with Law no. 6735 with the intent of gaining high skilled labour and to increase competitiveness of Turkey at international level. This permit is a facilitated work permit (see the motive of the legislation draft <http://www2.tbmm.gov.tr/d26/1/1-0727.pdf>) and aims to provide permanent work permit to foreigners with certain qualifications (Law no. 6735, art.11/ IV). Unlike the permanent work permit, a 3-year transition period is required. Applicants who are assessed as qualified workforce due to their educational level, wage, professional experience, contribution to science and technology etc. or assessed as qualified investor due to their contribution to science and technology, their level of investment or export value, volume of employment they provide or scientists and researcher who have internationally recognized studies in the academic area, and those distinguished in science, industry and technology, areas of which deemed strategic from the point of our country or internationally reputed for their successes in cultural, artistic or sports activities or contributing the recognition or publicity of Turkey or its culture internationally, acting in favour of the matters concerning Turkey's national interests are regarded as qualified foreigner (Law no. 6735, art.11/ V).

Exceptional work permit is permit which enables to make an exception for foreigners due to their qualifications in terms of procedure, evaluation or duration of the work permits (Çelikel/ Öztekin Gelgel, 2017: 198). Foreigners who could be granted exceptional work permit are counted in art.16 of Law no. 6735. According to this, foreigners who are regarded as qualified labour or investor; foreigners having Turkish descent; foreigners who are citizens of Turkish Republic of Northern Cyprus and EU member countries; foreigners who are married to a Turkish citizen and live in a marriage union with their spouse in Turkey; foreigners who are applicant of international protection; conditional refugee; provided provisional international protection or heimatlos pursuant to Law no. 6458 could benefit from these exceptions.

4.2.2. Preliminary Permission

Law no. 6735 which is adopted to bring high skilled labour force in our country, has imposed an obligation of obtaining "preliminary permission" for the foreigners who are to work in certain professions require occupational competence and expertise.

Professions and the sectors require preliminary permission are counted in art.8 of Law no. 6735. According to this provision, for health services Ministry of Health, for education services Ministry of National Education are authorized for granting preliminary permission. The Ministry of Family, Labour and Social Services determine professions that require preliminary permits on the positive opinion of the above-mentioned ministries.

Foreign faculty members who are to work in accordance with art.34 of Higher Education Law No. 2547 (O.J. 06.11.1981, 17506) are also subject to preliminary permission. Accordingly, the Council of Higher Education is authorized for the permit (Law no. 6735, art.8/ IV).

There is also preliminary permission requirement for foreigners who are working as research and development personnel in companies with the Certificate of R&D Center under Law no. 5746 (O.J. 12.03.2008, 26814). It is stated in art.8 of Law no. 6735 that such persons' application for work permit are evaluated on the positive opinion of the Ministry of Science, Industry and Technology.

It is crucial to state that preliminary permission is not a one-time only requirement. Application for extension of work permits are subject to preliminary permission of relevant ministry or Council of Higher Education too (Law no. 6735, et.7/ V).

4.2.3. Procedure and Evaluation of the Application

Foreigners are obliged to get a work permit before starting to work in Turkey (Çelikel/ Öztekin Gelgel, 2017: 188). Art.7 of Law no. 6735 regulates the procedure of work permit applications. The application can be made by the foreigner in person or by the authorized intermediary institution (Law no. 6735, art.7/ II).

Applications are made to the Ministry of Family, Labour and Social Services (Referred to as "Ministry" hereafter), when foreigner applies from Turkey. Applications from outside Turkey could be made to Turkish Embassies or Consulate Generals in countries where the applicant is a citizen of or legally resides. Such applications are transmitted to the Ministry by the embassies or consulate generals (Law no. 6735, art.7/ I).

Persons who are employed in foreign countries' diplomatic or consular missions in Turkey and subject to work permit applies to the Ministry of Foreign Affairs (Law no. 6735, art.14). In a similar manner, foreigners who work within the scope of Free Trade Areas Law no. 3218 (O. J. 15.06.1985, 18785) apply to the Ministry of Economy for work permit; those whose applications are approved by the Ministry of Economy are forwarded to the Ministry.

The Ministry assesses applications for work permit pursuant to international labour force policy. Law no. 6735 has also introduced a point scoring system based on the criteria in line with the Advisory Council of International Labour Force Policy. By this means, objective basis for the work permit application can be provided (Law no. 6735, art.7/ IV, VI).

In case of lack of information or documents, the evaluation of the application is postponed until these deficiencies are completed. The period of postponement takes maximum of 30 days in principle. At the end of the postponement period, applications whose deficiencies are not completed are rejected (Law no. 6735, art.7/ VII). The application is evaluated within 30 days (Law no. 6735, art.8).

The grounds for the refusal of the work permit application are listed in art. 9 of the Law no. 6735. According to this, applications made with false or misleading information and documents, applications for the jobs and professions allotted only to Turkish citizens, applications that are not submitted within the legal period or whose shortcomings are not completed will be rejected. Apart from this, applications which are not in compliance with the international labour force policy, applications of the foreigners who do not possess the necessary qualification or expertise, applications of foreigners who cannot meet the evaluation criteria determined by the Ministry, applications of foreigners who deemed prejudicial regarding public order, public health etc. are rejected. The grounds for the rejection listed in the second group are separated from the ones mentioned in the first group in terms of the discretionary power of the administration.

4.3. Exemption of Work Permit

Foreigners exempted from work permit can work in Turkey provided they obtain exemption of work permit. However, which foreigners are exempted from work permit has not been clarified in art.13 of the Law 6735. In art.13, only member of Board of Directors in a joint stock company who does not reside in Turkey and partners of other companies who are not director and cross border service providers whose operations do not exceed more than 90 days in a period of 180 days are exempted from work permit. Foreigners exempted from work permit and the sectors are to be regulated in by law (Law no. 6735, art.25/ I/ b). Nevertheless, said by law has not been issued yet. On that matter, Regulation on the Implementation of Foreigners' Work Permits (O. J. 29.08.2003, 25214) based on abolished Law numbered 4817 has to be applied. Because, the provisional article 1 of Law no. 6735 clearly stipulates that the current regulations shall be in force until the by laws regarding the implementation of Law no. 6735 are issued, unless they are inconsistent to Law no. 6735.

Application for exemption of work permit can be made by an authorized intermediary institution such as work permit applications (Law no. 6735, art. 13/ III). Applications within the country are made directly to the Ministry. Applications from abroad are made to Turkish Embassies or Consulate Generals in countries where the applicant is a citizen of or legally resides. These applications are transmitted to the Ministry by the embassies or consulate generals (Law no. 6735, art.13/ II).

Application for exemption of work permits are assessed according to international labour force policy as well.

4.4. Foreigners Subject to Special Conditions

Some foreigners are subject to different principals in terms of work permits and exemption of work permit due to their purpose of entry to country, field of work. These persons will be discussed below.

As stated above, refugees and persons who are under subsidiary protection within the scope of Law no. 6458 can work in Turkey without work permit or exemption of work permit. For that, they must obtain refugee or secondary protection status (Law no. 6458, art.89/ IV/ b). Nonetheless, foreigners who are applicant of international protection; conditional refuge; provided provisional international protection may work when they obtain work permit or exemption of work (Law no. 6735, art.17/ I). On the other hand, applications of said persons are specifically regulated in article 17 of Law no. 6735.

Foreigners whose applications for international protection have not been finalized yet, conditional refugees, foreigners provided provisional international protection cannot apply for work permit/ exemption of work before six months after the date of the application of the first international protection application or the date on which the temporary protection identification is issued (Law no. 6735, art.17/ I). Also, applications of these foreigners require positive opinion of the Ministry of Interior (Law no. 6735, art. 17/ II).

Similarly, foreigners who are studying for bachelor, master or doctoral degree in Turkey can work in Turkey by obtaining work permit (Law no. 6458, art.41/ I). However, the work permits of foreign students have been regulated in a different way in the Law No. 6735.

Art.19 of Law allows foreigners who seek 2-year or bachelor's degree to apply for work permit after completing of first year of their education. Such students can only work with part-time employment contract pursuant to the Labour Code numbered 4857.

It is pointed in the motive of the art.19, the provision aims to ensure that students continue their education and to define the students who continue their education and are successful as eligible for work permit.

It is crucial to note that the limitations regarding the application of work permit and the type of employment contract are not applicable to the graduate students enrolled in formal education programmes (Law No. 6735, art. 19/ II).

Foreign architect and engineer's application are also regulated with special provisions. Law on The Union of Chambers of Turkish Engineers and Architects numbered 6235 (O. J. 04.02.1954, 8625) imposes a general obligation of enrolment in order the architects and engineers to practice. In addition to that, relevant provisions of the Law numbered 6235 requires the opinion of the union of the chambers for issuing work permit to foreign architects and engineers. Law no 6735 has provided a facilitated procedure for the architects and engineers who received their title by completing their education in faculties of architecture or engineering in one of the Turkish higher education institutions or in a higher education institution in abroad which is recognized by the Council of Higher Education. Such persons can only practice engineering and architectural professions by obtaining project-based and temporary work permits.

5. PROFESSIONS AND OCCUPATIONS PROHIBITED TO FOREIGNERS

Certain professions and occupations are allotted to Turkish citizens; therefore, foreigners cannot practice these professions even with a work permit. Such professions and occupations are as follows:

- Dentistry and nursing (Law no. 1219, art.30, 63)
- Pharmacy (Law no. 6197, art.2)
- Veterinary (Law no. 6343, art.2)
- Director in charge in private hospital (Law no. 2219, art.9)
- Attorneyship (Law no. 1136, art.3)

- Notaryship (Law no. 1512, art.7)
- Private security (Law no. 5188, art. 10)
- Customs consultancy (Law no. 4458, art.227, 228)
- Tour guiding (Law no. 6326, art.3)

It should be noted that the abovementioned prohibition is not applicable to foreigners having Turkish descent. Pursuant to article 3 of the Law numbered 2527 (O. J. 29.09.1981, 17473), foreigners having Turkish descent can be employed or work independently for the jobs allotted to Turkish citizens as long as they obtain work permit (although, those foreigners cannot be employed in Turkish Armed Forces).

6. LEGAL CONSEQUENCES OF FOREIGN EMPLOYMENT CONTRARY TO THE LAW NUMBERED 6735

The audits to be carried out to ensure the implementation of the Law are carried out by the labour inspectors of the Ministry and the social security inspectors (Law no. 6735, art. 23/ I).

In addition, the audit personnel of the public administrations and the law enforcement officers are obliged to inform the Ministry in case of violation of the obligation stated in the Law no. 6735 (Law no. 6735, art. 23/ II).

Foreigners working without work permit and employers and their representatives who employ foreigners without work permit are charged with administrative fine pursuant to article 23 of Law no. 6735. In addition, foreigners detected to be working without work permit are reported to the Ministry of Interior to be deported.

Employers or representatives of employer must pay for the accommodation expenses and other expenses necessary for foreigners to return their country and health expenses if necessary. In case these expenses are covered from the General Directorate of Migration Management' budget, the Directorate recourse to employers or representatives of employer (Law no. 6735, art.23/ IX).

The effect of violation of the Law no. 6735 on the employment contracts between the foreigner and his/ her employer is not regulated in Law no. 6735. This problem needs to be examined in two phases. Employment contracts made for the jobs allotted only to Turkish citizens are deemed null and void; therefore, they are invalid since the beginning (Ergin, 2007: 1372-1373; Cengiz, 2008: 207; Süzek, 2016: 338).

The fate of the employment contracts concluded without work permit or exemption of work permit is controversial. Some of the scholars argue that the contract should be invalid in this case too (Süzek, 2016: 338- 340; Doğan Yenisey, 2014: 293) however, invalidity of the contract should not have a retroactive effect (Mollamahmutoğlu/ Astarlı/ Baysal, 2014: 502). As opposed to that, some scholars argue that failing to obtain work permit does not affect the validity of the employment contract (Cengiz, 2008: 208; Ergin, 2007: 1387-1388) but provides grounds for termination of it (Akyiğit, 1990: 26).

7. CONCLUSION

Law numbered 6735 abolished the Law numbered 4817 on the Work Permits of Foreigners. Although Law numbered 4817 has been into force for just 15 years, Turkish lawmaker has enacted new legislation regarding the work permits of foreigners. Law no. 6735 aims to compete in international labour market by bringing high skilled professionals into country. For that purpose, Turkish legislators have accepted new concepts. With the implementation of turquoise card, applications of certain foreigners who could be considered "qualified" are facilitated. On the other hand, certain field of expertise, such as education and health, have been subjected to preliminary permission.

There is also a significant change concerning the exemption of work permits. From now on, foreigners exempted of work permit must make an application in order to obtain exemption. Otherwise, both the foreigner and his/ her employer would be liable for the violation of Law no. 6735.

Violation of provisions regulated in Law no. 6735 has serious consequences. First, there is administrative fine that would be imposed on the foreigner himself and his employer or the representative of the employer. In addition to that, foreigners are faced deportation in case of employment without work permit.

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SELFLESS OR SKEPTICAL CONSUMER?

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ABSTRACT

Purpose- The aim of this paper is to examine the impact of environmental values on green purchase behaviour through environmental attitude and green skepticism.

Methodology- The data have been collected through a survey on a sample consisting of 306 consumers. To analyse the data, Structural equation modelling (SEM) using AMOS 20.0 was applied.

Findings- The research results revealed that the environmental values namely; altruistic and biospheric values affect green purchase behaviour. However, there is no effect of environmental values on environmental attitude and green skepticism. The results also showed that there is no significant effect of green skepticism and environmental attitude on green purchase behaviour.

Conclusion- Based on the findings, environmental values have effects on green purchase behaviours but green skepticism has no effect on green purchase behaviour. Yet, because of limited participations, the results cannot be generalizable.

Keywords: Environmental attitude, biospheric and altruistic values, green skepticism, green purchase behaviour.

JEL Codes: M30, M31

1. INTRODUCTION

The environmental challenges we face today, including rising sea levels, increasing global temperature, deforestation, and the declining availability of natural resources, are the result of human consumption. It is therefore widely accepted that environmental problems are sprig up by some kinds of human behaviours. Thus, these environmental problems could be reduced by means of changing such behaviours (Groot et al. 2012; Nicker son 2003; Gardner and Stern 2002), as environmental behaviour includes those behaviours which lead to change the structure of ecosystems (Groot et al. 2012; Stern 2000). There are many different kinds of environmental behaviours that are not only harmful like using car, but also pro-environmental like recycling for the environment. Hence, factors which affect environmental behaviours are important to improve environmental behaviours by means of pro-environmental behaviour (Groot et al. 2012).

The effects of values on behaviours at this point should not be overlooked. This is because values are often regarded when doing a research about environmental behaviour (Groot et al. 2012; Naess 1989; Dunlap, Grieneeks and Rokeach 1983). It was highlighted that "values, such as respect, equality, and unity with nature, are desirable trans-situational goals that vary in importance and serve as guiding principles in the life of a person or other social entity" (Schwartz 1992). In addition, some research explained that "the common attribute is the environmental values of the consumer" (Gilg, Barr, & Ford, 2005; Garcia and Manon 2016). The decision of consumers to care about environmental issues is affected by environmental values namely altruistic values (Garcia and Manon 2016). Thus, marketing research has focused on green marketing in the recent past. As a result of these green initiatives, there has been many developments of green products in many different industries such as food, energy, automobiles and so on (Goh and Balaji, 2016). Since, "green product" or services are called

organic, eco-friendly or ecological and all green products are produced through eco-friendly process (Lee, 2011; Garcia and Manon 2016).

In spite rising in academic work on green marketing, consumers concern about misleading environmental information that are disseminated by firms in order to improve their sales and reputation (Goh and Balaji, 2016). A research revealed that 48 per cent of consumer do not trust the claims about the environmental issues (Eurobarometer, 2009), and consumers do not believe about environmental claims which made by the firms and this phenomenon is called "green skepticism" is led by skepticism.

Despite rising consumer skepticism towards green products, studies on this issue are insufficient and limited. Beyond that, it is necessary to understand the effects of consumer values on green purchase behaviours in order to understand consumer skepticism. Thus, this article aims to examine which environmental values are associated with environmental attitude, green skepticism and green purchase behaviour. This article will also try to examine the effects of environmental values and green skepticism on green purchase behaviour. In line with the scope of work, first we will discuss how values are associated with environmental behaviours. Then, we will discuss how green skepticism affects consumer behaviours in marketing context. After that, we will examine and discuss the results based on the proposed model.

2. LITERATURE REVIEW

2.1. Environmental Values

Researchers have revealed that environmental beliefs and behaviour are affected by three different value orientations, namely, "an egoistic (i.e., values focusing on maximizing individual outcomes), a social-altruistic (i.e., values reflecting concern for the welfare of others), and a biospheric value orientation (i.e., values emphasizing the environment and the biosphere)" (Groot and Steg, 2007; Stern, 2000; Stern & Dietz, 1994; Stern, Dietz, & Kalof, 1993; Stern et al., 1998). Thus, within the scope of the research these three environmental values will be discussed in this section. Beyond that, environmental attitude and green skepticism will also be discussed based on the proposed model of the research.

2.2. Egoistic, Altruistic, Biospheric Values

Based on the previous researches, egoistic, altruistic and biospheric values are related to pro-environmental behaviour. However, researches also explained that people act based on their egoistic values rather than their altruistic or biospheric values. Thus, it need to be explained the question; why people do not act based on their altruistic and biospheric values (Groot, and Steg, 2008). In related studies, on the one hand, it has been explained that "egoistic concern is negatively correlated with self-transcendence (transcending an individual's selfish concerns and contributing to the well-being of others) and positively correlated with self-enhancement (enhancing an individual's own personal interest)" (Swami V et al., 2010; Schultz et al., 2005; Schultz, 2001). Moreover, self-transcendence (ST) and self-enhancement (SE) are in conflict and the location of self-transcendence (ST) and self-enhancement (SE) are opposite poles in a circumplex value structure (Hansla, 2011; Schwartz,1992) Moreover, self-enhancement (SE) is negatively related to the environmental concerns but, self-transcendence (ST) is positively related to environmental concerns (Hansla, 2011; Schwartz,1992) On the other hand, biospheric concern showed opposite pattern of correlations however, altruistic concerns demonstrated mixed correlations (positive and negative) in terms of both; self-transcendence and self-enhancement (Swami V et al., 2010; Hansla, Gamble, Juliusson & Garvill, 2008; Nordlund & Garvill, 2002, 2003; Schultz & Zelezny, 1999).

It is thus, the egoistic values were not considered in this research and two dimensions of environmental values namely; altruistic and biospheric values will be examined in order to reply the question that why consumers act based on altruistic and biospheric values? Moreover, most of these researches done is relevant to the environment, but consumption has not been considered in these studies adequately and it has not been examined whether environmental concerns and environmental values are influential when people consume. It is thus, in this research, not only the impact of environmental values on the attitude of people towards the environment and green skepticism but also the relationship between environmental values and the consumption of environmentally sensitive products will be examined. This is because today's people are faced with the following problems. One of them is the destruction of the environment as a result of over-consumption of environmentally harmful products and as mentioned the other is that the consumers think that the main purpose of the social responsibility projects of the companies is to sell more and that they are not related to the environment and they are skeptical (Goh and Balaji, 2016). Therefore, the following hypotheses were developed in the direction of the aim of this research;

H1a: Altruistic value is positively associated with environmental attitude.

H1b: Altruistic value is positively associated with green purchase behaviours.

H1c: Altruistic value is negatively associated with green skepticism behaviours.

H2a: Biospheric value is positively associated with environmental attitude.

H2b: Biospheric value is positively associated with green purchase behaviours.

H2c: Biospheric value is negatively associated with green skepticism behaviours.

2.3. Environmental Attitude

Attitude is explained and considered one of the most important factors that impacts on behaviour. Environmental attitude, in this sense, might be taken into considered positive or negative feeling toward environmental objects or issues (Chan 1996). Moreover, according to Kim (2011) environmental attitudes lead to a large variety of environmental behaviours. In spite of some weak relationships between environmental attitudes and environmental action, many researches supported that there is a link between (Kim, 2011; Lee and Holden 1999; Vining and Ebreo 1990; Hines, Hungerford, and Tomera 1987; Karp 1996; Milbrath 1984). Other researches, on the other hand, failed to support the link between environmental attitudes and environmental behaviours (Kim, 2011; Oskamp et al. 1991; Gill, Crosby, and Taylor 1986; Weigel 1985). It is might be claimed that environmental attitude is important but not sufficient for environmental action to take place (Kim, 2011). Because of these reasons, the environmental attitude should be examined in order to understand how environmental values affects environmental attitude and to determine whether there is a relationships between environmental attitudes and green purchase behaviours. Therefore, it is hypothesised that;

H3a: Environmental attitude is positively associated with green purchase behaviours.

2.4. Green Skepticism

"Skepticism is the overall tendency or inclination of an individual to distrust or doubt others" (Goh and Balaji, 2016; Obermiller and Spangenberg, 1998). It was also claimed that skepticism, which is not a kind of mood, appears under some certain circumstances (Albayrak et al., 2013). Skepticism has been examined in many disciplines like psychology, sociology and politics by previous researches (Goh and Balaji, 2016; Taber and Lodge, 2006; Rosen, 2004). Skepticism was also studied in business management in many different context like advertising, corporate social responsibility, organic products, cause-related marketing and environmental claims (Goh and Balaji, 2016; Vlachos et al., 2016; Skarmas et al., 2014; Kim and Lee, 2009).

Green skepticism is defined as a situation that the tendency in order to be doubtful about the environmental claims or performance for a green products. It is thus skepticism is not considered as a stable costumers' disbelief towards green products (Goh and Balaji, 2016). However, it is claimed that if customer who are skeptical about the claims of a company, then the advertisements' effects decrease. (Albayrak et al., 2013). Thus, it can be claimed that customers who are skeptical cannot believe the claims about the environmental issues such as global warming, rising sea levels, disappearance some of plant and animal species. For that reasons, it is important to examine the green skepticism in order to protect the not only the environment but also human life now and future. Even though there has been an increasing in research about skepticism in recent past (Goh and Balaji, 2016; Nyilasy et al., 2014; Matthes and Wonneberger, 2014; Raska and Shaw, 2012), it is not enough to understand the role of skepticism in green purchase behaviours (Goh and Balaji, 2016). Previous researches note that "Skepticism is a cognitive reaction that varies in accordance with the occasion and content of the communication" (Albayrak et al., 2013; Mohr et al., 1998). Thus, it is important point to examine the relationship between value and skepticism. This is because environmental values affect customers' environmental attitude as mentioned. Thus, it is proposed that;

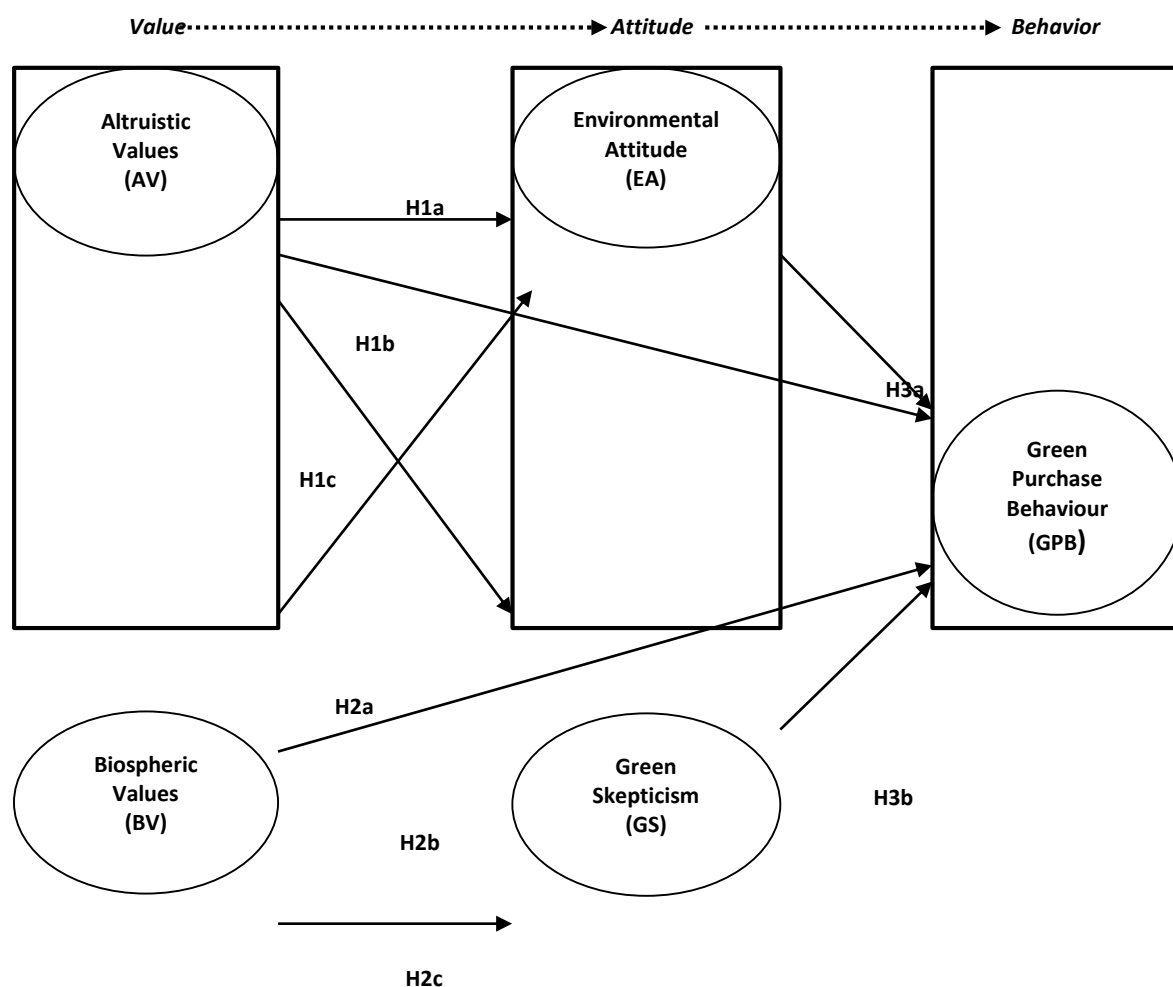
H3b: Green skepticism is negatively associated with green purchase behaviours.

3. DATA AND METHODOLOGY

3.1. Sample and Data Collection

The data were collected in the city of Bursa. The city was chosen because it is one of the biggest city in Turkey. It is thus people who live in Bursa have more opportunities in terms of education, job, than others but, they are witnessing some harmful applications at the same time because there are many factories doing business in Bursa. Simple random sampling (SRS) is a basic sampling method that every possible sample of size n (from a population of size N) has the same possibility to be chosen (Meng, 2013). Therefore, Simple Random Sampling (SRS) has been used in order to collect the data. In total, 306 respondents have participated in this survey. However, 3 of the questionnaires were eliminated because of most of data were missing and the remaining 303 were analysed. Of the respondents, 62.1 % were female and 37.9% male. The age range of participants between 18 and 50+ years old and the average income range of participants between less than 3000 Turkish Liras to more than 9000 Turkish Liras for per month. While 69.2% of respondents were holding a university degree, 2.6% were holding primary degree. So, a majority of the respondents were well-educated.

Figure 1: The Proposed Model



3.2. Analyses

Environmental values scale was adopted from Groot et al. (2012), which uses to examine three dimensions namely; egoistic, altruistic and biospheric of environmental values. However, in this research 8 item-scale of environmental values were used in order to examine the altruistic and biospheric values except egoistic value. The green purchase scale is adopted from Kim (2011) and used 4 items. To measure environmental attitude, 14 items of Dunlap et al., (2000) were used. However, 2 items were deleted because of the low values of communalities and poor loadings. 5 items of Mohr et al. (1998) were also used to measure green skepticism. In total, 31 items were used in this research. The Likert-scale was used in

order to measure all items. However, for environmental values (altruistic and biospheric) format ranged from “1=Not Important” to “5=Very Important” and for environmental attitude, green skepticism and green purchase behaviour format ranged “1=Strongly Disagree” to “5=Strongly Agree”.

4. FINDINGS AND DISCUSSIONS

In order to analyse the data for the objectives of this research, AMOS 20.0 pocket program was used. Confirmatory factor analysis (CFA) was performed firstly to examine the model fit. Moreover, to test the hypotheses of research, Structural equation model (SEM) performed. The result of CFA explained that χ^2 (df = 363) = 1.957, $P < 0.001$, Goodness of fit statistic (GFI) = 0.864, Adjusted goodness of fit (AGFI) = .837, The Normed fit index (NFI) = .833, Comparative-fit-index (CFI) = 909 and Root mean square error of approximation (RMSEA) = 0.056. According to Vinijcharoensri (2016) “The scores of baseline comparison fit indices ranged from between 0.812 and 0.905, which are close to and exceed 0.9 (recommended point).” Hence, it is implied that all measurement items are reliability and validity. After that the proposed model for the research was tested as shown below.

Figure 2: Assessment of Structural Model

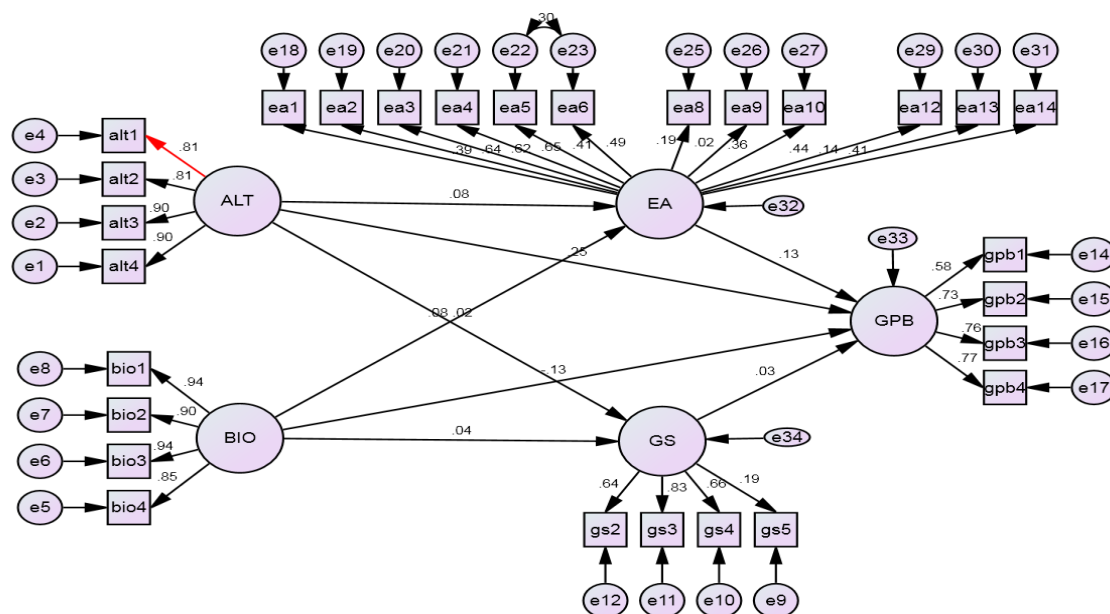


Table 3: Summary of Hypotheses Test Results

Hypothesis No.	Structural Path	Standardized Regression Weight (β)	Critical Ratio (C.R.)	Result
H1a	Altruistic value → Environmental attitude	.080	1.153	Not Supported
H1b	Altruistic value → Green skepticism	.024	.349	Not Supported
H1c	Altruistic value → Green purchase behaviour	.252**	3.721**	Supported
H2a	Biospheric value → Environmental attitude	.084	1.238	Not Supported
H2b	Biospheric value → Green skepticism	.040	.589	Not Supported
H2c	Biospheric value → Green purchase behaviour	-.132**	-2.061*	Supported
H3a	Environmental attitude → Green purchase behaviour	.126	1.699	Not Supported
H3b	Green skepticism → Green purchase behaviour	.032	.457	Not Supported

** $p < 0.001$, * $p < 0.05$, Supported=Significant and Not Supported = Not Significant.

5. CONCLUSION

Even though previous researches revealed that the influence of environmental values on green purchase behaviour was not significant (Tan et al., 2015), the results of this research explained that there is a significant relationships between environmental values and green purchase behaviour. In that point, this result explained that strong environmental values can influence consumer behaviour in terms of green purchase behaviour. The results also explained that there is no significant effect of environmental values on not only environmental attitude but also green skepticism. Moreover, the environmental attitude was positively and significantly associated with green purchase behaviours according to previous research (Tan et al., 2015). However, the results of this research showed that there is no significant effects between environmental attitude and green purchase behaviour.

The present study found out that there is no direct effects of green skepticism on green purchase intentions (Goh and Balaji, 2016; Matthes and Wonneberger, 2014) on the one hand. Morel and Pruyn (2003) point out that there is a direct effects of green skepticism on green purchase intentions on the other hand. However, previous researches have not examined the effects of green skepticism on green purchase behaviour. Thus, in this research, the effects of green skepticism on green purchase behaviour have been discussed rather than green purchase intentions. The result pointed out that there is no significant effects of green skepticism on green purchase behaviour. It is also showed that there is no relationships between environmental values and green skepticism. As a result of these findings it can be claimed that environmental values are important for consumers and consumers' behaviour can be affected by environmental values rather than green skepticism. It hence can be claimed that consumers can be more selfless than skeptics because environmental issues are crucial and they concern about the environment. Thus, environmental values have effects on consumer green purchase behaviour rather than green skepticism and consumers behave based on their environmental values.

Yet, research findings should be interpreted based on the limitations. Since, because of limited participation and limited time, the results cannot be generalizable. For the future research, consumers in developed countries have more educated and wealthier than consumers in developing countries. Thus, future research can build a research to explore how green skepticism and environmental values affect consumer decision making in terms of developed and developing countries. Quantitative method was used for this research and the data was obtained via questionnaire, future research can use qualitative method and face-to-face interview can be used to obtain data in order to understand what kinds of skepticism affect consumer decision making.

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DOES SENTIMENT AFFECT CAPITAL STRUCTURE DECISIONS?

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ABSTRACT

Purpose- This study aims to investigate whether investor and managerial sentiment have an effect on capital structure decisions of manufacturing firms listed on Borsa Istanbul between 2010 and 2017. This study contributes to the existing literature by including sentiment as a determinant of capital structure in the analysis as well as differentiating between investor and managerial sentiment.

Methodology- To test for the relationship, Consumer Confidence Index and Real Sector Confidence Index are used to proxy for investor sentiment and managerial sentiment, respectively. Quarterly financial statements of manufacturing firms are used to collect firm specific and capital structure data for the period from 2010 to 2017. Panel data framework is employed to analyze the relationship between firm specific variables and sentiment, and leverage level of the firms.

Findings- Statistically significant negative relationship is determined between investor sentiment and total leverage; and managerial sentiment and total leverage of the firms at 1% level. Hence, when sentiment goes up, representing optimism, debt level of firms goes down.

Conclusion- Our findings may be explained by the Market Timing Theory which argues that equity financing is preferred by managers when the stocks of the firm are overvalued on the market. Hence, when the market has an optimistic view, measured by investor sentiment, the firms have higher levels of equity financing which lends support to this argument. The findings also support the claim that individual perceptions are influential in the decision-making process. Managers as individuals, also prefer equity financing when they are optimistic, proxied by managerial sentiment.

Keywords: Capital structure, investor sentiment, managerial sentiment, market timing, behavioral finance.

JEL Codes: G32, G40, C23

1. INTRODUCTION

The capital structure decision still remains a puzzle for the finance researchers. Since Modigliani and Miller (1958) put forward the Irrelevance Theory of Capital Structure, many other theories, such as the Trade-off Theory, Pecking Order Theory and Market Timing Theory are developed and tested in various markets. Even though, the evidence provided by the capital structure research has been inconclusive (HaKilicris and Raviv, 1991, Myers, 2003), pecking order theory seems to dominate as stated by Kumar and Colombage (2017).

On the other hand, the Market Timing Theory questions the market efficiency assumptions of the Pecking Order Theory and the Trade-off Theory. It argues that managers seek for windows of opportunity and issue equity, given their financing needs, when they believe that the firm's stock is mispriced, specifically overvalued. If the market undervalues the stock, the managers prefer

debt financing. Baker and Wurgler (2002), Alti (2004), Hovakimian (2004), and Kayhan and Titman (2007) provide supporting evidence for Market Timing Theory.

In search of explanations for the capital structure choice of companies, there is extensive research focusing on the factors, firm-specific or country-specific that determine capital structure. Jong, Kabir, and Nguyen (2008), in their multi-country analysis, conclude that firm-specific factors of capital structure vary between different countries and country specific factors also play an important role through their influence on firm specific factors. Consequently, the finance literature mainly investigates the effect of firm size, profitability, tangibility of the firm's asset, growth opportunities of the firm, taxes and non-debt tax shield as firm-specific factors, and gross domestic product, inflation and financial market development level as country specific factors on capital structure choice.

In addition to the firm specific and country specific factors, approaching the arguments of Market Timing Theory from a behavioral perspective, it can be argued that capital structure decisions should also be affected by the managers' and investors' confidence in the market. Hence sentiment, defined as pessimism or optimism of investors (Baker and Wurgler, 2006:1649), can be used as a measure of confidence. That is if optimism exists in the market, the stock prices will go up leading to overvaluation of equities, which may in return lead managers to choose equity financing. Hence the managers will be acting according to the market timing theory or windows of opportunity hypothesis (Ritter, 1991; Loughran and Ritter, 1995).

In line with the above explanations this study aims to contribute to the literature by investigating whether investor and managerial sentiment have an impact on capital structure decisions of manufacturing firms listed on Borsa Istanbul between 2010 and 2017. Moreover, different than previous studies, sentiment is analyzed from the investors' and managers' points of view distinctively. Investor sentiment proxied by the Consumer Confidence Index (*CCI*) to measure the optimism in the market in general and managerial sentiment by the Real Sector Confidence Index (*RSI*) to measure the optimism of the managers regarding the market are analyzed in order to shed light on their possible effects on capital structure choice.

The rest of the study is structured as follows: In the second part studies on capital structure, sentiment measures and their relationship are reviewed. Data and methodology are explained in the succeeding part, followed by the presentation and discussion of empirical findings. The last part concludes.

2. LITERATURE REVIEW

The research on capital structure has concentrated around two theories, namely the Trade-off theory and Pecking Order Theory. Trade-off theory states that there is an optimal capital structure where the benefits and costs of debt are balanced. Debt has tax benefits (Miller and Modigliani, 1963; Miller, 1977) as well limiting the agency costs of free cash flows (Jensen, 1986). However, debt financing also has bankruptcy costs. The Pecking Order Theory, on the other hand, argues that because of information asymmetries and the investors' reaction to stock issues, the managers prefer new equity issue as a last resort (Myers, 1984; Myers and Majluf, 1984). However, as Fama and French (2005) conclude both theories have drawbacks as well as plausible explanations for capital structure decisions. Market timing theory on the other hand argues that firms will prefer equity financing when their stock is overvalued. In other words, managers will take advantage of hot markets and issue new equity (Baker and Wurgler, 2002; Bayles and Chaplinsky, 1996).

Many studies aiming to test the above-mentioned theories have empirically examined firm-specific and country-specific factors that determine capital structure (Jong, Kabir, and Nguyen, 2008; Titman and Wessels, 1988). Firm size, profitability, tangibility of the firm's assets, growth opportunities, taxes and non-debt tax shield as firm-specific factors and gross domestic product, inflation and financial market development level as country specific factors are mainly investigated. Corporate governance related factors such as the board structure and ownership structure are included in the analysis.

To test for the Market Timing Theory of capital structure, effect of sentiment on capital structure should be investigated. Since sentiment is defined as pessimism or optimism of investors related with financial markets (Baker and Wurgler, 2006: 1649), it reflects hot markets when there is optimism. Shefrin (2008:216) asserts that sentiment is optimism regarding financial market conditions and similarly Statman et al (2008: 20) describe it as the thoughts and perceptions of investors regarding financial market conditions. Consequently, it can be argued that when investor sentiment is high, that is, there is optimism in the market, managers will prefer equity financing.

Moreover, it is documented by Bilgehan (2014), Mefteh and Oliver (2010), Oliver (2005) that the managers' biases also affect their choice of financing decisions. The manager's confidence in the market or himself must be distinguished. Majority of the studies focus on managerial overconfidence in their abilities and hence argue that there is a positive relationship between

managerial confidence and debt financing (Bilgehan, 2014). However, if the managers' perception of the market is taken into consideration, the relationship must be negative following the market timing theory. That is, if the managers are optimistic about the market conditions, that is if managerial sentiment is high, then they should prefer equity financing.

A variety of measures is used for sentiment in the literature. These include direct measures such as confidence or sentiment surveys, and indirect measures such as closed end fund discount, stock market transaction volume, first day returns of initial public offerings, fund flow of mutual funds and internet searches. Moreover, Baker and Wurgler (2006) suggest using a composite sentiment index which they argue reflects sentiment better than the indirect measures.

Since the aim of the present study is also to distinguish between the impacts of managerial and investor sentiment on capital structure choice, direct measurement will be preferred. As a proxy for investor sentiment, Consumer Confidence Index (*CCI*) and for managerial sentiment Real Sector Confidence Index (*RSI*) calculated by the Central Bank of the Republic of Turkey (CBRT) and Turkish Statistical Institute (TURKSTAT) are used. *CCI* is calculated based on survey data from consumers whereas *RSI* is calculated based on survey data from managers. Therefore, including these as proxies of investor sentiment and managerial sentiment in the analysis will make it possible to distinguish between the two types of sentiment.

3. DATA AND METHODOLOGY

3.1. Data

We obtain firm-level data from the FINNET database. Our sample consists of 169 non-financial firms listed on Borsa Istanbul after we drop the financials and the firms with interrupted data. We collect three leverage measures, total leverage, long-term leverage, and short-term leverage. We also obtain firm-specific data measuring size, profitability, tangibility of assets, taxes paid by the firms and growth opportunities of the firms.

Sentiment and macroeconomic indicators are obtained from the Central Bank of the Republic of Turkey (CBRT) and Turkish Statistical Institute (TURKSTAT). Consumer Confidence Index (*CCI*) and Real Sector Confidence Index (*RSI*) are used as proxies for investor sentiment and managerial sentiment, respectively. *CCI* is calculated according to participants' answers to the questions related with their current opinions and expectations about general economic conditions and their personal financial conditions. *RSI* is an indicator that aims to show the impressions of real sector representatives about the general situation of the Turkish economy. We include Consumer Price Index as a macroeconomic indicator in the analysis.

We analyze quarterly data over the period 2010Q1 – 2017Q4. Table 1 reports the definition of the variables used in the analysis along with summary statistics.

Table 1: Definition of Variables and Summary Statistics

Name	Acronym	Definition/Calculation	Mean	Std. Dev.
a. Leverage Measures				
Total Leverage	<i>TLV</i>	Total Debt ÷ Total Assets	0.525	0.476
Long Term Leverage	<i>LLV</i>	Long Term Debt ÷ Total Assets	0.150	0.170
Short Term Leverage	<i>SLV</i>	Short Term Debt ÷ Total Assets	0.375	0.426
b. Firm-Specific Factors				
Size	<i>SZE</i>	Natural Logarithm of Sales	18.915	2.150
Profitability	<i>PRF</i>	EBITDA ÷ Total Assets	0.059	0.070
Tangibility	<i>TNG</i>	Plant Property Equipment ÷ Total Assets	0.481	0.219
Tax	<i>TAX</i>	Tax Paid ÷ EBT	-0.358	32.396
Growth Opportunities	<i>MTB</i>	Market Value ÷ Book Value	2.401	5.136
c. Sentiment and Macroeconomic Indicators				
Investor Sentiment	<i>CCI</i>	Change in Consumer Confidence Index	0.002	0.047
Managerial Sentiment	<i>RSI</i>	Change in Real Sector Confidence Index	0.005	0.026
Consumer Price Index	<i>CPI</i>	Change in Consumer Price Index	0.021	0.013

3.2. Methodology

We estimate the following panel-data models using Generalized Least Squares (GLS) to examine the relationship between each of the leverage measures and the sentiment indicators:

$$y_{it} = \alpha + \beta_1 CCI_{it} + \beta_2 \mathbf{X}_{it} + \varepsilon_{it} \quad (1)$$

$$y_{it} = \alpha + \beta_1 RSI_{it} + \beta_2 \mathbf{X}_{it} + \varepsilon_{it} \quad (2)$$

where y_{it} is one of the leverage measures (i.e. TLV , LLV , SLV) and $\mathbf{X}_{it} = (SZE_{it}, PRF_{it}, TNG_{it}, MTB_{it}, TAX_{it}, CPI_{it})'$ is the vector of firm-specific and macroeconomic variables, CCI_{it} and RSI_{it} are the investor and managerial sentiment indicators, respectively, and ε is the error term. For each of the six panel-data models specified above, we calculate the Hausman test statistics for testing the null hypothesis of random effects against the alternative hypothesis of fixed effects.

4. FINDINGS AND DISCUSSIONS

Table 2 reports the estimation results for the panel data models specified in Equations (1) and (2). p -values of Hausman test statistics are estimated higher than the conventional statistical significance levels, suggesting using random effects specification for all specified models. For all estimated models, we reject the null hypothesis that all coefficients in the model are zero at the 1% level based on the p -values of χ^2 statistics, $p\text{-}\chi^2$, reported in Table 2.

Table 2 shows that CCI and RSI have significant negative impact on TLV at the 1% significance level. The parameter estimates of CCI and RSI are not statistically significant at conventional levels in the other models, suggesting that none of the sentiment indicators (CCI and RSI) has an impact on each of the other leverage measures, LLV and SLV . These results are consistent with the Market Timing Theory and imply that the higher the optimism about the market, lower the debt level.

Table 2: Random GLS regression Results

Independent Variable	Dependent Variable					
	TLV	LLV	SLV	TLV	LLV	SLV
α	-0.433 ^a (0.004)	-0.369 ^a (0.000)	-0.028 (0.801)	-0.442 ^b (0.003)	-0.372 ^a (0.000)	-0.335 (0.765)
CCI	-0.083 ^a (0.010)	-0.330 (0.275)	-0.051 (0.301)	-	-	-
RSI	-	-	-	-0.260 ^a (0.008)	-0.366 (0.674)	-0.222 (0.186)
SZE	0.0485 ^a (0.000)	0.022 ^a (0.000)	0.024 ^a (0.000)	0.0488 ^a (0.000)	0.224 ^a (0.000)	0.249 ^a (0.000)
PRF	-0.8242 ^a (0.001)	-0.227 ^a (0.000)	-0.584 ^a (0.002)	-0.821 ^a (0.001)	-0.226 ^a (0.000)	-0.582 ^a (0.002)
TNG	0.149 (0.169)	0.218 ^a (0.000)	-0.084 (0.333)	0.152 (0.162)	0.219 ^a (0.000)	-0.081 (0.354)
MTB	0.003 ^c (0.062)	0.000 (0.560)	0.003 ^c (0.064)	0.003 ^c (0.062)	0.000 (0.564)	0.003 ^c (0.064)
TAX	0.000 ^b (0.012)	0.000 (0.644)	0.000 ^a (0.010)	0.000 ^c (0.057)	0.000 (0.820)	0.000 ^c (0.055)
CPI	0.346 ^a (0.003)	0.254 ^a (0.000)	0.093 (0.349)	0.440 ^a (0.000)	0.269 ^a (0.000)	0.172 ^b (0.036)
Summary Statistics						
σ_u	0.431	0.123	0.345	0.431	0.123	0.345
σ_e	0.201	0.102	0.237	0.201	0.102	0.237
ρ	0.820	0.593	0.678	0.820	0.592	0.678
$p - (\chi^2)$	0.000	0.000	0.000	0.000	0.000	0.000
R^2 - within	0.055	0.051	0.019	0.056	0.051	0.020
R^2 - between	0.003	0.160	0.016	0.003	0.160	0.015
R^2 - overall	0.008	0.120	0.017	0.008	0.120	0.016
$p - BP$	0.000	0.000	0.000	0.000	0.000	0.000
$p - Hausman$	0.483	0.587	0.188	0.431	0.123	0.345

Note: *a, b, and c indicate statistical significance at 1%, 5% and 10% level, respectively. The numbers in parentheses are standard errors of the parameter estimates. ρ is the interclass correlation and is calculated by dividing σ_u^2 by sum of σ_u and σ_e . (where σ_u and σ_e are standard deviation of residuals within groups (u_i) and standard deviation of overall error term (e_i)). $p - (\chi^2)$ is the p-value of the test statistic for the null hypothesis that all coefficients in the model are zero. R^2 – within, R^2 – between, and R^2 – overall are the coefficients of determination for within the groups, between the groups, and overall, respectively. $p - BP$ is the p-value of the Breusch and Pagan (1980) Lagrange multiplier (LM) test for the null hypothesis that variances across groups are zero. It also shows that random effects model is appropriate. $p - Hausman$ is the p-value of Hausman (1978) test for the null hypothesis of random model is appropriate.*

The parameter estimates of *SZE (PRF)* in the models are found to be positive (negative) and statistically significant at the 1% level. The positive (negative) sign of the *SZE (PRF)* estimates suggests that firm size (profitability) has a positive (negative) impact on the leverage regardless of the maturity, consistent with the Trade-off Theory (Pecking Order Theory). *TNG* has only significant and positive impact on *LLV* at the 1% level, consistent with both the Trade-off Theory and Pecking Order Theory. *MTB* and *TAX* have positive and significant relationships with *TLV* and *SLV* at the conventional significance levels. While our findings related to *MTB* are consistent with the Pecking Order Theory, the results for *TAX* are in accordance with the Trade-off Theory. *CPI* is found to have a positive and significant impact on *TLV* and *LLV* at the 1% level, which is in line with the Trade-off Theory. The relationship between *CPI* and *SLV* is only significant in the model with *RSI* at the 5% level.

5. CONCLUSION

The search for the explanation of capital structure choice still continues. Researchers have developed theories that try to explain how the firms make their financing choices. The Trade-off Theory, Pecking Order Theory and Market Timing Theory are the three main theories that are researched most commonly. However, none of them can provide an answer by itself and they all have drawbacks.

The determinants of capital structure are investigated based on the arguments of the above-mentioned theories. Firm-specific and country-specific factors are tested in one country or multi-country contexts. The present study added sentiment as another determinant of capital structure based on the market timing theory. Since the market timing theory argues that the managers prefer equity financing during hot markets, sentiment may proxy for the perception of the investors and manager of the market conditions. Hence this study aimed to contribute to the literature by investigating whether investor and managerial sentiment have an impact on capital structure decisions of manufacturing firms listed on Borsa Istanbul between 2010 and 2017. Moreover, different than previous studies, sentiment is analyzed from the investors' and managers' points of view distinctively. Investor sentiment proxied by the *CCI* to measure the optimism in the market in general and managerial sentiment by the *RSI* to measure the optimism of the managers regarding the market are analyzed in order to shed light on their possible effects on capital structure.

The empirical findings show that *CCI* and *RSI* have statistically significant negative effect on total leverage of the firms. The results for total leverage are consistent with the Market Timing Theory implying that when the investors' as well as managers' sentiment goes up, the preferred financing is equity financing. Stated differently, when there is optimism in the market or when the managers are optimistic about market conditions, then to take advantage of this equity is preferred. However, the same relationship did not sustain for short-term or long-term leverage. Hence this needs further investigation. The present study also provided evidence on the relationship of other determinants with capital structure. The evidence was mixed supporting the Trade-off Theory for some and Pecking Order Theory for the others which provides support to the argument that these theories are complementary rather than supplementary.

In sum, the statistically significant relationship found for investor sentiment and managerial sentiment is consistent with Market Timing Theory. The findings also support the claim that individual perceptions are influential in the decision-making process. The study contributed to the literature by using two separate measures to distinguish between investor and managerial sentiment as well as including sentiment as a determinant in the analysis.

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DO FOREIGN DIRECT INVESTMENT IN IVORY COAST INCREASE CO₂ EMISSIONS?

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ABSTRACT

Purpose- In this paper, we study, on the basis of an endogenous growth model, the effect of foreign direct investment on CO₂ emissions in Ivory Coast from 1975 to 2014.

Methodology- The preferred econometric tool is the ARDL model.

Findings- The results show a positive relationship between CO₂ emissions and FDI whose associated coefficient is significantly different from zero in the short term. This result suggests that the contribution of FDI to CO₂ emissions is minimal. Indeed, if FDI increases by 1 point (100%) then CO₂ emissions increase by 0.03%. In the long term, the results suggest that the increase in FDI will lead to an increase in pollution with an associated coefficient significantly different from zero. As in the short term, this result also shows that the contribution of FDI to CO₂ emissions is minimal in the long term. A 1 point increase in FDI (100%) leads to an increase in CO₂ emissions of 0.14%.

Conclusion- The improvement of the business, investment and trade climate in Ivory Coast, must be supported by social measures intended, in particular, to protect the health and safety of workers. Because environmental degradation due to an increase in emissions of CO₂ supplies can have a negative impact on human health and bring about a decrease of economic growth.

Keywords: Foreign direct investment, CO₂ emissions, growth, ARDL, Ivory Coast.

JEL Codes: F20, O10, Q40

1. INTRODUCTION

According to UEMOA, foreign direct investment (FDI) is considered as "the purchase, creation or extension of businesses, branches or other personal enterprises". It is also "all other operations, where, isolated or multiple, concomitant or successive, they have the effect of allowing one or more persons to take or increase the control of a company engaged in an industrial, agricultural activity, commercial, financial or real estate, whatever its form, or to ensure the extension of such a company already under their control ". FDI therefore represents the installation of part of a firm's production abroad or the acquisition of a stake in a firm located abroad (Dago, 2010). The analysis of the relationship between FDI, growth and environment generates controversies about these virtuous effects on the one hand, and these vicious effects on the other hand.

First of all, as regards the virtues of FDI, four types of arguments concerning its relationship with growth and the environment theoretically justify them. The former is appreciated in terms of technology transfer and skills (Al-Mulali and Tang, 2013). The second is more traditional: it refers to the increase in job creation following the increase in direct investment (Strat, Davidescu and Paul, 2015) with a positive impact on growth (Nkechi, 2013). The third is the accumulation of human capital with the improvement in the quality of the labor force (Bahmaid, 2013; Ismaila, 2017). The fourth, finally, is the pollution hola hypothesis, which demonstrates that FDI provides advanced technology leading to the reduction of greenhouse gas emissions in host countries (Leiter, Parolini, and Winner, 2011; Zhang and Zhou, 2016), so countries have an interest in attracting FDI for their environmental quality through the absorption by local firms of a relatively cleaner technology transfer.

FDI can, however, be the source of vicious effects. Indeed, while it is accepted that FDI promotes economic growth, energy consumption can be proportional to growth. Thus, FDI can contribute to the degradation of the environment due to

greenhouse gas emissions: this is the hypothesis of the pollution haven hypothesis (Mercan and Karakaya, 2015; Kheder and Zugravu, 2012). Increased environmental pollution can cause at least three adverse effects. The first concerns the reduction of production and therefore of income (Borhan, Ahmed and Hitam, 2012). The second focuses on the degradation of social well-being (Hitam and Borhan, 2012). The third is the decline in capital and labor productivity (Zivin and Neidell, 2012).

On the other hand, it is possible to argue that competitive pressures due to FDI can lead to crowding out of domestic investment (Morrissey and Udomkerdmongkol, 2012; Mutenyo, Asmah and Kalio, 2010) and pushing the least efficient firms to exit of the market, which could increase unemployment in the long term (Mucuk and Demirsel, 2013; Saray 2011) and reduce growth (Kyle and Miguel, 2015).

The impact of FDI on growth and the environment has been researched using the endogenous growth model at Romer (1986). Within these models, FDI is presented as an endogenous variable acting on economic growth via human capital, that is, knowledge, know-how and the knowledge to be incorporated by each individual. The divergence in the results of this work reveals the ambiguity of the relationship between FDI and growth on the one hand and FDI and the environment on the other.

On the basis of an endogenous growth model at Romer (1986), this article aims to examine how FDI affects CO₂ emissions, which are key determinants of environmental degradation in Ivory Coast from 1975 to 2014.

The rest of the work is organized as follows: Review of the empirical literature (II); Descriptive analysis (III); Econometric approach and results (IV); Conclusion (V).

2. EMPIRICAL LITERATURE

While the theoretical results relating to the nature of the relationship between FDI, growth and the environment are nuanced, empirical evidence is even more so. It shows at least four cleavages. The first establishes a one-way relationship between energy consumption and growth. The second supports an increase in energy consumption due to economic growth. While the third shows a bidirectional relationship, the latter does not establish any causal relationship between energy consumption and economic growth. So what to think? Taking into account the hypotheses of the pollution haven and the Kuznets environmental curve makes it possible to better appreciate the relations between FDI, growth and the environment, and to explore both hypotheses. The answer is nuanced.

Firstly, in the case of the pollution haven hypothesis (HHP), it stipulates that the political and regulatory conditions favor the relocation of companies in order to benefit from environmental conditions that are less demanding than in their own territory contributes to the degradation of the environment.

The HHP has been tested by Al-Mulali and Tang (2013) who show that FDI does not contribute to environmental degradation in the case of the Gulf Cooperation Council countries between 1980- 2009. The authors note the existence of a non-linear relationship between FDI and CO₂ emissions, which reflects the non-validation of HHP. Similarly, Lee and Brahmasrene (2013), using a cointegration model based on panel data, find that FDI has a negative and significant effect on CO₂ emissions from 1988 to 2009 in the European Union. Leiter, Parolini, and Winner (2011) have already achieved such results by arguing that environmental regulations have been favorable for industrial investment in European countries between 1998-2007.

However, Blanco, Gonzalez and Ruiz (2013) argue for a unidirectional causal relationship between FDI and CO₂ emissions where increased FDI causes CO₂ emissions to increase in 18 Latin American countries. This result is confirmed by Zhang (2011) who notes an increase in CO₂ emissions due to FDI in China between 1980 and 2009. The same is true for Middle Eastern countries where FDI has favored increase of the greenhouse gas between 1990-2009 according to Al-Mulali (2012).

In addition, FDI can promote both an increase and a reduction of CO₂ emissions. Zeren (2015) tested this hypothesis and shows that HHP is validated for the United States, France and England and rejected in the case of Canada between 1970 and 2010.

On the other hand, it is possible that no statistically significant relationship is established between FDI and CO₂ emissions. This is indeed the case in Turkey, where Kizilkaya (2017), based on a delayed autoregressive model (ARDL), finds no significant relationship between foreign direct investment and CO₂ emissions during the period 1970-2014 because of the low contribution of FDI to GDP.

Regarding the Kuznets environmental curve hypothesis (EKC), Simon Kuznets argues that there is an inverted U-shaped relationship between per capita income and income equality. From this point of view, the EKC hypothesis states that the development process of all countries leads in the first place to the pollution of the environment. But at a certain level of per capita income, the process will be reversed with a reduction in environmental degradation. As income rises, individuals become more and more concerned about the quality of their environment and the improvement of their standard of living.

The validity of the EKC was implemented by Tang and Tan (2015) on the basis of a Granger causality model. The authors demonstrated the existence of a bidirectional causal relationship between CO₂ emissions and economic growth in Vietnam between 1976-2009. Kiviyro and Arminen (2014), on the other hand, highlight controversial results in the analysis of the relationships between CO₂ emissions, energy consumption, economic development and FDI in six sub-Saharan African countries for the period 1970- 2009. On the basis of an ARDL model, if the EKC is validated for the Democratic Republic of the Congo, Kenya and Zimbabwe, this is not the case for South Africa, the Republic of Congo and Zambia. Similar results were obtained by Pao and Tsai (2011) who, based on panel data, note the existence of a bidirectional causal relationship between CO₂ emissions and FDI on the one hand and causality unidirectional between GDP and FDI during the 1980-2000 period in the BRIC countries.

In addition, Arouri, Youssef, M'henni and Rault (2012), in the case of the 12 countries of the Middle East and North Africa highlight the validity of the EKC with low turning points in some cases and very high in others, between 1981 and 2005.

otherwise, some authors confirm both the validity of EKC and HHP in their analysis. Indeed, from an ARDL model, Thanh and Khuong (2017) show that economic growth, energy consumption, financial development, FDI and trade openness have a positive influence on CO₂ emissions in Vietnam between 1990-2011. Similarly, Hitam and Borhan (2012) note an increase in CO₂ due to the increase of the population in Vietnam. In other words, human activities through farming, forestry and mining contribute to the increase in GHG concentrations.

From one economy to another, the research shows a variety of results regarding the link between FDI, growth and the environment. These contradictory results stem from the type of explanatory variables, the choice of econometric model and the specificity of economies. What about Ivory Coast?

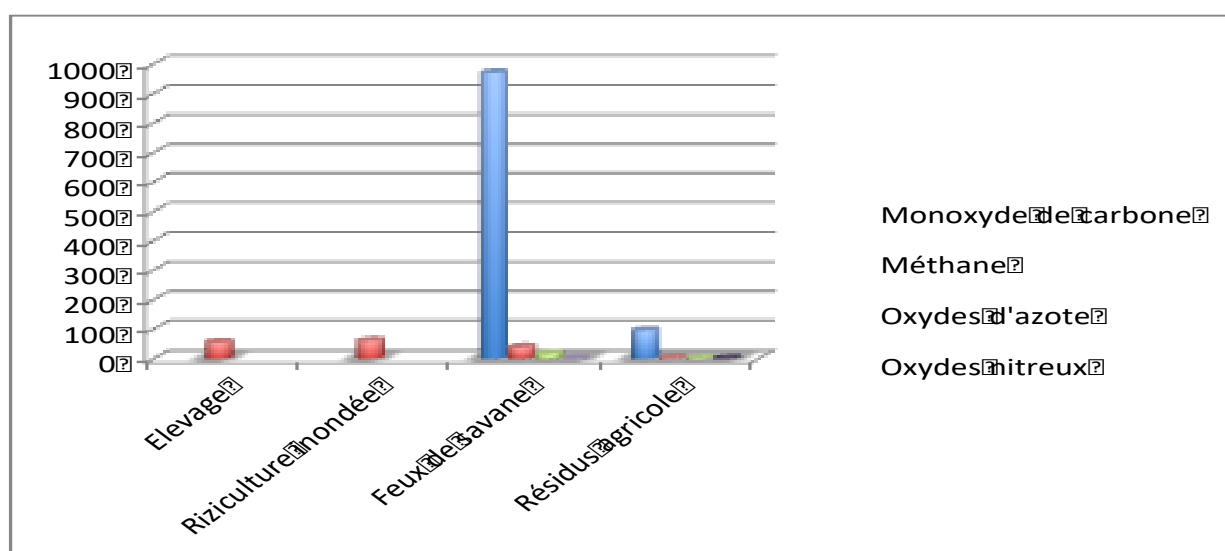
3. DESCRIPTIVE ANALYSIS

In Ivory Coast, most work on FDI is studying their impact on growth (Kyle and Miguel, 2015). Those relating to the effect of FDI on the environment are almost non-existent. This article is also intended to fill this gap. The interest in the relationship between FDI and the environment in Ivory Coast is justified mainly by two arguments. The first concerns the improvement of the business climate and the influx of FDI (Kyle and Miguel, 2015), which represent the key elements of the country's economic growth (AfDB, OECD and UNDP, 2016). And the second relates to pressures on natural resources (land, forests, water, etc.) (Tano, 2012) due to agricultural and industrial development.

3.1. An Economy Highly Dependent on the Exploitation of Natural Resources

According to the World Bank, agriculture accounts for about 30% of GDP. The abusive and uncontrolled exploitation of natural resources has precipitated the degradation of the forest (Brou, 2010). Mainly, slash-and-burn techniques were the main sources of greenhouse gas emissions. Similarly, methane, carbon monoxide, nitrous oxide and nitrous oxide, agricultural residues and pesticides aggravate soil depletion (Aschieri and Lelievre, 2012) (Chart 1).

Chart 1: Inventory of GHG Emissions Sources in Agriculture



Source: Authors of the article, using MEF data (2000)

In the industrial sector, improving the business climate in terms of business creation, contract enforcement and business regulation has provided incentives for the private sector, including FDI. Although their impact on growth is still mixed, the industrial sector composed of agri-food, chemical and biochemical industry, mining, textile and wood, contributes slightly to GHG emissions. The cement clinker is not produced locally, but is imported. This activity does not generate CO₂ emissions. Other industrial units can be considered as minor sources of emissions.

3.2. Descriptive Characteristics and Evolution of the Variables

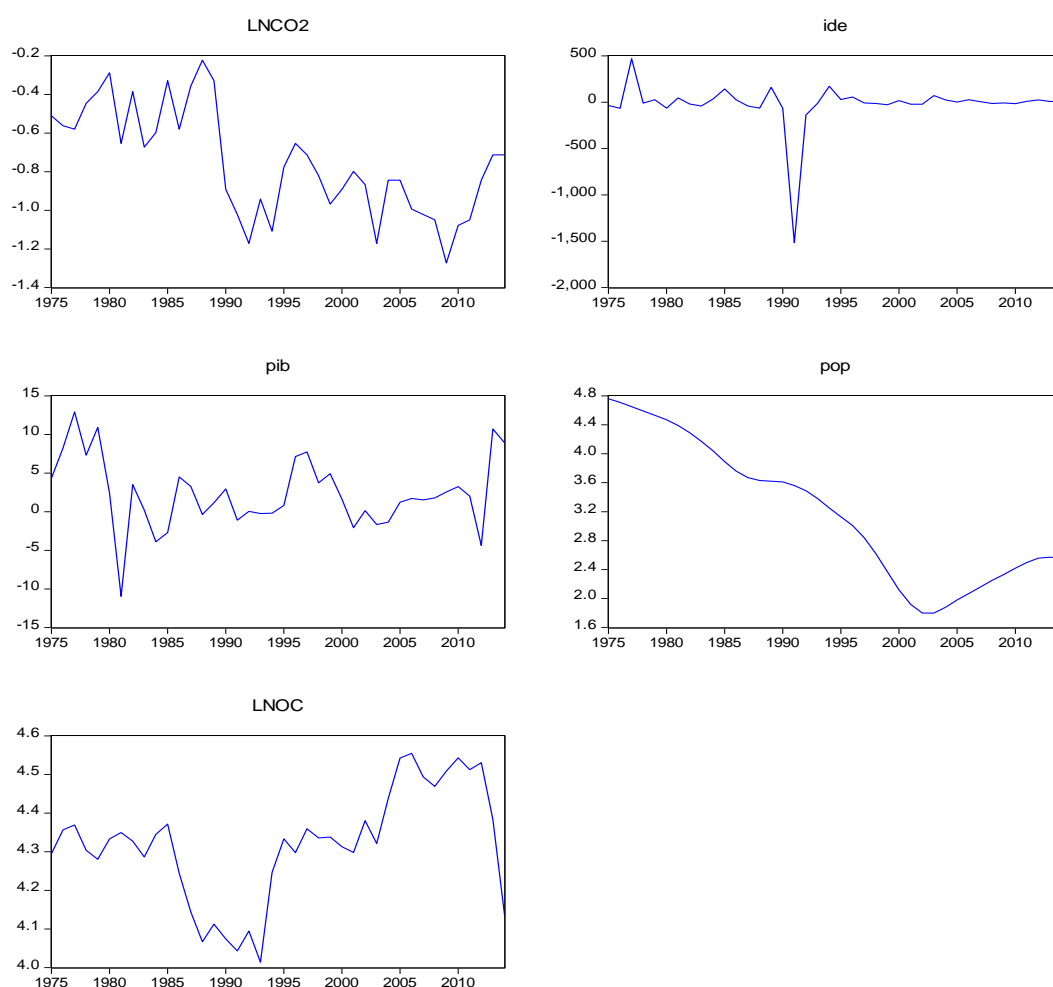
In terms of the Standard Deviation (Std Dev.) (Table 1), the analysis of the characteristics of the variables used shows that FDI and GDP are more volatile compared to other variables. This situation can be explained by the economic and politico-military crises that the country has been experiencing since the 1980s. To do this, Zivot and Andrews's stationarity test (1992) will be preferred to that of ADF for verification of the unit root of the GDP variable who is the victim of a change of regime. In addition, the variables are normally distributed (Jarque-Bera Prob> 5%), except the IDE variable.

Table 1: Descriptive Analysis of Variables

	LNCO₂	IDE	PIB	POP	LNOC
Mean	-0.753040	-21.58750	2.312500	3.183750	4.318520
Median	-0.787518	-4.000000	1.745000	3.190000	4.333230
Maximum	-0.223144	468.5600	12.92000	4.760000	4.554613
Minimum	-1.272966	-1515.650	-10.96000	1.800000	4.013677
Std. Dev.	0.276668	259.8469	4.586337	0.955990	0.145536
Skewness	0.163544	-4.734986	0.005923	0.150049	-0.349520
Kurtosis	2.079829	29.09677	3.842661	1.682789	2.523618
Jarque-Bera	1.589502	1284.537	1.183698	3.041840	1.192660
Probability	0.451694	0.000000	0.553303	0.218511	0.550829
Sum	-30.12161	-863.5000	92.50000	127.3500	172.7408
Sum Sq. Dev.	2.985262	2633296.	820.3450	35.64274	0.826054
Observations	40	40	40	40	40

Source: Author of the article from the results obtained on Eviews 9

Concerning the evolution of the variables, Chart 2 shows an overall stability of the latter between 1975 and 2014. However, the 1990s was particularly marked by a high degree of social and political instability, which led to a decline in wealth and FDI inflows.

Chart 2: Evolution of the Variables Studied

Source: Author of the article from the results obtained on Eviews 9

Regarding the impact of FDI on CO₂ emissions in Ivory Coast, in order to ignore the aberrant value that prevents us from clearly reading the relationship between variables, we re-evaluated FDI in 1977 and 1991 in replacing them by the average of the observations in 1976 and 1978 and in 1990 and 1992 respectively for the data of 1977 and 1991.

4. ECONOMETRIC APPROACH AND RESULTS

We build on the work of Kizilkaya (2017), who has studied the relationship between carbon dioxide emissions and foreign direct investment in Turkey. But, unlike Kizilkaya (2017) who showed, on the basis of an ARDL model, the impact on CO₂ emissions of growth and energy consumption, we are expanding the model and adapting it to case of Ivory Coast enriching it with an opening on the outside. We make the central assumption that in the long term, in Ivory Coast, the impact of FDI on CO₂ emissions is positive between 1975 and 2014.

The analysis of the relationship between FDI and the environment presents the difficulty of having statistical data over a long period for Ivory Coast. This difficulty has led to the use of the World Bank's World Development Indicators (WDI) as the main source of data. We therefore constructed time series over the period 1975-2014, for a total of 40 observations. The variables in our model are as follows: The variable explained is greenhouse gas emissions. Any increase in this variable is a sign of environmental degradation with a negative impact on social well-being. The explanatory variables include: FDI, economic growth, trade openness and total population. To explain the source of the relationship between FDI and the environment, we build an endogenous growth model at Romer (1986) in which we consider FDI as the engine of growth. Thus, by calling

($ide_t, oc_t, pib_t, pop_t$) the explanatory variables for the dependent variable "greenhouse gas emissions" (CO_2), the functional form of the model is as follows:

$$CO_{2t} = f(ide_t, oc_t, pib_t, pop_t), \quad [7]$$

(+) (-) (+) (+)

with:

- CO_{2t} , Greenhouse gas emissions in period t ;
- ide_t , FDI valued from net inflows of FDI at period t ;
- oc_t , The commercial opening at period t ;
- pib_t , Real economic growth in period t ;
- pop_t , The total population at period t.

4.1. Econometric Approach

The preferred econometric tool is the ARDL method. At least three reasons justify such a choice.

1°) ARDL is better suited for small sample sizes (Pesaran, Shin and Smith, 2001), whereas some techniques, such as Johansen cointegration, require a large sample to obtain a valid result (Ghatak and Siddiki, 2001);

2°) the ARDL can be applied if the variables used are all I (1), I (0), or mixed;

3°) The ARDL requires a reduced and simple form of the equation while other techniques will require a system of equations (Pesaran and Shin, 1999).

$$\ln CO_{2t} = a_0 + a_1 ide_t + a_2 pib_t + a_3 \ln oc_t + a_4 pop_t + e_t, \quad [8]$$

where, in addition to the previous notations, a_i represents the semi elasticities of the model to be estimated which express the sensitivity of the explained variable to the explanatory variables. $a_i (i = 0...4)$, with a_0 constancy and e_t , the error term at period t.

At least two arguments make it possible to justify such a presentation of the model. The first relates to the problem of non-normality, which is reduced with variables expressed in logarithmic form (Wooldridge, 2006). The second concerns the problem of endogeneity, which is solved because of delayed dependent variables as regressors (Wooldridge, 2006).

The error correction model of the ARDL model is as follows:

$$\Delta \ln CO_{2t} = a_0 + \sum_{i=1}^{\Delta} a_{1i} \Delta \ln CO_{2t-i} + \sum_{i=1}^{\Delta} a_{2i} \Delta ide_{t-i} + \sum_{i=1}^{\Delta} a_{3i} \Delta pib_{t-i} + \sum_{i=1}^{\Delta} a_{4i} \Delta \ln oc_{t-i} + \sum_{i=1}^{\Delta} a_{5i} \Delta pop_{t-i} + b_1 \ln CO_{2t-1} + b_2 ide_{t-1} + b_3 pib_{t-1} + b_4 \ln oc_{t-1} + b_5 pop_{t-1} + e_t \quad [9]$$

where, in addition to the previous notations, Δ is the first difference operator. $a_i (i = 0...5)$ represents the short-term dynamics of the model while $b_i (i = 0...5)$ represents the long-term relationship.

We will proceed in three stages. The first presents the unit root tests. It will be necessary to determine the order of integration of the variables. These tests are made from the ADF and AZ test. The second step concerns the cointegration test. The Engle-Granger two-step method (1987) will test the cointegration relationship between variables. After showing that the variables of interest are cointegrated, the third step, finally, relates to the analysis of the long and short-term dynamics between the variables of the model.

4.1.1. Stationarity of Series

The table 2 shows that all the series are integrated of order 1, except the IDE which is stationary at level. The series being integrated at different orders, the conditions required to perform the cointegration test at the Pesaran, Shin and Smith (2001) terminals are satisfied. However, applying the Bound test requires at least two steps. This is the determination of the optimal offset and the use of the Fisher test to test cointegration between series.

Table 2: Unit Root Tests

	Level			First difference			Constat
	ADF	AZ	Date de rupture/AZ	ADF	AZ	Date de rupture/AZ	
LNCO2	-3.10 (0.12)	-5.41 (0.08)	1989	-7.31 (0.00)	-8.29 (0.01)	1990	I(1)
IDE	-5.46 (0.00)	-15.71 (0.01)	1991	-	-	-	I(0)
PIB	-3.96*** (0.01)	-5.30*** (0.03)	2012	-7.42 (0.00)	-7.79 (0.01)	1989	I(1)
LNOC	-1.35 (0.85)	-1.72 (0.99)	1993	-4.27 (0.00)	-6.00 (0.01)	2011	I(1)
POP	-1.27 (0.87)	-4.61 (0.18)	1996	-3.75*** (0.03)	-5.81 (0.01)	1995	I(1)

Source: Synthesis of the Author from the results obtained on Eviews 9

(.) Probabilities; *** Stationary at 5 and 10 %.

4.1.2. Optimal Offset and Estimation of the ARDL Model

For the choice of the optimal ARDL model, namely the one that offers statistically significant results, we used the Schwarz (SIC) and Akaike (AIC) information criterion (Table 3).

Table 3: Optimum Offset Number

VAR Lag Order Selection Criteria						
Endogenous variables: LNCO2 IDE PIB POP LNOC						
Exogenous variables: C						
Included observations: 35						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-353.1326	NA	531.3459	20.46472	20.68691	20.54142
1	-244.1204	180.6488	4.444795	15.66402	16.99718	16.12423
2	-176.9177	92.16369	0.437419	13.25244	15.69656	14.09615
3	-128.5151	52.55137*	0.148269	11.91515	15.47023	13.14236
4	-84.23030	35.42787	0.086748	10.81316	15.47920	12.42388
5	-16.38517	34.89178	0.025101*	8.364867*	14.14187*	10.35909*

Source: Synthesis of the Author from the results obtained on Eviews 9

The offset number used corresponds to the lowest value of the AIC and SIC criteria, namely $h = 5$.

The result of the estimation of the optimal ARDL model is given in the following table.

Table 4: ARDL model (1, 3, 0, 0, 0)

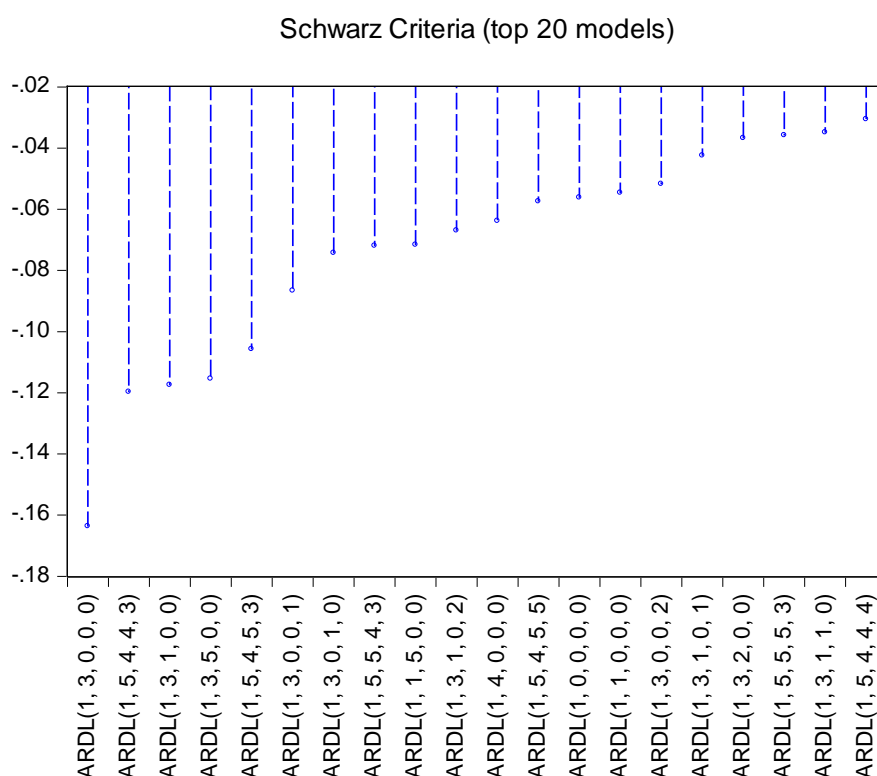
Dependent Variable: LNCO2				
Selected Model: ARDL (1, 3, 0, 0, 0)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNCO2(-1)	0.038519	0.169558	0.227170	0.8219
IDE	0.000380	0.000121	3.139613	0.0040
IDE(-1)	0.000374	0.000108	3.473201	0.0017
IDE(-2)	0.000257	0.000128	2.003056	0.0549
IDE(-3)	0.000343	9.90E-05	3.461266	0.0017
PIB	-0.002921	0.006144	-0.475382	0.6382
POP	0.158851	0.038543	4.121377	0.0003
LNOC	-0.636960	0.279332	-2.280293	0.0304
C	1.563598	1.145453	1.365048	0.1831

R-squared	0.750654	Durbin-Watson stat	2.192093
Adjusted R-squared	0.679412	F-statistic	10.53671
Prob(F-statistic)	0.000001		

Source: Synthesis of the Author from the results obtained on Eviews 9

The Chart 3 shows the twenty best models according to the Schwarz information criterion. The ARDL model (1, 3, 0, 0, 0) is actually the smallest CIS value.

Chart 3: Schwarz Information Criterion (SIC).



Source: Author from the results of the Eviews 9 software

The ARDL model estimated from the autocorrelation, heteroskedasticity, normality and specification tests should now be diagnosed (Table 5).

4.1.3. Model Diagnostic Tests

As the probability values are greater than 5%, the null hypothesis is accepted for all the tests. We therefore conclude that the model is statistically validated. Thus, the ARDL model (1, 3, 0, 0, 0) is globally good and accounts for 75% of CO₂ dynamics in Ivory Coast between 1975 and 2014.

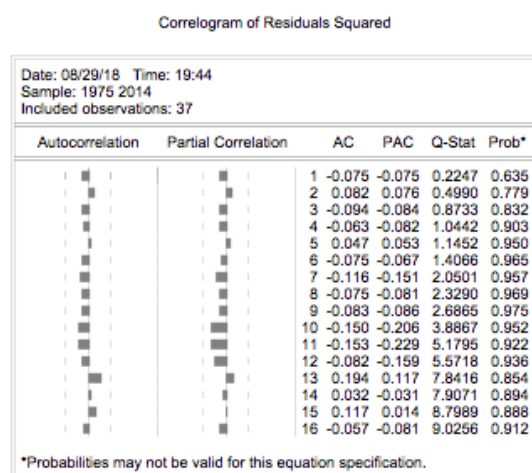
Table 5: Diagnostic Tests of the Estimated ARDL Model

Null Hypothesis	Tests	Values (Probability)	Conclusion
Absence of autocorrelation	Breusch-Godfrey (F-Stat)	1.41 (Prob. 0.25)	Absence of autocorrelation
Homocedastic errors	Breusch-Pagan-Godfrey	0.65 (Prob. 0.72)	Homocedastic errors
Normality of errors	Jarque-Bera	4.36 (Prob. 0.97)	Normality of errors
Well specified	Ramsey (t-stat)	0.17 (Prob. 0.86)	Well specified

Source: Synthesis of the Author from the results obtained on Eviews 9

To confirm the absence of the absence of autocorrelation of residuals, we constructed the correlogram of squares of errors (Chart 4).

Chart 4: The Corrologram of the Square of Residuals

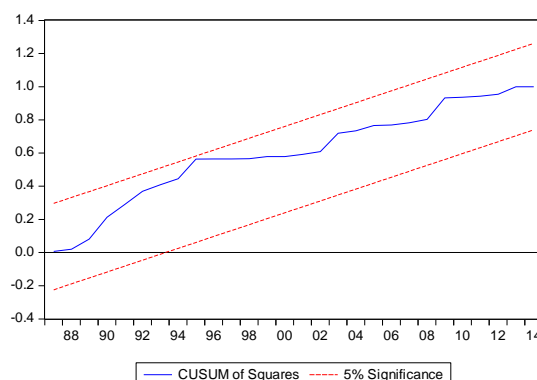
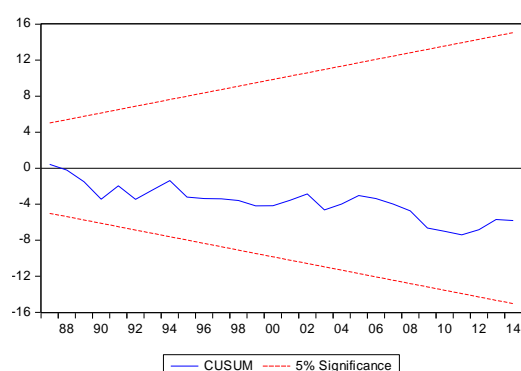


Source: Author from the results of the Eviews 9 software

The Q Ljung-Box statistic indicates that the terms are not significantly different from 0. The residuals are effectively uncorrelated.

In addition, the model is structurally stable and does not suffer from any point instability (Chart 6).

Chart 5: Stability of the Model



Source: Author from the results of the Eviews 9 software

4.1.4. Bound test and the Toda-Yamamoto causality test

Looking first at the results of the bounds test procedure (Table 6), we refer to the asymptotic critical values reported by Narayan (2005). The results indicate that the Fisher statistic (5.332474) is greater than the upper bound for the different significance thresholds. So we conclude that there is a long-term relationship between the different variables.

Table 6: Cointegration Bound Test

Model	F-statistic	K	Significance	I0 Bound	I1 Bound
LNCO ₂ et IDE, PIB, LNOC, POP	5.332474	4	10%	2.2	3.09
			5%	2.56	3.49
			2.5%	2.88	3.87
			1%	3.29	4.37

Source: Synthesis of the Author from the results obtained on Eviews 9

To determine the meaning of this relationship, the Toda-Yamamoto (1995) causality test is performed on the variables (Table 7).

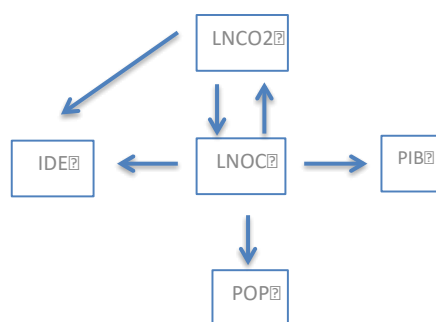
Table 7: Toda-Yamamoto's Causality Test

K	dmax	Variables dépendantes	Variables explicatives				
			lnco2	lnoc	ide	pib	pop
5	3	lnco2	—	6.58 (0.08)**	5.17 (0.15)	1.08 (0.78)	1.43 (0.69)
		lnoc	12.01 (0.007)*	—	6.12 (0.10)	3.92 (0.26)	1.10 (0.77)
		ide	6.73 (0.08)*	11.35 (0.01)*	—	1.90 (0.59)	3.54 (0.31)
		pib	6.20 (0.10)	7.62 (0.05)*	0.20 (0.97)	—	1.31 (0.71)
		pop	5.07 (0.16)	8.38 (0.03)***	4.24 (0.23)	4.50 (0.21)	—

Source: Synthesis of the Author from the results obtained from the Eviews 9 software

(.) : Probabilities; * significance at 1 % ; ** 10 % significance ; *** significance at 5 %.

The results show the absence of a causal relationship between CO₂ emissions and FDI in the direction of FDI. This lack of relationship may reflect the low CO₂ emissions caused by FDI inflows into Côte d'Ivoire between 1975 and 2014. The diagram below summarizes the possible causal links between the variables.



Two types of causality emerge: unidirectional and bidirectional causalities. For the first type of link, it is between trade openness and other variables, on the one hand, and between CO₂ emissions and FDI, on the other. More specifically, trade openness causes CO₂ emissions, FDI, growth and population. Likewise, CO₂ emissions cause FDI inflows. As for bi-directional causality, it only concerns commercial openness and CO₂ emissions where trade openness has an impact on CO₂ emissions and this influences trade openness.

4.1.5. ARDL Cointegration Test and Long-Term Form

The cointegrating ARDL test and the long-term form confirmed these results. Indeed, the term $u(-1)$ corresponds to the delayed residue resulting from the long-term equilibrium equation. Its estimated coefficient is negative and significantly different from zero; confirming the existence of an error-correcting mechanism (Table 8).

Table 8: The Cointegrating ARDL Test and the Long-Term Form

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDE)	0.000335	0.000106	3.152894	0.0038
D(IDE(-1))	-0.000619	0.000150	-4.133291	0.0003
D(IDE(-2))	-0.000391	0.000097	-4.030858	0.0004
D(PIB)	0.004086	0.004922	0.830052	0.4135
D(POP)	0.017543	0.210474	0.083350	0.9342
D(LNOC)	-0.289366	0.348617	-0.830041	0.4135
u(-1)	-0.955584	0.168255	-5.679388	0.0000
Cointeq = LNOC2 - (0.0014*IDE -0.0030*PIB + 0.1652*POP -0.6625*LNOC + 1.6262)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDE	0.001408	0.000229	6.147385	0.0000
PIB	-0.003038	0.006244	-0.486462	0.6304
POP	0.165215	0.032696	5.053091	0.0000
LNOC	-0.662477	0.233791	-2.833637	0.0084
C	1.626238	1.074734	1.513154	0.1414

Source: Synthesis of the Author from the results obtained from the Eviews 9 software

4.2. Results Interpretation

First of all, in the short term, the results show that all the coefficients have the expected sign. Specifically, they have a positive relationship between CO₂ emissions and FDI whose associated coefficient is significantly different from zero. This result suggests that the contribution of FDI to CO₂ emissions is minimal. Indeed, if FDI increases by 1 point (100%) then CO₂ emissions increase by 0.03%. However, these effects reverse over time. In other words, FDI inflows one and two years ago were favorable to reducing CO₂ emissions. For the other variables (GDP, POP and OC), their impact on CO₂ emissions is not significant.

For the long term, the error correction coefficient (u (-1)) indicates that when CO₂ emissions In Ivory Coast are above or below their equilibrium value, corrected 95.5% by the effect of "feed back". In addition, a shock noted during a year is completely absorbed after 1 year 15 days. Moreover, all the coefficients have the expected sign except economic growth.

More specifically, the results suggest that the increase in FDI will lead to an increase in pollution with a coefficient significantly different from zero. Like the short term, this result also shows that the contribution of FDI to CO₂ emissions is minimal in the long run because an increase in FDI of 1 point (100%) leads to an increase in CO₂ emissions of 0.14%.

Such results are not necessarily the result of rigorous and strengthened regulation of the environment (Since 2013, the government has taken measures prohibiting the import, manufacture and use of plastic bags that have not yet been applied). They result mainly from the fact that the pollution intensive goods consumed in Ivory Coast are imported goods. This is for example the clinker that goes into the manufacture of cement. In fact, cement production has been rising steadily since 2012 in Ivory Coast. However, clinker, a source of CO₂ emissions into the atmosphere is imported. This contributes to the low CO₂ emissions due to FDI inflows in Ivory Coast.

Regarding economic growth, its impact on CO₂ emissions is negative. This means that economic growth does not deteriorate the quality of the environment. However, the associated coefficient is not significantly different from zero.

On the other hand, the level of the population positively affects CO₂ emissions with a coefficient significantly different from zero. Indeed, a 1% increases in the total population causes a 0.16% increase in CO₂ emissions. The intuition of this result is that the larger the population, the more polluting the society is due to the human activities that contribute to the release of pollutants into the atmosphere.

As for commercial openness, its impact on CO₂ emissions is negative and significantly different from zero. The coefficient of this variable, which is equal to -0.66, suggests that a 10% increase in trade opening leads to a 6.6% reduction in CO₂ emissions in Ivory Coast. This result is in line with the classic theory of international trade which states that highly polluting (capital intensive) industries remain in rich countries while low pollution (labor) industries relocate to poor countries.

5. CONCLUSION

This article aimed to shed light on the links between CO₂ emissions and FDI inflows in Ivory Coast between 1975 and 2014, in a long-term perspective. We have shown that in the long term, FDI significantly increases CO₂ emissions but their influence is very low. Thus, according to the results of Al-Mulali (2012) and Zhang (2011) and unlike those Al-Mulali and Tang (2013), FDI does not reduce CO₂ emissions.

The improvement of the business, investment and trade climate in Ivory Coast, must be supported by social measures intended, in particular, to protect the health and safety of workers. Because environmental degradation due to an increase in emissions of CO₂ supplies can have a negative impact on human health and bring about a decrease of economic growth. However, nevertheless, a better consideration of the link between CO₂ emissions and FDI should be based on more accurate data on a fine decomposition of FDI that would significantly improve the relevance of the analysis.

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EMPLOYER'S LIABILITY REGARDING DOMESTIC WORKERS AND THEIR OCCUPATIONAL HEALTH AND SAFETY IN TURKEY

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ABSTRACT

Purpose- The aim of this study is to examine the employer's liability concerning domestic workers and their occupational health and safety in the Turkish legal system.

Methodology- The employer's liability concerning domestic workers and their occupational health and safety will be discussed in light of the Turkish legislation and views of scholars.

Findings- It is stipulated under Turkish Code of Obligations that the employer is obliged to take any type of measures and to keep tools and vehicles available as required to ensure occupational health and safety in the workplace.

Conclusion- Domestic workers are real workers and bearing this in mind the domestic workers have distinctive structures. New laws are necessary to guarantee decent occupational health and safety conditions. However, the law is not always sufficient to improve occupational health and safety conditions for a domestic worker. The topic of domestic workers is not only a legalisation or an absense of perception issue but also a community education challenge.

Keywords: Domestic worker, household employee, occupational health and safety, labour law, Turkish Code of Obligations No. 6098, The Code of Occupational Health and Safety, Health and Safety Law No. 6331.

JEL Codes: K31, K32, J81

1. INTRODUCTION

The increase of educational level and social changes enabled more women to join the labour markets. Women have begun to participate in working life markedly. However, participation in the labour market and having a job, did not exclude the traditional division of domestic tasks in most countries (ILO, 2010: 6). The house responsibilities which have been traditionally assigned as women's work still remains. Therefore, it has needed to be transferred to another woman. Household employees who are named domestic workers filled the gaps and inefficiencies between the working womens' work and their house responsibilities (ILO, 2012: 1; Sarıbay Öztürk, 2016: 172).

Because of the name similarities, homeworkers and household employees can be perceived to serve the same purpose. It should be noted that household employees, or so named domestic workers, and homeworkers are strictly different. A homemaker who for a fixed rate of remuneration, carries out their work in his or her home for an employer who is not the final consumer of the product or service provided (Huws and Podro, 1995: 2). On the other hand, domestic workers typically work in private homes performing various household tasks such as cleaning the house, cooking, washing and ironing clothes, taking care of children, or the elderly and sick members of a family, gardening, guarding the house, and driving for the family (Albin and Mantouvalou, 2011: 2; ILO, 2012: 1). Ultimately, a household employee/ a domestic worker performs her/his work inside the employer's home.

According to the International Labour Organization (ILO), at present there are at least 67.1 millions adult domestic workers all around the world. Additionally, this number is likely to be much larger due to the high informality and irregularity in the sector, as well as the lack of reliable statistics. On the other hand, among the 67.1 million estimated domestic workers

globally, the domestic work sector is largely comprised of female workers, approximately 80 percent are women ((ILO, 2016: IX).

With reference to the data from the Social Security Institution, as of July 2017, the number of insured employees who paid their premiums by the employers and working in domestic services was 42.562, and the number of insured employees working less than ten days per month was announced as 6.124.

Moreover, according to the Turkish Statistical Institution data of April 17, 2017, the rate of informal workers constitutes 32.5% of total employment.

Domestic work has been characterized as being precarious employment; due to the social and psychological tenuousness, the economic reasons, being undervalued, poorly regulated, as well as the workplace being inside private homes, often becoming invisible (Johnstone, 2013: 17). In addition to this, there high risks of ill-health.

There is a complexity to the employment relationship for domestic workers, exclusion from social protection, the lack of a stable job description and the special character of the working space, make occupational health and safety measures more important for domestic workers (Ulutaş and Öztepe, 2013: 44).

This study aims to shed some light on the current situation and the problems domestic workers face in the field of occupational health and safety and to develop solutions for these problems.

2. REGULATION OF DOMESTIC WORKERS FIELD OF OCCUPATIONAL HEALTH AND SAFETY IN ILO AND IN TURKEY

At the present moment, ILO Convention No. 189 and Recommendation No. 201 have the most important instruments on domestic work. In the 100th Session of the International Labour Conference, in June 2011, the International Labour Organization adopted Convention No. 189 and supplementing Recommendation No. 201 regulating the terms and conditions of work for domestic workers (Albin and Mantouvalou, 2011/1: 9; Blackett, 1998: 6; Erdoğan and Toksöz, 2013: V)

ILO Convention No. 189 strives to guarantee that domestic workers have equal health and safety conditions and labour rights same as the other types of workers. Article 13(1) states the following: "Every domestic worker has the right to a safe and healthy working environment. Each Member shall take, in accordance with national laws, regulations and practice, effective measures, with due regard for the specific characteristics of domestic work, to ensure the occupational safety and health of domestic workers." Unfortunately, ILO Convention No. 189 has not yet been ratified by Turkey.

Currently, domestic workers are excluded from the scope of Labour Law No. 4857 by the virtue of Article (4): "The provisions of this Act shall not apply to the activities and employment relationships mentioned below". Consequently, domestic services are one of the employment relationships mentioned in Article 4 (Article 4/(e)). Therefore, domestic workers are exempted from coverage under Labour Law No. 4857 regarding labour relations and are only protected by the Turkish Code of Obligations No. 6098 (TCO.). The provisions of Turkish Code of Obligations No. 6098 on service contracts and its general provisions are applicable to domestic workers (Caniklioğlu, 2012: 34; Ocak, 2012: 116; Özdemir, 2014: 114; Baycık, 2013/3: 110; Sarıbay Öztürk, 2017: 31).

Almost all over the world, occupational health and safety regulations, which aim to prevent injury or illness in the workplace, protect formal workers in formal work environments such as mines, factories, offices and shops. These regulations do not protect workers who work in private homes, which means that even though domestic work is such vital source of employment, and even though there are many health and safety risks involved in this work, and even though domestic workers are vulnerable to poverty if they become sick or injured, aforesaid legislation in many countries does not cover them (Alfers, 2011: 3).

Despite the fact that The Code of Occupational Health and Safety includes as many people as possible within its scope in principle, domestic workers are excluded from the scope of The Code of Occupational Health and Safety. This exclusion is criticized by the doctrine and evaluations are different from each other (Centel, 2013: 82-83; Ertürk, 2012: 14; Caniklioğlu, 2012: 34; Ocak, 2012: 116; Özdemir, 2014: 113-114; Baycık, 2013/3: 110; Sarıbay Öztürk, 2015: 8-10). On the other hand, the Turkish Code of Obligations No. 6098 on health and safety provisions are applicable to domestic workers. Consequently, the domestic workers are not completely unprotected by health and safety legislation. Even though Turkish Code of Obligation stipulates a general article regarding the occupational health and safety of the worker, The Code of Occupational Health and Safety arranges the things which the employer should do to perform mentioned obligation at full length. As a matter of fact, The Code of Occupational Health and Safety has a wider assertion than Turkish Code of Obligations No. 6098.

3. HEALTH AND SAFETY RISKS FOR DOMESTIC WORKERS

Homes present a number of health and safety risks for the people who work in them (Alfers, 2011: 3). A study prepared in Salvador, Brazil, found women domestic workers experienced higher rates of injury than women workers in other occupations (Santana et al., 2003: 70).

Health and safety risks for domestic workers can be classified at four headlines. First one is physical risks, second one is chemical risks, third one is biological risks and the last one is psychosocial risks (Ulutaş and Öztepe, 2013: 50).

Physical risks are derived from carrying heavy weights, being forced to climb up to high places, cutting or burning in the kitchen.

Domestic workers contact with toxic or unhealthy substances as another important health and safety risk; labeled as, chemical risks. Very seldom an employer will supply protective equipment such as gloves or masks (Alfers, 2011: 11). Therefore, domestic workers are frequently faced with skin and respiratory tract diseases.

The lack of protective equipment also causes biological risks, when domestic workers are caring for sick members of the household. Particularly if the ill employer has infectious diseases such as HIV/AIDS and/or tuberculosis, the domestic workers are confronted with these biological risks to themselves (Alfers, 2011: 12; Ulutaş and Öztepe, 2013: 50).

The verbal abuse and humiliation they suffer at their places of work is another serious health and safety problem. A lot of employers behave as if the domestic worker is their slave, treating them as if it is demeaning work. The domestic worker is often disrespected (Alfers, 2011: 8). Moreover, the working hours are unpredictable, exhausting and monotone. In consideration of the foregoing, domestic workers feel like the work they do is nonsense.

4. PROVISIONS OF TURKISH CODE OF OBLIGATIONS NO. 6098 PERTAINING TO THE OCCUPATIONAL HEALTH AND SAFETY OF DOMESTIC WORKERS IN TURKEY

Turkish Code of Obligations No. 6098 did regulate occupational health and safety provisions of domestic workers. The mentioned provisions are stipulated between Articles 417 and 419.

It is regulated under Article 417 of the Turkish Code of Obligations that the employer is obliged to protect and respect worker's personality and keep a reliable and fair order within the workplace, to take required measures for workers not to come to psychological and sexual abuse and those who have suffered such abuses not to suffer any further damage (TCO. A. 417/I).

The same article also stipulates that the employer is obliged to take any type of measures and to keep tools and vehicles available as required to ensure occupational health and safety in the workplace; workers as well are obliged to observe any kind of measures that have been taken regarding occupational health and safety. (TCO. A. 417/II).

The case-law of the Supreme Court and the teaching state that, any kind of measures should be determined according to science, technic and experience's situation and level reached at that time (Caniklioğlu, 2012: 34; Ekonomi, 1987: 154-155; Güzel, 2003: 19; Özdemir, 2014: 66-69; Soyer, 2003: 33; Süzek, 1985: 179-180; Y10HD, 27.5.2008, 2626/7283; Y10HD, 4.3.2008, 6310/282 www.hukukturk.com.tr, 01.12.2018)

The employer can not shuffle off this liability on the grounds of his/her economical inadequacy, lack of experience, the ignorance of scientific and technological developments or practices in the case of not taking these measures in similar works (Süzek, 1985: 245-245).

Since The Code of Occupational Health and Safety clearly excludes domestic services, taking any kind of measures does not translate into enacting The Code of Occupational Health and Safety Article (2/2, c). However, Article (2/2, c) which regulates general responsibilities of employers can be used as a guiding principle.

In addition to this, the responsibilities which are distinctly regulated in The Code of Occupational Health and Safety, such as designating workers as an occupational safety specialist, occupational physician and other health staff, preparing emergency plans or receiving medical reports, shall not be an obligation for the domestic worker's employer. However, the domestic worker's employer shall identify the risks which are linked to the working environment and which the workers are exposed. As it is mentioned before, the employer shall determine any kind of measures pursuant to science, technic and experience's situation and level reached at that time.

Another key point to be emphasized is the exact meaning of "keeping tools and vehicles in full available required to ensure occupational health and safety in the workplace". There is no doubt that employer should supply the kit which is required for the work. Despite the fact that, the bottom line is completely dissimilar. To illustrate, before cleaning the house is it sufficient to supply the cleaning materials or should the employer (landlord/landlady) inspect the materials in terms of which are harmful to health or not. Additionally, should the employer forbid the worker from wiping the windows if the

window is high and there is no precaution for falling. Afterwards, the dispute will be whether the employer will be found to be fault with the case or not.

Despite the general usage and customs disallowing the domestic workers to be categorized as a real employee and the landlady/landlord as a real employer, the truth is that they are both parties of an employment contract. The Law which is applicable to them is the Turkish Code of Obligations No. 6098, as it indicates that the employer is obliged to take any kind of measures and to keep tools and vehicles in full available required to ensure occupational health and safety in the workplace. Supportively according to court decisions and the expert reports, keeping tools and vehicles in full available has been interpreted that it is not just the keeping tools or vehicles in full but also to procure them in a healthy way. Furthermore, if it is impossible to ensure occupational health and safety in the worksite, the employer shall forbid the hazardous duties.

In respect to this, there have been many court decisions, especially domestic worker's who have fallen from high. In the years 2013 and 2014, two domestic workers (Rukiye Şimşek and Fatma Aldal) died because of falling from high while wiping the window. According to the accident report and court decisions, the defendant landlady was found to be primary at fault and decedent domestic worker was at secondary fault (for further information, www.bianet.org). Contrary to popular belief, breaching the domestic worker's occupational health and safety liabilities can cause serious consequences to the employers.

In point of fact working in a private home causes difficulties regarding occupational safety and health requirements, as many employees – and almost all governments regard the home as “safe” and perceive the labour inspection in private homes as a breach of privacy. Therefore valuing the employer's right to privacy above the domestic worker's right to safety and health at work (ILO, 2010: 61–62; Johnstone, 2013: 17). Nevertheless, the workplace which is the home for the landlady should be made controllable and inspectable. At that point in order to not to breach security of the domicile, the obligatory declaration from the employer about the preventive measures could be acceptable.

Consequently, the law is not always sufficient to improve conditions for a domestic worker. Since, if the employee did not aware of their rights and if domestic worker did not demand it, having a claim is worthless. Many domestic workers are simply not aware of their rights with regard to health and safety. Not only the government but also organizations of domestic workers need to make a concerted effort to educate domestic workers about their rights and to ensure aforesaid rights are upheld (Alfers, 2011: 16).

5. THE OCCUPATIONAL HEALTH AND SAFETY RESPONSIBILITIES OF EMPLOYER'S FROM TURKISH CODE OF OBLIGATIONS AND TURKISH PENAL CODE

Responsibilities arising from an employer's breach of their duty to protect the employee can be divided into two parts. One of them is the compensation responsibility which arises from private law via Turkish Code of Obligations. The other one is the criminal responsibility via Turkish Penal Code (TPC.) (Özdemir, 2014: 535-630).

As it was mentioned above, it is stipulated under Article 417/II that the employer is obliged to take any kind of measures and to keep tools and vehicles available required to ensure occupational health and safety in the worksite; workers as well are obliged to observe any kind of measures taken regarding occupational health and safety.

In witness whereof, indemnifying the death of worker, injuring physical integrity, or any damages depending on the violation of personal rights due to any act of the employer contrary to the law and contract including the above provisions, are subject to provisions of liability resulted because of being contrary to the contract (Article 417/III). Aforesaid liability give a rise to pecuniary compensations. That means the employer would be liable to pay compensation to the employee or the relatives of the deceased. Various compensation articles are regulated and named as material compensation, immaterial compensation or compensation for loss of support.

After all, according to the Turkish Code of Obligations, the employers have a statutory obligation when domestic worker could not benefit the social security institution's contributions. Titled as “when working in household organization” regulates in Article 418 that if the worker works in a household organization together with the employer, then the employer is obliged to provide adequate food and a proper shelter. If the worker fails to fulfill performance of work without his default due to illness or accident the employer is obliged to meet the care and treatment of the worker for two weeks if employed for up to one year and not entitled to benefit from social insurance supports. For every service year of the worker the said period is increased by two days for each service year provided this term is not to exceed four weeks. The employer is obliged to fulfill the same obligations in the case of worker's pregnancy or giving birth (TCO. A. 418).

As it was mentioned above, the responsibilities arising from the employer's breach of their duty to protect the employee can be a criminal responsibility as well. The criminal responsibility via Turkish Penal Code can be reckless killing (TPC. A. 85) or reckless injury (TPC. A. 89).

It is stipulated under Article 89/1 of the Turkish Penal Code that a person who recklessly causes another physical pain or who impairs another's health, or ability to perceive, shall be sentenced to a penalty of imprisonment for a term of three months to one year, or a judicial fine. Moreover, this fine is gradually increased based on the assessment of damage and the number of wounded man (TPC. A. 89/2, 3, 4).

Turkish Penal Code is also stipulated under Article 85 that any person who causes the death of another by reckless conduct shall be sentenced to a penalty of imprisonment for a term of two to six years. If the act results in the death of more than one person, or the injury of more than one person together with death of one or more persons, the offender shall be sentenced to a penalty of imprisonment for a term of two to fifteen years.

6. CONCLUSION

Domestic workers are excluded from the scope of Labour Law No. 4857 and The Code of Occupational Health and Safety. They are in the scope of the Turkish Code of Obligations No. 6098, regarding both labour relations and health and safety provisions. Especially, domestic workers are separated from real workers by the national laws. It should be admitted that domestic workers have sui generis features and this special character should be taken into consideration while regulating the provisions relating to domestic workers. Nevertheless, contrary to popular belief, domestic workers are real workers and they deserve to be treated as real workers the same as other workers.

For the first time, the International Labour Organization via ILO Convention No. 189 and Recommendation No. 201 regulated the terms and the conditions of decent work for domestic workers. Correspondingly, some countries have regulated their national law in parallel with aforesaid provisions. The expectation is the ratification of ILO Convention No. 189 by Turkey and the realisation of the necessary amendments in the domestic legislation (Saribay Öztürk, 2016: 176-178; Saribay Öztürk, 2017: 47).

In summary, either new provisions in Law No. 6331 or a entirely new law, is needed to ensure decent labour conditions. One specific to domestic labour and the unique conditions the domestic worker's conditions. Both of them can be defended and criticized equally. As it was mentioned before, the bottom line is the need for regulating provisions regarding the domestic workers; they are real workers and bearing this in mind the domestic workers have distinctive structures.

It is a fact that the inclusion of domestic workers within the scope of the The Code of Occupational Health and Safety would have positive physical effects. However, domestic workers and their workplaces have sui generis specialities. Therefore, even domestic workers are included in the scope of Law No. 6331, the provisions should be specialised for domestic workers. The second option which appears to us more persuasive, is conducting a more comprehensive Law for just domestic workers (Saribay Öztürk, 2017: 47). Especially in order to prevent occupational accidents and professional diseases concerning the domestic work sector, the risk factors should be analysed, culminating in preventive measures that should be made obligatory. Put in a nutshell, in the recent years, Labour Courts have signed many decisions which will raise awareness in the issue of occupational health and safety of domestic workers. Nevertheless, there still isn't any legal arrangement other than the Turkish Code of Obligations.

According to the Turkish Code of Obligations No. 6098, responsibilities arising from an employer's breach of the duty to protect employee can be compensation responsibility such as material compensation, immaterial compensation or compensation for loss of support or criminal responsibility such as reckless killing or reckless injury. In order to prevent employer's breach of duty to protect an employee, the workplace should be controllable and inspectable. It is surely beyond doubt that in the conflict between an employers' privacy and the domestic workers' decent working conditions, the former often overrides (Mantouvalou, 2012: 6). As it was stated above in order to not breach the security of the domicile, the compulsory declaration from the employer outlining and guarantying the preventive measures can be acceptable.

Domestic work has been traditionally assigned to women in the vast majority of societies and considered worthless by the same society. Domestic work's low status contributes to employers treating domestic workers poorly. In contrast, domestic work is important work and this message needs to be present explicitly to the public as a whole and to employers of domestic workers in particular (Alfers, 2011: 16).

The problem for domestic workers is not only the deprivation from legal regulation but also the existence of a gap between the formal legal entitlements of the domestic workers and their treatment in practice (Saribay Öztürk, 2016: 171). Much more research needs to be conducted, specifically in occupational health and safety. For instance, a study which shows the impact on domestic worker's bodies of activities like lifting, pulling, pushing, sweeping, bending over, and standing for long periods, as domestic workers commonly do. This kind of research may help convince policymakers and employers that protecting the health of domestic workers at work is significant. (Alfers, 2011: 16).

Much work still has to be done in this regard. Bearing in mind that the topic of domestic workers is not only a legalisation or an absense of perception issue but also a community education challenge. Many domestic workers do not know their

rights, so they are unable to demand protections from their employers. The underlying reason for the problem is, so many domestic workers have come from poor backgrounds, often have little education, and are isolated from other workers. Furthermore, in order to change the circumstances of the domestic workers, it should be started from somewhere. Bringing domestic workers into the light, not leaving them in the shadows of the labour market could be the starting point. Not only the government but also the organizations of domestic workers have to make a concerted effort to educate the domestic workers about their rights and to ensure these rights are upheld.

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RUIN PROBABILITIES IN DEPENDENT INSURANCES WITH AUTOREGRESSIVE MODEL

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ABSTRACT

Purpose- Risk analysis and ruin probabilities were calculated with the assumption of independence in the past, however this assumption does not reflect the reality at the present time. Today, insurance activities are more advanced, and consumers are more informed, for this reason existence of dependency between insurance branches within the portfolio of an insurance firm, is unavoidable. Aim of this study is to calculate the ruin probability for two dependent insurance branches.

Methodology- In this study, monthly claim data of a leading insurance firm which belongs to two different insurance branches namely traffic and health, in the period of 2007-2016 are used.

Findings- In the case of fixed interest rate and initial capital, it's found that if dependence of insurance branches decreases, ruin probabilities decrease.

Conclusion- In the case of fixed interest rate and initial capital, to decrease the ruin probability, dependence of branches should be decreased. To lower the dependence, collected premiums should be increased, thus lower adjustment coefficients can be obtained. Accordingly, with the lower adjustment coefficient, ruin probabilities can be decreased.

Keywords: Ruin probability, dependent ruin probability, multivariate autoregressive process (MAR(1)), 2-parameter exponential distribution.

JEL Codes: C32, G22, I13

1. INTRODUCTION

History of insurance goes long way back. First insurance policy was done in Italy in late 14. century. With marching along time, insurance transactions were rapidly developed in 20. century. While insurance activities were concentrated especially on sea transportation in the past, insurance activities for different branches were began to be done. Since insurance transactions for different insurance branches were evaluated independently till 1990s, transactions and models with assumption of independence were done. However especially from the beginning of 1990s, along with the rise of different insurance transactions for same person or organizations, any claim existed in one policy began to affect another policy directly. For this reason, independence assumption used in calculations and models fell from favor.

Especially for modern day insurance firms, it is so difficult to accept independence assumption in many calculations like modelling processes, claims and determining claims' distributions etc. Therefore, independence assumption lost validity in modelling ruin probabilities too.

In this study firstly dependent ruin probabilities and classic ruin probabilities in actuarial models, types of dependences and dependent ruin probabilities were mentioned. In the second part, autoregressive model used in dependent ruin probabilities was discussed. In practice part, monthly claim data of a leading insurance firm which belongs to two different insurance branches namely traffic and health, in the period of 2007-2016 are used and by establishing autoregressive model and analyzing dependence level of delayed values, dependent ruin probabilities were tried to calculate.

2. LITERATURE REVIEW

Wu and Yuen (2003), proposed a discrete time risk model (interactive model) for interactive dependent classes of firms. They argued that within the context of this model, any risk existed within a class, is affected not only from its own risk, but also risk from other classes. They firstly explained interactive model through number of distribution family and then compared with other results from literature by numeric example. Consequently, they showed that if numbers of dependent classes increase, risk increases.

Wan, Yuen and Li (2005) studied discrete time risk model with m -number ($m \geq 2$) dependent classes of insurance firm. Its assumed that claim processes for m number classes fit multivariate autoregressive time series. In the study, by assuming claims are limited as exponential in proposed claim model, ultimate ruin probability was investigated. By taking claims with two parameter exponential and gamma distributions, examples were given with simulations.

The study done by Cai and Li (2007) focused on three commonly used ruin probabilities and showed how some ruin probabilities increase by using comparison methods and how ruin probabilities decrease with the rise of claim dependences. Paper also offers explicit calculated limits with multivariate phase type distributed claims for these ruin probabilities. Besides, shows performance of these limits for multivariate composed Poisson risk models with mildly or highly dependent Marshall – Olkin exponential claim amounts.

Dağlıoğlu and Erdemir (2008a), discussed process distributions which fit moving autoregressive average models related to insurers income and premium and claim processes' first order autoregressive models when premiums are collected in fixed amounts. They investigated the effects of changes in process mean, initial capital and interest rate and dependence between claims' present and past periods on ruin probabilities. Simulation technique was applied for experimental results and consequently they showed every factor has special effects on ruin probabilities.

In Dağlıoğlu and Erdemir's (2008b) study, explanation of premium and claim variables of dependent insurance branches within a portfolio fitting multivariate first order autoregressive model was done with numeric examples. Ruin probabilities were calculated with data generated by simulation in case of premiums are collected as fixed c amount at the beginning of period and claim processes fit two variables first order autoregressive model. They concluded changes in initial capital, interest rate and fixed premium amounts influenced upper limits of ruin probabilities.

Liosel and Lefevre (2009) discoursed on two generalized models which combined poisson risk model and claims fit Poisson distribution. They focused not only the inhomogeneity in premium amounts and claims, but also probable dependency between claim amounts. They discussed on ruin probability calculations for these risk models.

In the study done by Heilpern (2009) two-dimension, dependent Poisson risk process was investigated. Claims were separated into two different classes and its been thought that in every class claims can have same distribution and claims in different classes can have different distributions. Besides, effects of claim classes dependency on ruin probabilities were investigated with the assumption of dependency of claim count processes.

Cossette, Marceau and Deschamps (2010) discussed dependency of claim distribution numbers for each period with various time series approaches (Poisson moving average process (Poisson MA(1)), Poisson autoregressive process (Poisson AR(1)), Markov-Bernoulli process and Markov transition process) in their study. They gave numerical examples to compare the results. They investigated relationship between adjustment coefficient and dependency coefficient for every process and their effects on ruin probabilities. Consequently, they stated that there is a relationship between adjustment coefficient and dependency coefficient and accordingly ruin probabilities were influenced from this situation.

In Gu (2013)'s study, being focused on Farlie-Gumbel-Morgenstern (FGM copula) rested claim amounts and expansion of risk model which has dependency between claim times. For this purpose, Erlang (2) dependent risk model, generalized Lundberg disequilibrium and integro-differential equation which is Gerber-Shiu penalty function were derived.

Jiang and Yang (2016), expanded compound Poisson distribution with FGM copula to examine the distribution of maximum residuals before ruin in case claim depends on time occurred. They derived integro-differential equilibrium with specific limit conditions for the distribution provided Laplace transformation.

3. THE CONCEPTUAL FRAMEWORK

3.1. Actuarial Dependency

The idea of claims which will occur in calculations of ruin probabilities and claim amount are independent and random was popular in actuary for long years. However, with the developments in insurance transactions, it was seen by firms that insurances affect each other significantly. For this reason, studies in actuary science, went towards dependency assumption, instead of assumption of independency.

It is possible to mention two types of dependency in actuarial models. First type of dependency arises between policies of one firm's different insurance branches or between different insurance branches directly. On the other hand, second type can be stated as the dependency between claim or premium processes and past claim and premium processes. (Dağlıoğlu and Erdemir, 2008a: 106).

For an insurance firm, relationship between claim amounts which make S , the probable total claim amount, can be handled within the concept of common monotony and correlation. Wang and Dhaene (1998), explain common monotony and correlation concepts as follows:

Cumulative distribution function for a claim amount, X (X real valued nonnegative random variable with finite average) is shown as (cdf) $F_X(x) = P\{X \leq x\}$, and for another claim amount Y (Y so as to provide same conditions) as cdf $F_Y(y) = P\{Y \leq y\}$. Joint cumulative distribution function is shown as $F_{X,Y}(x,y) = P\{X \leq x, Y \leq y\}$ for X and Y claim couple (Y_1, Y_2)

$$F_{X,Y}(x,y) = P\{X \leq x, Y \leq y\} = \min(F_X(x), F_Y(y)) \quad \forall y_1, y_2 \geq 0 \quad (1)$$

If its ensured, X and Y called as common monotony. (X_1, Y_1) and (X_2, Y_2) , as being two member of $R(F_X, F_Y)$, one of the equalities below must be provided, to obtain that (X_1, Y_1) couple has a lower correlation than (X_2, Y_2) . f and g functions are as nondecreasing functions,

$$\text{Cov}(f(X_1), g(Y_1)) \leq \text{Cov}(f(X_2), g(Y_2)) \quad (2)$$

$$F_{X_1, Y_1}(x, y) \leq F_{X_2, Y_2}(x, y) \quad \forall x, y \geq 0 \quad (3)$$

3.2. Ruin Probability

Classical ruin theory was proposed by Lundberg in 1907 and developed by Cramer in 1930. This theory can be defined as, evolution of an insurance firm's fiscal surplus (difference between collected premiums and claims in a period, in case Premium amount is more than claims) along a period of time. According to the assumption of classical ruin theory, insurance firm begins with initial capital and collects a fixed amount of premiums continuously. Ruin occurs when the money paid by firm (claim amount) is more than the collected money (premium amount). In other words, if fiscal surplus is equal to zero or negative (Tse, 2009: 143), ruin exists. In actuary science, ruin probability is used as a risk measure. In accordance with this purpose, actuaries and scientists study on new models by using advanced mathematical techniques to use at calculation of ruin probabilities. These studies increased the interest on ruin theory not only theoretical but also practical (Yang, 2003: 135).

Generally, in investigation of ruin theory, two different approaches are used namely, discrete time processes and continuous time processes. In discrete time processes, X_n shows premiums collected from the beginning of period n to time n , Y_n presents claims paid till the end of n period and R_n presents short term interest rate in n . period. Thus, surplus at the end of n period, U_n can be defined as follows (Yang ve Zhang, 2006; 290):

$$U_n = (U_{n-1} + X_n)(1 + R_n) - Y_n \quad (4)$$

At equation (4), X_n , R_n and Y_n are independent identically distributed random variables. Ruin occurs if expected value of claim payments in a period is more than expected value of collected premiums in the same period. Accordingly, $\psi(u)$ as showing ultimate ruin probability, can be shown as follows.

$$\psi(u) = P(T(u) < \infty) \quad (5)$$

Then, getting a negative value for the first time at $T(u)$, which means ruin probability for a process, begins with u initial capital, can be expressed as (5). If there is no claim payment at any "1" time with a probability of $f_X(0)$, residuals pile towards 1 and then ultimate ruin probability is $\psi(1)$ (Tse, 2009: 146). This can be shown as follows:

$$\psi(0) = f_X(0)\psi(1) + S_X(0) \quad (6)$$

Here $S_X(0) = 1 - F_X(0) = P(X \geq 1)$. Similarly, if $u = 1$, then $\psi(1)$ can be calculated as:

$$\psi(1) = f_X(0)\psi(2) + f_X(1)\psi(1) + S_X(1) \quad (7)$$

If these calculations are generalized, following equation can be obtained.

$$\psi(u) = f_X(0)\psi(u+1) + \sum_{j=1}^u f_X(j)\psi(u+1-j) + S_X(u), \quad u \geq 1 \quad (8)$$

After rearranging equation (8), ultimate ruin probability can be written as follow:

$$\psi(u+1) = \frac{1}{f_X(0)} \left[\psi(u) - \sum_{j=1}^u f_X(j) \psi(u+1-j) - S_X(u) \right] \quad u \geq 1 \quad (9)$$

To apply this equation, $\psi(0)$ the initial capital given at following theorem is needed. For discrete time residual model, it is $\psi(u) = \mu_X$. Here μ_X represents expected value of claims paid and can be calculated as below:

$$\psi(0) = \sum_{u=0}^{\infty} S_X(u) = \mu_X \quad \text{or} \quad \sum_{u=0}^{\infty} f_X(u) S_X(u) = \mu_X \quad (10)$$

On the other hand, in continuous time ruin models, its assumed that claim occurrences fit Poisson distribution. If $\{S_t: t \geq 0\}$ shows total claim process and X_j represents j 'nd claim process (Heilpern, 2009: 77);

$$S_t = \sum_{i=1}^{N_t} X_i \quad \text{and} \quad U_t = u + ct - S_t \quad (11)$$

equation can be written. $(0, t]$ showing net premium revenue, c showing premium amount in unit of time, premiums can be expressed with ct . If at any time period, premium revenue of insurance firm is more than expected value of claims paid at the same period is accepted, then $c > \lambda m$ can be said. Thus, following relation can be obtained.

$$c = (1 + \theta) \lambda m \quad (12)$$

$\theta > 0$, is called premium loading factor; λ , concentration parameter of poisson distribution and $m = E(X_i)$. According to equations thus far, $U_0 = u$ as being initial capital, T time of ruin and ruin probability ($\psi(u)$) can be calculated as follow:

$$T = \inf\{t: U_t < 0\} \quad (13)$$

$$\psi(u) = P(T < \infty | U_0 = u) \quad (14)$$

When U_t is negative, ruin occurs. If $c \leq \lambda m$ then $\theta \leq 0$ and this time $\psi(u) = 1$.

Zang et al. (2007), stated total residual amount of firm U_n as,

$$U_n = U_{1n} + U_{2n} + \dots + U_{pn} \quad n \geq 0 \quad (15)$$

if number of dependent insurance branches is p . Here $U_0 = u = u_1 + u_2 + \dots + u_p$ is sum of initial capitals.

3.3. Ruin Probability in Dependent Insurance

$1 \leq i \leq p$ and W_{in} , shows total premium amount collected at period n and Z_{in} shows claims paid at the same period. W_{in} and Z_{in} being nonnegative random variables, if premium amount collected at period n is collected at the beginning of period and claims paid at the same period is paid at the end of period is assumed, total residual amount U_n can be expressed as follow:

$$U_n = u(1+r)^n + \sum_{i=1}^p \sum_{k=1}^n W_{ik}(1+r)^{n-k+1} - \sum_{i=1}^p \sum_{k=1}^n Z_{ik}(1+r)^{n-k} \quad (16)$$

Here r is the fixed interest rate. U_n can be written by matrices as follow:

$$U_n = v^{-1} U_{n-1} + v^{-1} \mathbf{1}'_p \mathbf{W}_n - \mathbf{1}'_p \mathbf{Z}_n \quad n \geq 1 \quad (17)$$

$v = (1+r)^{-1}$ shows discount factor, $\mathbf{1}_k$, k -dimension column vector composed of 1s, $\mathbf{W}_n = (W_{1n}, \dots, W_{pn})'$ column vector of fixed premium amount collected at the beginning of n 'nd period and $\mathbf{Z}_n = (Z_{1n}, \dots, Z_{pn})'$ column vector of claim amount paid at the end of period n . So, T showing the time of ruin, ruin probability $\phi(u, \mathbf{w}, \mathbf{z})$ is expressed as;

$$T = \min\{n \geq 0: U_n < 0\} \quad \min \varphi = +\infty \quad (18)$$

$$\phi(u, \mathbf{w}, \mathbf{z}) = P(T < \infty | U_0 = u, \mathbf{W}_0 = \mathbf{w}, \mathbf{Z}_0 = \mathbf{z}) \quad (19)$$

Here u shows initial residual, \mathbf{w} initial premium and \mathbf{z} claims paid. Also ruin probability, R the adjustment coefficient, can be expressed as below:

$$\phi(u, \mathbf{w}, \mathbf{z}) \leq \frac{e^{(-R\hat{u})}}{E[e^{(-Rv^{-1}\hat{U}_T)} | T < \infty]} \quad (20)$$

\hat{U}_N and its components can be calculated as follows.

$$\begin{aligned}
\hat{U}_n &= U_n + \mathbf{a}' \mathbf{W}_n - \mathbf{b}' \mathbf{Z}_n \\
U_0 &= \hat{U} = u + \mathbf{a}' \mathbf{w} - \mathbf{b}' \mathbf{z} \\
\mathbf{a} &= (\alpha_1, \dots, \alpha_p) \text{ ve } \mathbf{b} = (\beta_1, \dots, \beta_p) \text{ constant vector} \\
(\mathbf{a}', \mathbf{b}') &= (\mathbf{1}'_p - \mathbf{v} \mathbf{1}'_p) \mathbf{A} (\mathbf{I}_{2p} - \mathbf{v} \mathbf{A})^{-1} \\
\mathbf{A} &= \begin{pmatrix} \mathbf{A}_1 & \mathbf{A}_2 \\ \mathbf{B}_1 & \mathbf{B}_2 \end{pmatrix} \\
\mathbf{A}_1 &= (a_{ij})_{1 \leq i, j \leq p}, \mathbf{A}_2 = (a_{ij})_{1 \leq i \leq p, p+1 \leq j \leq 2p} \\
\mathbf{B}_1 &= (a_{ij})_{p+1 \leq i \leq 2p, 1 \leq j \leq p}, \mathbf{B}_2 = (a_{ij})_{p+1 \leq i, j \leq 2p}
\end{aligned} \tag{21}$$

The condition of premium revenue exceeding claim payments in every period is called as net premium condition. In dependent risks modelled with time series assumption, since premium and claim processes are generally unknown, net premium condition is written by using independent and identically distributed error terms. As a result of this, the adjustment coefficient R is obtained by the distribution of error terms. Besides, since error terms are independent and identically distributed random variables, its sufficient to obtain adjustment coefficient with the distribution of first error term (Dağlıoğlu ve Erdemir, 2008b: 149).

Net Premium condition for first order multivariate autoregressive model can be written as follows, when ruin probability for a risk model is considered (Zhang vd., 2007: 34).

$$\mathbf{v}^{-1} \mathbf{E} \left[\sum_{i=1}^p \mathbf{W}_{ik} \right] > \mathbf{E} \left[\sum_{i=1}^p \mathbf{Z}_{ik} \right] \quad k \geq 1 \tag{22}$$

Since distributions of \mathbf{W}_{ik} and \mathbf{Z}_{ik} are generally unknown, net premium condition can be written in terms of \mathbf{V} , which shows independent and identically distributed error terms.

$$(\mathbf{v}^{-1} \mathbf{1}'_p, -\mathbf{1}'_p) \left[\frac{\mathbf{I}_{2p} - \mathbf{A}^k}{\mathbf{I}_{2p} - \mathbf{A}} \begin{pmatrix} \mathbf{E}(\mathbf{X}) \\ \mathbf{E}(\mathbf{Y}) \end{pmatrix} + \mathbf{A}^k \begin{pmatrix} \mathbf{w} \\ \mathbf{z} \end{pmatrix} \right] > 0 \quad k \geq 1 \tag{23}$$

Net Premium condition is sufficient condition if only ruin probability is less than 1. The necessary condition for ruin probabilities less than 1 in first order multivariate autoregressive model is as follows.

$$\mathbf{E} \left[(\mathbf{v}^{-1} \mathbf{1}_p + \mathbf{a})' \mathbf{X} - (\mathbf{1}_p + \mathbf{b})' \mathbf{Y} \right] > 0 \tag{24}$$

\mathbf{a} and \mathbf{b} constant vectors as said before. If the conditions at (24) is granted, \mathbf{A} as being coefficient matrix, r interest rate and F distribution function, $\{\varepsilon_n\}$ process showing independent and identically distributed random variables series described by general distribution function can be expressed as below.

$$\varepsilon_n = (\mathbf{v}^{-1} \mathbf{1}_p + \mathbf{a})' \mathbf{X}_n - (\mathbf{1}_p + \mathbf{b})' \mathbf{Y}_n \tag{25}$$

Here $\mathbf{E}[\varepsilon_n] > 0$. Thus, the adjustment coefficient R , can be obtained by solving following equation.

$$\mathbf{E} \left[e^{(-R \varepsilon_1)} \right] = 1 \tag{26}$$

If there are more than one solution for (26), minimum of these should be chosen as R . As its seen, if there is a positive constant R' , supplying $\mathbf{E} \left[e^{(-R' \varepsilon_1)} \right] \geq 1$, it should be the adjustment coefficient.

3.4. Autoregressive Models Used in Dependent Ruin Probability

Time series are sets of sorted measurements of an amount (Bayramoğlu, 2018: 18). Aim of making analysis with time series is to understand the reality representing by observation set and predicting future values of time series variables correctly.

Autoregressive (AR) processes are the processes showing the relation of time series with their past values. Dependent variable is a function of past values in an autoregressive model. One variable autoregressive model (AR(1)) is shown as follows.

$$x_t = \alpha + \beta x_{(t-1)} + \varepsilon \tag{27}$$

At equation (27), x_t shows the value of x variable at time t , α constant of model, β relation with past period, $x_{(t-1)}$: last period value of x variable and ε error. Time series were first used for premium revenue prediction in actuary science. After

that besides premium, time series was set into motion for claim predictions used in ruin probability. Thanks to these studies, autoregressive models got more importance in actuary studies.

First order autoregressive model used for premium processes in actuarial models is described as follows (Dağlıoğlu and Erdemir, 2008a: 107).

$$W_n = Y_n + bW_{n-1} \quad (28)$$

Here, W_n , shows premium amount collected in period n , W_{n-1} shows Premium amount collected in previous period, and Y_n is the series of independent and identically distributed nonnegative random variables. Parameter b in the model shows the relation of premium amount in period n with previous period and $0 \leq b \leq 1$. While b approaching 1 refers the strong relationship of premium process with past periods, approaching 0 refers a weak relationship.

Claim processes fit first order autoregressive model similarly and is expressed as below.

$$Z_n = X_n + aZ_{n-1} \quad (29)$$

Like premium processes, Z_n shows claim amount paid at period n , Z_{n-1} shows claim amount paid at previous period and X_n is series of independent and identically distributed nonnegative random variables. Here parameter a shows relationship of claim process with past periods and $0 \leq a \leq 1$.

As a result of investigations done in this study, its seen that premium and claim processes can be modelled with first order autoregressive model. Thus, premium and claim processes were tried to be modelled with first order autoregressive model. Besides, multivariate autoregressive model can be described as a multivariate model explained with delayed values of premium and claim variables for each branch and all other variables within the system.

Let (Z_{1n}, Z_{2n}) is the claim paid in the period n , within a portfolio consist of two dependent insurance branches in case of premiums are collected in fixed amounts. Also, let in claim processes $\{(Z_{1n}, Z_{2n})\}$, initial values for every dependent class are like $Z_{10} = z_1$ and $Z_{20} = z_2$. (Z_{1n}, Z_{2n}) claim processes fit two variable autoregressive (AR(1)) time series model as follows (Zhang vd.: 37).

$$\begin{aligned} Z_{1n} &= \alpha_1 Z_{1(n-1)} + \alpha_2 Z_{2(n-1)} + X_n \\ Z_{2n} &= b_1 Z_{1(n-1)} + b_2 Z_{2(n-1)} + Y_n \end{aligned} \quad n \geq 1 \quad (30)$$

Here α_i and b_i are nonnegative constants and $\{(X_n, Y_n)\}$ processes are independent and identically distributed nonnegative random vector processes.

In actuarial models, stationary assumption is needed for consistency and applicability of models along time. Stationary is important in terms of consistency of model. Stationary in time series is the condition of mean and variance of random variable is the same along time. If its multivariate, covariance should be stable.

Stationary condition for any time series which fit two variable autoregressive model like equation (30) is that all roots of λ should be less than 1.

$$h(\lambda) = \begin{vmatrix} \lambda - \alpha_1 & -\alpha_2 \\ -b_1 & \lambda - b_2 \end{vmatrix} = (\lambda - \alpha_1)(\lambda - b_2) - \alpha_2 b_1 = 0 \quad (31)$$

Since α_i and b_i variables at equation (31) are not negative, stationary condition can be expressed as follows:

$$a_1 + b_2 - a_1 b_2 + a_2 b_1 < 1 \quad (32)$$

In dependent risks modelled with time series approach, its said before that adjustment coefficient R can be obtained by the help of distribution of error terms. If error terms of two dependent insurance branches claim amount as Z_{1n} and Z_{2n} which fit two order autoregressive model, respectively $X_n \sim \exp(\alpha)$ and $Y_n \sim \exp(\beta)$ have an exponential distribution, its shown at (33); (Dağlıoğlu and Erdemir, 2008b: 151)

$$E(X_n) = \frac{1}{\alpha} \quad E(Y_n) = \frac{1}{\beta} \quad (33)$$

If error terms of claim processes (ξ_k) are being;

$$\begin{aligned} \xi_k &= [1 + \alpha(v^{-1})]X_k + [1 + \beta(v^{-1})]Y_k \\ &= \frac{[v^{-2} + (b_1 - b_2)v^{-1}]X_k + [v^{-2} - (a_1 - a_2)v^{-1}]Y_k}{h(v^{-1})} \end{aligned} \quad (34)$$

then can be obtained as follows:

$$E(\xi_k) = \frac{[v^{-2} + (b_1 - b_2)v^{-1}]E(X_k) + [v^{-2} - (a_1 - a_2)v^{-1}]E(Y_k)}{h(v^{-1})}$$

$$= \frac{[v^{-2} + (b_1 - b_2)v^{-1}]\frac{1}{\alpha} + [v^{-2} - (a_1 - a_2)v^{-1}]\frac{1}{\beta}}{h(v^{-1})} \quad (35)$$

As being $E(\xi_k) = 1/\lambda$, R adjustment coefficient, can be obtained by solving the equation (36).

$$\exp(Rcv^{-1}) = \frac{\lambda}{\lambda - R} \quad (36)$$

4. DATA AND METHODOLOGY

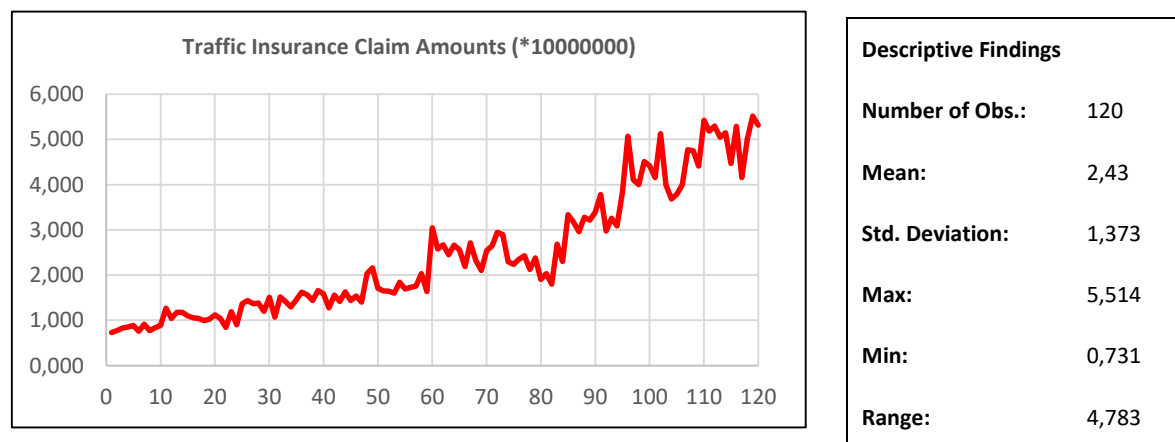
4.1. Used Data Set

In the study, its aimed to calculate ruin probabilities in case of dependency of claim payments for two insurance branches. Simulated data take place in literature generally and calculations are done according to some assumptions. However, in this case it is possible to have difficulties to apply obtained results to the actual observations. In this context, monthly claim data of a leading insurance firm in Turkey which belongs to two different insurance branches namely traffic and health, in the period of 2007-2016 are used. These two branches were chosen according to the expectation of theoretical dependency between them. Analysis were done by simplifying claim amounts with 10.000.000 for the ease of calculation.

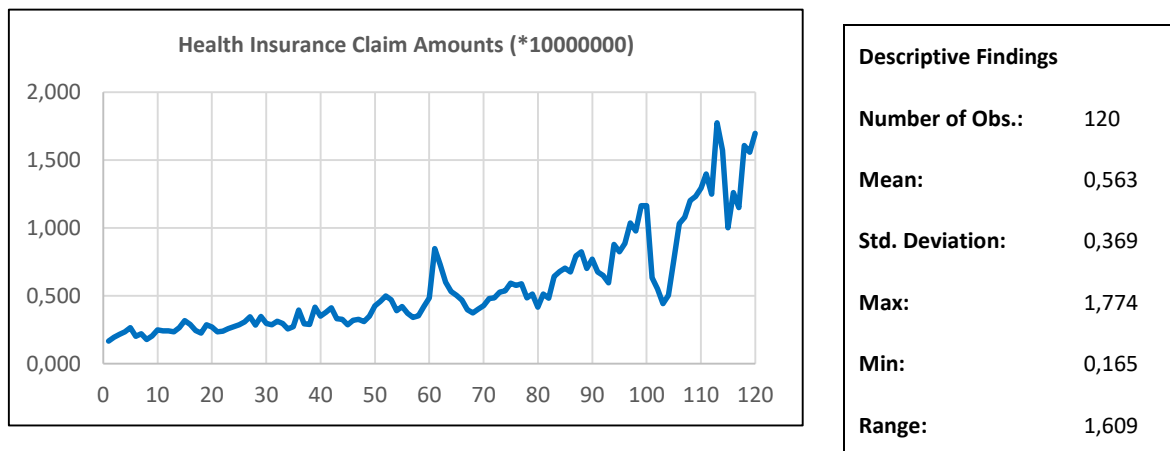
4.2. Descriptive Findings about Insurance Branches

Descriptive findings for paid claim amounts of branches are summarized in Figure 1 and Figure 2.

Figure 1: Descriptive Findings of Traffic Insurance Claim Amounts (TICA)



There are 120 observation value for traffic insurance in the period of 2007 January – 2016 December. It is obviously seen from the graph that there is a rising trend. In that period, monthly average claim payment is 24,3 million TL with a standard deviation of approximately 1,4 million TL. While the biggest claim payment is 55,143 million TL, minimum payment is 47,83 million TL. This shows that the payment range is 47,83 which can be evaluated as a bigger one.

Figure 2: Descriptive Findings for Health Insurance Claim Amounts (HICA)

There are 120 observation value for traffic insurance in the period of 2007 January – 2016 December like traffic insurance. It is obviously seen from the graph that there is a rising trend for this branch too. Only in 2005, there is a serious decrease, but rise continues after that. In the period, monthly average claim payment is 5,63 million TL with a standard deviation of approximately 0,4 million TL. While the biggest claim payment is 17,742 million TL, minimum payment is 1,650 million TL. This shows that the payment range is 16,092 which can be evaluated as a bigger one. Although range of health insurance is not as big as traffic insurance, when we take the amounts paid into account, it can be said that situation is not different from the other one.

In the study, it's thought that traffic and health insurances are dependent. To examine this covariance and correlation coefficients were calculated. As a result of calculation, covariance ($Cov_{TICA, HICA}$) is 46,088. Covariance is significantly different from zero shows that there is a dependency between health and traffic insurances in terms of claim payments. However, since interpreting covariance value is difficult, determining correlation coefficient based on covariance provides stronger comments. (Makridakis, Wheelwright and Hyndman, 1998: 37). Thus, correlation coefficient ($\rho(TICA, HICA)$) was obtained as 0,91. After evaluating covariance and correlation values together, it can be said that there is a strong dependency between paid claim amounts of traffic and health insurances.

There are 120 observations for both insurance branches. For the examination of distributions Minitab 18 was used. Results of TICA and HICA variables' distribution tests were given at the following Table 1.

Table 1: Results of TICA and HICA Variables' Distribution Tests

Distribution	TICA			HICA		
	AD	P	LRT P	AD	P	LRT P
Normal	4,017	<0,005		6,908	<0,005	
Lognormal	1,057	0,009		1,398	<0,005	
3-Parameter Lognormal	0,894	*	0,087	0,307	*	0,000
Exponential	11,161	<0,003		10,865	<0,003	
2-Parameter Exponential	1,078	0,088	0,000	1,247	0,054	0,000
Weibull	2,005	<0,010		3,522	<0,010	
Gamma	1,582	<0,005		2,761	<0,005	
3- Parameter Gamma	0,598	*	0,000	0,989	*	0,000
Logistic	3,479	<0,005		5,157	<0,005	
Loglogistic	1,220	<0,005		1,322	<0,005	
3- Parameter Loglogistic	1,041	*	0,018	0,394	*	0,000

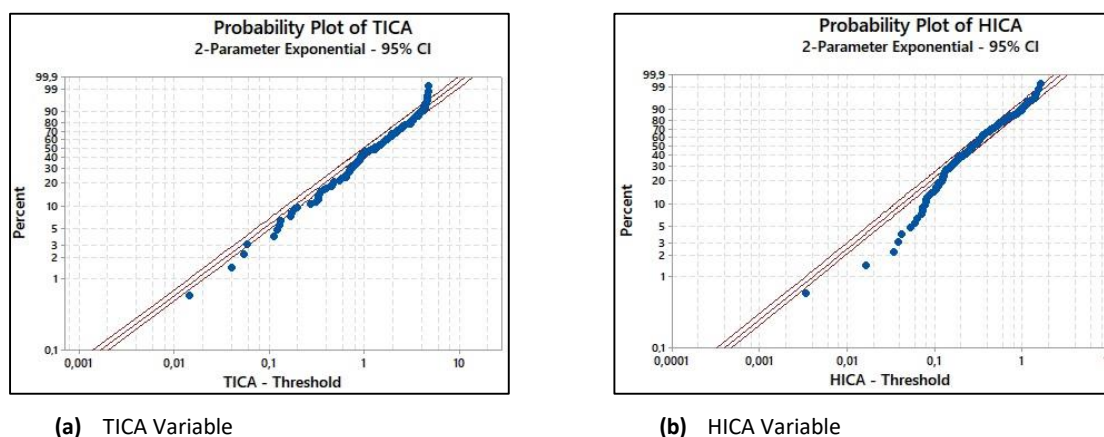
at 0,05 significance level

When we analyze Table 1, its seen that both variables' distributions fit 2-parameter exponential distribution in which p values are more than 0,05. After determining distributions, parameters of distributions were calculated and presented in Table 2.

Table 2: TICA and HICA Variables' Distribution Parameters

Variable	Distribution Parameter (λ)	Threshold Parameter
TICA	1,71340	0,71703
HICA	0,40136	0,16167

There are two parameters for 2-parameter exponential distribution which are λ and threshold parameter. According to results by maximum likelihood (ML) method, for TICA variable $\lambda = 1,7134$ and threshold = 0,71703 and for HICA variable $\lambda = 0,40136$ and threshold = 0,16167. Distribution graphics for both variables are presented in Figure 3.

Figure 3: Graphics of Probability Distribution Tests for TICA and HICA Variables

It can be said that they are located within limits according to threshold values by evaluating graphic and distribution test results and therefore they fit to 2 parameter exponential distribution. It is possible to say that distribution graphics and distribution test results confirm each other.

4.3. Conformity Analysis for Autoregressive Processes

Results of analysis of multivariate autoregressive model which generated by dependency of TICA and HICA variables taken in this study, are presented at Table 5.

Table 3: Results of Autoregressive Model Analysis

	Variable	Coefficient	Std. Error	t-statistic	Prob.
$Z_{TICA(n)}$	TICA(-1)	0.415425	0.059651	13.66982	0.0000
	HICA(-1)	0.311540	0.250369	3.241381	0.0015
R^2		0.913421	Akaike Inf. Criteria (AIC)		5.650771
Adjusted R^2		0.912681	Schwarz Inf. Criteria (SC)		5.697479
$Z_{HICA(n)}$	TICA(-1)	0.034757	0.018395	3.520348	0.0006
	HICA(-1)	0.213325	0.077207	9.627636	0.0000
R^2		0.886381	Akaike Inf. Criteria (AIC)		3.297892
Adjusted R^2		0.885410	Schwarz Inf. Criteria (SC)		3.344600

When analyzing Table 3, results of analysis of determined autoregressive models for both TICA and HICA variables shows that R^2 values are pretty high, also AIC and SC values are seen as sufficient. Accordingly, multivariate autoregressive models for two variables are as follows:

$$Z_{TICA(n)} = 0,42 Z_{TICA(n-1)} + 0,31 Z_{HICA(n-1)} + X_n$$

$$Z_{HICA(n)} = 0,03 Z_{TICA(n-1)} + 0,21 Z_{HICA(n-1)} + X_n$$

Hereunder, TICA depends on previous TICA by % 41,5425 and previous HICA by the rate of % 31,154. On the other hand, HICA is dependent to previous period HICA by % 21,3325 and previous period TICA by % 3,4757.

4.4. Ruin Probabilities

In many studies seen in literature since claim amounts distributions are unknown, calculations were done by error terms of claim amounts. However, in this study theoretical distributions and parameters of these distributions for traffic and health insurances, consisting of 120 observations, were determined. Therefore, instead of distributions of error terms, determined distributions and parameters which belong real observation values, were used.

Within the scope of this study, collected premiums for traffic and health were taken together. In this period, ruin probabilities according to average total premium, minimum total premium and maximum total premium were summarized in Table 4.

Table 4: Ruin Probabilities for Different Total Premiums

Collected Premiums (c)	Fixed Interest Rate (r)	Initial Capital (u) (*10000000)	Stationary Condition (h(λ))	Adjustment Coefficient (R)	Ruin Probability (ϕ)
0,9	0	10	0,4489	0,0062	0,94
2,99	0	10	0,4489	0,015	0,86
7,29	0	10	0,4489	0,192	0,15
10	0	10	0,4489	0,229	0,1

Values in collected premium column were taken as total collected premium of traffic and health insurances in the same period. Obtained minimum total premium amount, average premium amount and maximum total premium were considered. Besides, of set purpose that collected premium were increased along time, ruin probability was calculated in case of collected total premium was 100.000.000 TL in two branches. Fixed interest rate was accepted as 0 and initial capital was assumed stable. Its seen that stationary condition was confirmed by verifying that the values in the column were less than 1. Adjustment coefficient was calculated with MATLAB R2013 by bisection method. It was calculated with nonzero minimum positive value and 0,01 tolerance.

Following the calculations, it was seen that if total collected premium in two branches is 9.000.000 TL, ruin probability is 94%, in case of total collected premium is 29.900.000 TL, ruin probability is %86, in case of total collected premium is 72.900.000 TL, ruin probability is 15% and in case of total collected premium is 10.000.000 TL, ruin probability is 10%.

5. EMPIRICAL RESULTS

In this study, calculation of ruin probabilities in case of two branches of an insurance firm are dependent, was aimed. In many similar studies, data were generated by simulations generally and ruin probabilities were calculated with assumptions. In the scope of this study, actualized real data were used for analysis and results were interpreted. Obtained results are in accordance with similar studies in literature.

On condition that interest rate and initial capital is fixed, its seen that while adjustment coefficient increases, ruin probabilities decrease. To decrease ruin probability, increasing adjustment coefficient R is enough, as mentioned in studies of Wan, Yuen and Li (2005) and Dağlıoğlu and Erdem (2008b). Rise of R is probable with the decrease of dependency between insurance branches. As a result of this decreasing ruin probability can be obtained. However, since dependency of branches taken in the study is extremely high, expecting the decrease in dependency is futile.

Another way to decrease ruin probabilities in case of fixed initial capital and interest rate is to increase collected premiums. If collected premiums can be increased in two branches, since total premiums can exceed claim amounts, ruin probabilities will decrease. When obtained results were evaluated together, in case of total premium is 9.000.000 TL, adjustment coefficient is 0,0062 and ruin probability is 94%. When collected premium is 29.900.000 TL, adjustment coefficient is 0,015 and ruin probability decreases to 86%. In the same way, when collected premium is 72.900.000 TL, adjustment coefficient is 0,192 and ruin probability is 15%. Finally, if collected premium increases to 100.000.000 TL, adjustment coefficient is 0,229 and ruin probability is 10%. To sum up, according to these findings, it can be said that collected premium raises adjustment coefficient and correspondingly reduces ruin probability.

6. CONCLUSION

Since dependency between insurance branches increases ruin probability, studies that diminishing dependency can be supposed, but when current conditions and competition at insurance sector is considered, it is not seen as possible to decrease the dependency. For this reason, it is important for a firm to not to have a depletion in portfolio when taking precautions for customers. Also, total premiums can be increased and with new customers by empowering insurance consciousness, thus ruin probability can be decreased. The conditions which create dependency between branches can be determined by analyzing actual claim payments. In this way, these effects can be separated from each other in policies for both present customers and new customers.

Measuring dependency between existing branches for insurance firms is very important. Calculating ruin probabilities and making risk assessment by considering in what way the dependency is and how strong it is, can be very important guide in decision making for future.

If we think branches as investment portfolio, considering that portfolio risk can be decreased by diversification, then we can make out that increasing diversification in independent branches will decrease ruin probability. Thus, premium that comes to premium pond will increase and risk factor which effects firms' general situation will be decreased.

In this study, 120 actual observation value is taken belonging two insurance branches which are supposed to be dependent. In this context, dependency of more than two branches can be measured and ruin probabilities can be calculated accordingly. For future studies, analysis can be done with more observations by expanding observation span.

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ARE CENTRAL BANK RESERVES AN IMPORTANT INSTRUMENT FOR STABILITY IN EXCHANGE RATES?

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ABSTRACT

Purpose- In developing countries, the most important macroeconomic variable shaping individuals' expectations for economic stability is the nominal exchange rate. For this reason, the first impact of central banks monetary policy implementation results comes out at nominal exchange rate. In this study, the relationship between the nominal exchange rate and the gross foreign exchange reserves of the central bank has been investigated.

Methodology- In this study, Dickey-Fuller (1981, ADF) and Phillips-Perron (1988, PP) unit root tests, asymmetrical causality test and lastly Bootstrap Rolling Window Causality tests developed by Balcilar et al. (2010) have been used.

Findings- There is a causal relationship between the nominal exchange rate and central bank reserves. Central bank interfere in nominal exchange rate with its reserves rather than interest policy.

Conclusion- As a result of the empirical analysis, causality has been found from positive shocks coming to nominal exchange rates to positive shocks in central bank gross foreign exchange reserves and from positive shocks formed in central bank gross foreign exchange reserves to negative shocks coming in nominal exchange rate.

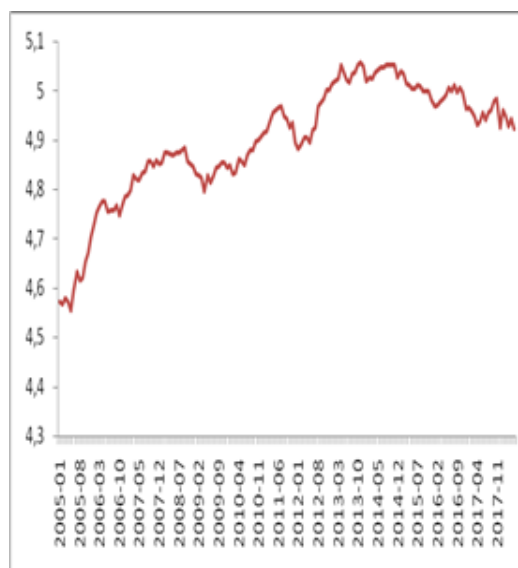
Keywords: Exchange rates, central banking, causality, asymmetric causality, bootstrap rolling window causalityç

JEL Codes: E58, F31, F41

1. INTRODUCTION

In the economic literature, the most important variable in macroeconomic indicators is the exchange rate. The exchange rate variable appears in many economic policies such as the monetary condition index, the Taylor rule, transmission mechanisms the exchange rate transition effect. For this reason, it is important for policymakers to put forward the determinants of exchange rate. The fluctuations in nominal exchange rates shape the expectations of households towards economic course. According to Calvo and Reinhart (2002), central banks save substantial amount of reserve in order to prevent the fluctuaitons in nominal exchange rate. However, these reserves that central banks save effect resource allocation in financial markets. In this study, it was investigated whether the central banks are effective in influencing the nominal exchange rate. With the causality between shocks used in study and causality tests based on Rolling Window Regression, it is aimed to complete an important deficiency in the empirical literature.

In the Turkey economy, important economical events have occured in the last 30 years. With the 1994, 1999, 2000 and 2001 crises, important fluctuations have occurred in nominal exchange rate and the economic expectations of household were spoiled substantially. During this period, the central bank applied adjustable fixed exchange rate, controllable floating exchange rate and finally floating exchange rate policies respectively. Since 2003, central bank has carried out floating exchange rate regime and inflation-targeting regime together. With the inflation-targeting regime, the central bank's basic target has been price stability. With the aim of limiting the exchange rate transition effect, it has struggled to stabilize the nominal exchange rate. For this purpose, it has used alternative monetary policy means and the reserves has been one of them.

Graphic 1: Development of Nominal Foreign Exchange Rate by Years**Graphic 2: Development of Central Bank Gross Foreign Exchange Reserves by Years**

Looking at nominal exchange rates over the years, a significant upward trend is seen. Central bank reserves have maintained the upward trend but they have experienced fluctuations. It decreased between 2008-2009 and 2011-2012. When the rise in nominal exchange rate on the same dates is considered, it is seen that at least visually central bank reserves have not been used. In the empirical literature, there are many studies investigating the exchange rate and reserve relation in Turkey's economy. Balaylar and Ural (2007), Kibritçioğlu (2001), Alper and Ardic (2006), Balaylar (2011) and Parlaktuna (2005) suggested that central bank reserves should be used for sterilisation in the exchange market. While Bayat et al. (2014) found that central bank reserves does not affect the exchange rate, Kasman and Ayhan (2008) found causality from the nominal exchange rate to the central bank reserves.

2. DATA AND METHODOLOGY

In this study, the nominal exchange rate that belongs to the period between January 2005 and May 2018 in Turkey the relationship between (NEER) and the central bank gross exchange reserves (RES) has been investigated. Datas have been obtained from Central Bank of the Turkish Republic Electronic Data Distribution System. While the relationship between variables has been investigated, current developments in time-series analysis have been utilized. In this context, linear unit root tests that not considering the structural breaks developed by Dickey-Fuller (1981, ADF) and Phillips-Perron (1988, PP), asymmetrical causality test and lastly Bootstrap Rolling Window Causality tests developed by Balcilar et al. (2010) have been used.

The equations based on the ADF unit root test can be written as follows (Sevüktekin ve Nargeleçekenler, 2007:321).

$$\Delta Y_t = \delta Y_{t-1} + \sum_{r=1}^f \delta r \Delta Y_{t-r} + \varepsilon_t \quad (2.1.)$$

$$\Delta Y_t = \mu + \delta Y_{t-1} + \sum_{r=1}^f \delta r \Delta Y_{t-r} + \varepsilon_t \quad (2.2.)$$

$$\Delta Y_t = \mu + \beta_t + \delta Y_{t-1} + \sum_{r=1}^f \delta r \Delta Y_{t-r} + \varepsilon_t \quad (2.3.)$$

The ADF unit root test assumes that the shocks have an independent and constant variance (Sevüktekin ve Nargeleçekenler, 2007:363). Phillips-Perron developed an alternative unit root test to resolve this deficiency. Phillips-Perron is based on the following test (Phillips ve Perron, 1988:341)

$$Z_{\bar{\varphi}} = T(\bar{\varphi} - 1) - \frac{1}{2}(\bar{\sigma}_{T\ell}^2 - \bar{\sigma}^2) \left[T^{-2} \sum_{t=1}^T y_{t-1}^2 \right]^{-1} \quad (2.4.)$$

$$Z(t_{\bar{\varphi}}) = (\bar{\sigma} / \bar{\sigma}_{\varepsilon}) t_{\bar{\varphi}} - \frac{1}{2}(\bar{\sigma}_{T\ell}^2 - \bar{\sigma}^2) \left[(T^{-2} \sum_{t=1}^T \varepsilon_{t-1}^2)^{1/2} \right]^{-1} \quad (2.5.)$$

In the Hatemi J-Roca causality test, the causality of positive and negative shocks is investigated. The following model is used in Hatemi J-Roca granger causality test (Acci, 2015:73).

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{10} + \sum_{i=1}^t \varepsilon_{1i}^+ + \sum_{i=1}^t \varepsilon_{1i}^- \quad (2.6.)$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{20} + \sum_{i=1}^t \varepsilon_{2i}^+ + \sum_{i=1}^t \varepsilon_{2i}^- \quad (2.7.)$$

Using bootstrap rolling window approach, it was analysed the time-varying causal links between nominal exchange rate and central bank reserve. Balcilar et al. (2010) bootstrap rolling window causality test uses residual-based bootstrap technique based corrected-LR tests in order to investigate the causal nexus between nominal exchange rate and central bank reserve (Balcilar et al, 2010:1400).

In the Balcilar et al(2010) bootstrap Rolling window causality test, it was used bootstrap version of Toda and Yamamoto (1995) causality tests due to several advantages it possesses (Balcilar et al, 2010:1400).

3. EMPIRICAL RESULTS

When the coefficient of correlation is examined, it is seen that there is a positive relation between two variable. While the model is being formed, in order to see the dynamic relations between variables, vector auto regression (VAR) model will be installed. As discussed in the VAR model methodology, it is necessary to find the levels that variables are stable. For this purpose, linear unit root tests that not considering the structural breaks developed by Dickey-Fuller (1981, ADF) and Phillips-Perron (1988, PP) will be carried out in econometric literature.

Table 1: Correlations between Variables

	NEER	RES
NEER	1	-
RES	0.533	1

Table 2: ADF (1981) and PP (1988) Unit Root Test Result

	Variables	ADF	PP		Variables	ADF	PP
Intercept	NEER	2.709 (2) [0.997]	3.026 (6) [0.998]	1st Difference	NEER	-7.561 (1) [0.00]***	-7.023 (5) [0.00]***
	RES	-2.337 (0) [0.161]	-2.321 (4) [0.166]		RES	-13.261 (0) [0.00]***	-13.293 (5) [0.00]***
Intercept+Trend	NEER	0.346 (2) [0.998]	0.355 (6) [0.998]		NEER	-8.227 (1) [0.00]***	-7.146 (8) [0.00]***
	RES	-1.097 (0) [0.925]	-1.156 (4) [0.915]		RES	-13.619 (0) [0.00]***	-13.581 (4) [0.00]***

Note: ***, ** and * values show the stationarity of the series in %1, %5 and %10 significance levels respectively. According to Schwarz information criteria, the values in bracket show optimal lag length. The values in square bracket show probability values. For ADF test: Mac Kinnon (1996) critical values 1 % fixed. For 5 % and 10 % values 3.485, -2.885, -2.579 respectively and for fixed + trend 1 %. For 5 % and 10 % probability values -3.483, -2.884, -2.579 respectively. For PP test: Mac Kinnon (1996) critical values 1 % fixed. For 5 % and 10 % values 3.485, -2.885, -2.579 respectively and for fixed + trend 1 %. For 5 % and 10 % probability values -4.033, -3.446 and -3.148 respectively.

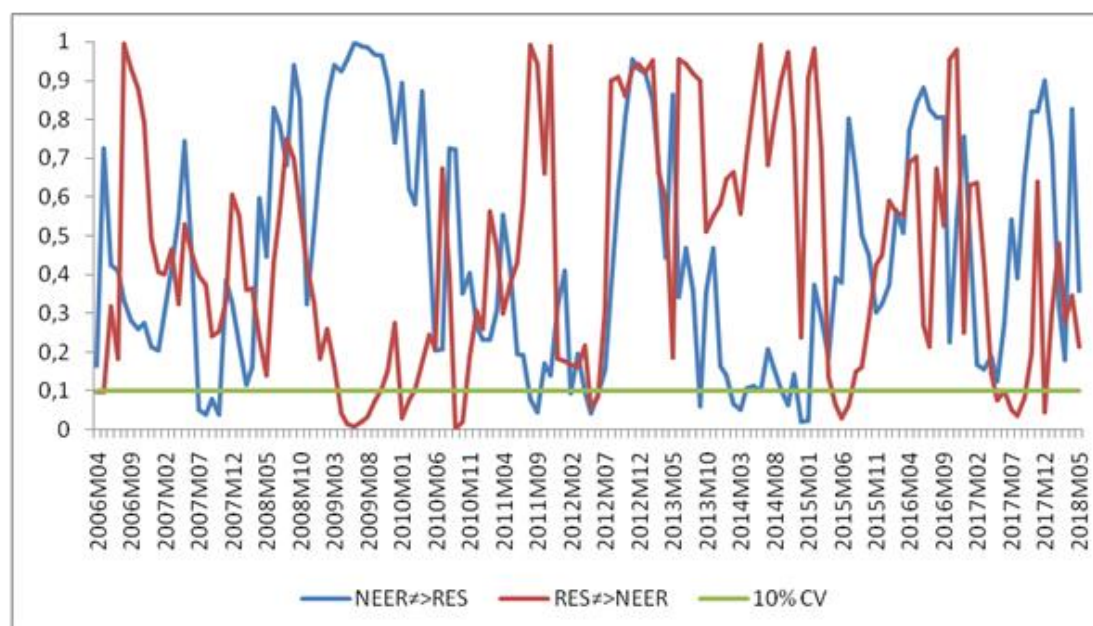
It is seen that both nominal exchange rate and central bank gross exchange reserves have unit root in level values. However, when the first difference of the variables is taken, it appears to be stationary. For Hatemi J and Roca (2014) causality test and Balçilar et al. (2010) bootstrap rolling window, obtained from the vector auto regression model, optimal lag length has been set to 3. In order to see the asymmetrical relations between variables, causality test developed by Hatemi and Roca (2014) has been implemented.

Table 3: Hatemi J-Roca (2014) Asymmetric Causality Test Results

Direction of Causality	MWALD	%1 Bootsrap CV	%5 Bootsrap CV	%10 Bootsrap CV
(NEER) ⁺ ≠> (RES) ⁺	4.739 (0.094)*	9.609	6.279	4.807
(NEER) ⁺ ≠> (RES) ⁻	0.316 (0.574)	7.045	4.060	3.045
(NEER) ⁻ ≠> (RES) ⁻	0.370 (0.543)	6.711	3.652	2.685
(NEER) ⁻ ≠> (RES) ⁺	1.053 (0.305)	7.078	4.103	2.974
(RES) ⁺ ≠> (NEER) ⁺	0.240 (0.887)	9.481	6.537	4.596
(RES) ⁺ ≠> (NEER) ⁻	7.424 (0.00)***	7.253***	3.816**	2.590*
(RES) ⁻ ≠> (NEER) ⁻	1.268 (0.260)	8.194	4.191	2.866
(RES) ⁻ ≠> (NEER) ⁺	3.421 (0.064)*	6.936	4.020	2.770*

Note: ≠> The notation shows null hypothesis that does not have causality. The values in bracket indicate probability values asymptotically. ***, ** and * values show causality relation between variables at significance levels of 1% 5% and 10% respectively. The Bootstrap number is 10.000.

Hatemi J-Roca (2014) asymmetrical causality test's null hypothesis states that there is no causality from nominal exchange rate to central bank reserves. The alternative hypothesis remarks that there is causality from nominal exchange rate to central bank reserves. Two different test statistics are applied in the decision phase. Initially, the values in bracket indicate the probability values distributed asymptotically. If the probability values in bracket are below the %1 (0.01), %5 (0.05) and %10 (0.1) significance levels, the alternative hypothesis that there is causality from nominal exchange rate to central bank reserves is accepted. On the other hand, If MWALD test statistics are over the bootstrap critical values that are calculated for significance levels, the alternative hypothesis is accepted again. Accordingly, the positive shocks that come to nominal exchange rate (rising of nominal exchange rate) cause positive shocks in central bank exchange rate (rising of reserves) at 10% significance level asymptotically. The positive shocks in central bank gross exchange rate (rising of reserves) cause negative shocks that come at nominal exchange rate. On the contrary, negative shocks at central bank gross exchange rate (decrease of reserves) cause positive shocks that comes at nominal exchange rate at 10% significance level asymptotically. According to Bayat et al (2015) the central bank considers nominal exchange rate's mobility rather than it's value. Because, in developing countries, nominal exchange rate shapes economic actors' expectations for economic stability. At times when the mobility in nominal exchange rate rises, individuals worry about economic course. According to Koçyiğit et al (2013), central banks want to control the deviations at equilibrium price of exchange rate in order to control inflation. Therefore, they presume that exchange rate will act as a nominal anchor in controlling inflation. With a sterilized exchange rate intervention, its effect on inflation will be minimized with the exchange rate transition effect.

Graphic 3: Bootstrap Rolling Window Causality Test Results (Balcilar et al. (2010))

The hypothesis in Balcilar et al.(2010) bootstrap Rolling window causality test are the same as Hatemi J-Roca (2014) asymmetric causality test too. The test's null hypothesis indicates that there is no causality from nominal exchange rate to central bank reserves. The alternative hypothesis remarks that there is causality from nominal exchange rate to central bank reserves. In the decision period, probability values are used again. If probability values are below %1 (0.01), %5 (0.05) and %10 (0.1), the alternative hypothesis, which argues that there is causality from nominal exchange rate to central bank reserves in that month, is accepted. According to this, from exchange rate to central bank gross exchange reserves, there is causality on the dates of on July, August, September and October 2007, August and September 2011, February, April, May and June 2012, September 2013, February, March, June, October, December 2014 and January 2015. From central bank gross exchange reserves to nominal exchange rate, there is causality in the months of April and May 2006, April, May, June, July, August and September 2009, January, February, September and October 2010, May and June 2012, May, June and July 2015, July and December 2017. Kar et al. (2016) the first asymmetric effects in exchange rate arise in the money supply. This effect affects the central bank's purpose of stabilization of currency firstly. On these dates, low interests that emerge due to central bank's increases in money supply lead to the exit of foreign capital. The reserve declines that show up in Graphic 2 show that central bank interfere in nominal exchange rate with its reserves rather than interest policy.

4. CONCLUSION

In this study, the relation between nominal exchange rate and central bank reserves in Turkey's economy between January 2005-May 2018 has been studied. Current developments in the time series method have been utilized in the study. In the empirical analysis, firstly a positive and in the middle relationship between the variables has been found. In the sequential unit root test not considering the structural breaks developed by Dickey-Fuller (1981, ADF) and Phillips-Perron (1988, PP), it has been concluded that it has unit root in level values parallel to the economic crisis experienced in Turkey's economy and when the first difference is taken, it has been concluded that the variables are stable (purified from economic shocks). In the Hatemi J and Roca (2014) asymmetrical test, it has been determined causality relation from positive shocks that come to nominal exchange rate towards positive shocks in central bank gross exchange reserves and from positive shocks in central bank gross exchange reserves towards negative shocks coming in nominal exchange rate. Additionally, it has been found causality from negative shocks in central bank gross exchange reserves towards positive shocks coming in nominal exchange rate. In the Balcilar et al. (2010) bootstrap rolling window causality test, it is seen that there is causality relation on different dates for 17 months, from nominal exchange rate to central bank gross exchange reserves, for 19 months from central bank gross exchange reserves to nominal exchange rate. When the results are considered as a whole, the source of causality that comes out for 17 months from nominal exchange rate that emerges in Balcilar et al. (2010) bootstrap rolling window causality test towards central bank gross exchange reserves, is the interaction of positive shocks that come to nominal exchange rate and positive shocks in central bank gross exchange reserves. The source of causality that comes out

for 19 months from central bank gross exchange reserves to nominal exchange rate is the interaction of positive shocks in central bank gross exchange reserves and negative shocks in nominal gross exchange rate.

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