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STUDIA UNIVERSITATIS BABEȘ-BOLYAI OECONOMICA
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THE IMPORTANCE OF SUPPLIER EVALUATION IN SHORT SUPPLY CHAINS

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Abstract
The consideration of supply chains can foster the viability and maintainability of local producers. The formation and retention of the market may be complicated for local producers; therefore it is advisable to take the creation of supply chains into consideration. Constant feedback and evaluation is highly important to maintain successfully operating short supply chains and supplier evaluation forms could act as the starting point of these chains. These forms reflect the strengths and weaknesses of suppliers, based on which the correction of mistakes can be done and the performance of suppliers may be enhanced. The aim of this study is to examine the role of supplier evaluation form and relationships between customers and suppliers in short supply chains, from a local producer's point of view through a case study. The scientific relevance of this study is to draw particular attention to short supply chains which are and will be of high importance considering local economies. As the case study reveals, it is recommended for the members of short supply chains to use supplier evaluation forms.

JEL classification: Q31;

Keywords: short supply chain, supplier evaluation form, supplier, case study.

1. Introduction

The aim of supply chain management is the satisfaction of consumer needs and the integration of all parties and processes involved in a given supply chain into a unified system. Both the internal and external relationships of organizations are of high importance (Szegedi- Prezenszki 2012, pp.367-368). Creating and acting in short supply chains can foster viability and maintainability in case of local producers as well. In order to maintain a benefical supply chain, it is crucial to manage the relationship between customers and suppliers continously. Constant evaluation and effective communication is one of the basis of well-operating supply chains, therefore the use of supplier evaluation form should be

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taken into consideration. These forms provide beneficial information to customers and producers, furthermore it fosters the appropriate communication and collaboration between the parties.

The objective of this research is to examine local products' short supply chains with particular regard to the application of supplier evaluation forms and customer-supplier relationships between the members. In this study the importance of supplier evaluation is discussed from a local producer's point of view acting in a short supply chain. The main contribution is to draw attention to the application of supplier evaluation forms and to the importance of beneficial customer-supplier relationships in short supply chains.

Firstly, the literature on the two main factors of this research is summarized based on some articles: short supply chains and supplier evaluation forms. In the second part, the case study of a local producer is presented.

2. Short supply chains

A supply chain involves at least two or more legally separated organizations, connected by material, financial and information flows. The three most decisive participants are: manufacturers, suppliers and consumers (Jarzebowski et. al, 2017, p.197). There exist several different definitions of short supply chains, but they share a common characteristic: reduced number of intermediaries between the producer and the consumer.

2.1. Definition of short supply chains

According to Peters (2012), the criteria for short supply chains are the number of intermediaries and physical distance: 'short supply chains are not only focused on the distance between production and sale of product, but also the number of links in the food supply chain, with the goal being to reduce this as much as possible'. The European Rural Development Regulation (1305/2013) defines the short supply chain as: 'a supply chain involving limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between producers, processors and consumers'. This definition highlights the social relations and economic development as well. Ilbery and Maye (2005) state that: ' the direct relationship between the producer and the consumer involves construction of knowledge, value and meaning about the product and it provenance, production and consumption, the producer and the consumer themselves, rather than solely an exchange of a product. These two authors focus on knowledge exchange besides social relations.

Summarizing the definitions the most important criteria of short supply chains are: reduced number of intermediaries, physical proximity, importance of social relations and cooperation, and rural economic development.

2.2. Classification of short supply chains

There are several classifications for short supply chains, but the most widespread is the classsification by Renting and his co-authors. Renting et. al

(2003) differentiate three main types of short supply chains based on the number of intermediaries and physical distance. The first type is the *Face-to-face short supply chain* meaning that the local producer sells the product directly to the final consumer without any intermediaries. The second category is the *Proximate short supply chain* the sale of products is made locally, in a specific region. In this context one intermediary appears in the short supply chain (e.g. local shops, service providers, public institutions). The last type is the *Spatially extended short supply chain* – products are sold not only locally but in different regions as well. In this case consumers may have no experience with origin of the region.

3. Supplier evaluation form

The purchase decisions of organizations highly influence the economic performance of corporations. The prime cost represents a large part of total cost, therefore the evaluation of the most appropriate suppliers should be based on this issue and with respect to good quality. Organizations which are able to manage suppliers efficiently can be successful on the long-term.

3.1. The aim of supplier evaluation form

The basic requirement of procurement is to meet the expectations of organizational strategy. Suppliers can contribute to the competitiveness of companies. The main element of supplier relationships is the accurate and purposeful evaluation of suppliers. Two major factors should be considered with regard to the evaluation: aims and weight points (Körmendi-Pucsek, 2008, p.61).

Three different aims of the supplier evaluation form can be stated: (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61): the evaluation of the best supplier possible; the enhancement of the suppliers' performance; controlling the relationship with suppliers.

The evaluation of the best supplier possible

Organizations aim to have the most competent suppliers possible, in order to operate effectively in the market, in which the communication plays very important role (Szabó-Szentgróti-Gelencsér-Szabó-Szentgróti -Berke, 2019). In addition to this, the engagement and the high level of proficiency are must-have characteristics considering suppliers (Jin-Vidyaranya, 2016, p.169). If the company determines to procure a new product/service or to dismiss a supplier, it has to seek for other suppliers. If there is an opportunity to elect from many suppliers, the goal is to find the best supplier possible. This can not be decided easily, therefore many aspects have to be determined during the evaluation. The organization has to define the most crucial criteria, which have to be weighted. These aspects are detailed later in this study (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

The enhancement of the suppliers' performance

Supplier evaluation forms enable the analysis of the strenghts and weaknesses of suppliers. The success of organizations depends on the performance of suppliers, thus it is beneficial to companies to help suppliers. Aims and expectations

of organizations could boost the performance of suppliers (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

Controlling the relationship with suppliers

Mapping of the suppliers is necessary in order to predict the future of partnership. Acquired information may be favorable in case of bargaining or when making suppliers compete each other (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

3.2. Customer-supplier relationship

Deciding how to manage suppliers is a key-question concerning customer-supplier relationships. In order to operate a business successfully and efficiently, managing customer-supplier relationship is of high importance. There are two main models representing customer-supplier relationships:

- Opponent/competition model by conventional approach:

Customers elect suppliers based on price, therefor they make suppliers compete against each other to reach the price suitable for the customers. This approach treats suppliers as opponents (Chikán-Demeter, 1999, p.443).

- A collaborative model according to the state-of-the-art approach:

This model puts emphasis on collaboration between partners. It is adviseable to maintain the number of suppliers at the lowest level possible and to develop a partnership based on collaborition with these suppliers. This can enhance the competitiveness of the organization (Chikán-Demeter, 1999, p.443). Salam and Khan state that, many customer-supplier relationships follow the partnership approach. This means closer contracts, shared strategies, long-term perspective and shared information resulting in a higher level of integration. It is important to enhance the engagement of suppliers in order maintain a mutually beneficial long-term relationship (Salam-Khan, 2018 p.4088).

In case of the competition model, trust is not evolved between the partners. However trust is the basis of the other model, partners aim to maintain a mutually beneficial relationship by solving problems arised. Organizations can enquire other companies about the reliability of a given supplier. Supplier evaluation forms could also help organizations if they had been working with the supplier before (Pató-Kopácsi-Kreiner, 2017, pp. 499, 503, 507).

Fehr and Rocha (2018) state based on their and previous researches, that the main elements of a mutually beneficial and economically successful customer-supplier relationship are trust and continous information sharing (Fehr-Rocha, 2018, p.598). This statement enhances the application of supplier evaluation forms and communation which is very important in sale of local food (Dajnoki – Szabados – Kulcsár – Bácsné Bába, 2018).

3.3. Criteria of the supplier evaluation form

One or more criteria of the supplier evaluation form are needed to be determined, because these aspects can act as a basis when making decisions about suppliers. These criteria can differ from an organization to another. In 1966 Dickson publicized a study (Dickson, 1966 in Esse, 2012, p.8), in which 273

purchasing agent and manager defined the most important criteria about suppliers. Based on the results, 23 criteria were ranked by Dickson. His study also points out the importance of taking more criteria into consideration (Esse, 2012, p. 8). A recent research shows that the most important evaluation factors are quality, supplier certification, facilities, continuous improvement, physical distribution and channel relationship (Hwang et. al, 2016).

Table 1. Ranking of the 23 criteria

Ordinal	Criteria	Mark	Evaluation
1	Quality	3,508	Highly important
2	Transport	3,417	Essential
3	Former performance	2,998	
4	Guarantee	2,849	
5	Production facility and capacity	2,775	
6	Price	2,758	
7	Technological ability	2,545	
8	Financial status (Csiszárik, 2017. pp.75-87.)	2,514	
9	Consistent procedures	2,488	Average importance
10	Communication system	2,426	
11	Repute and position in industry	2,412	
12	Desire to sign contracts	2,256	
13	Management and organization	2,216	
14	Operational control	2,212	
15	Repair service	2,187	
16	Attitude, behaviour	2,120	
17	Impression	2,054	
18	Packaging ability	2,009	
19	Labour	2,003	
20	Location	1,872	
21	Number of businesses so far	1,597	
22	Help in training	1,537	
23	Mutual settlement, agreement	0,610	Trivial

(Source: Esse, 2012, p.8)

3.4. Types of supplier evaluation forms

Supplier evaluation is an important feature of procurement. In scientific literature, several different types are defined. Szegedi-Prezenszki (Szegedi-Prezenszki, 2005, p. 92) differentiated 3 distinct categories:

- **Simple, categorical method:** The buying department determines the criteria to which the values are assigned. In general, 3-7 value categories are used in practice, in order to make the model managable. This method is advantageous due to the low costs and simplicity. On the other hand, there are no numerical data involved supporting the details, therefore categories should be regularly supervised (Szegedi-Prezenszki, 2005, p. 92). In case of short supply chains this method can be useful.

The supplier evaluation form represented in Figure 1 is based on this method.

Figure 1. Sample for simple supplier evaluation form

Supplier Evaluation Form			
Name of supplier:			
Address of supplier:			
Code of supplier:			
Phone number:			
Date of supply:			
Name of supplied product:			
Number of products:			
Characteristics	Qualification		
	Low	Adequate	Excellent
Price		X	
Number of defective products			X
Number of damaged products due to transportation		X	
Accurcy of transportation			X
Payment terms	X		
Safety of packaging		X	

(Source: Szegedi-Prezenszki, 2005, p.93)

- **Cost-based supplier performance evaluation:** Costs are represented and examined in the ratio of prime costs. Ratios are defined based on different cost categories and the performance of suppliers is compared on the basis of these ratios. The advantage of this method is the simple comparison of suppliers. However it is disadvantageous, because it requires a huge amount of information and time (Szegedi-Prezenszki, 2005, p.93).
- **Complex evaluation/assessment procedures:** Several methods belong to this category, but the common characteristic is the application of numerical data. Weighted factors are ordered to the most important factors of procurement. On the basis of the calculated results, suppliers are classified into 4 groups:
  - ***'Category A' Supplier:*** delivery can be done without any restrictions
  - ***'Category B' Supplier:*** delivery can be done without any restrictions, but periodical supervision of incoming products are advised
  - ***'Category C' Supplier:*** delivery can be done with restrictions, but supervision of incoming products is done by regular sampling
  - ***'Category D' Supplier:*** delivery should only be done in the last resort with the permission of the general manager. Quality of incoming products is not guaranteed; therefore all products should be supervised.

This method is relatively easy to understand, but it is quite time-consuming and some of the data are not numerical. (Szegedi-Prezenszki, 2005, p.94-96)
Defining the accurate expectations, gathering and analysing data are of high importance when creating a supplier evaluation form. If this work is not done with a sufficient degree of accuracy, suppliers probably lack the needed information in order to meet the desired requirements. Lack of information can also prevent suppliers from enhancing their performance. Supplier evaluation forms may represnt problems, which are overlooked by suppliers, thus supporting the development of performance (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2016, p.256).

4. Case study of CSIKOS jam family

In this section, the aim and the method of this study, the description of the CSIKOS jam family and the answers to the research questions can be read.

4.1. The description and the method of this reaserch

The aim of this case study detailed below is to represent the role of supplier evaluation form and the relationships between partners in short supply chains from the aspect of a local producer through a case study.
This study is an exploratory research, therefore there is no hypothesis.
The research questions are the following:

- Which is the role of the supplier evaluation forms in short supply chains?
- What are the characteristics of customer-supplier relationships in short supply chains?

The scientific relevance of this study is to draw attention to short supply chains, which significantly define the livelihood of local producers and customers as well. Thinking and operating in short supply chains means an economic philosophy based on outstanding quality and mutual trust. The aim is to represent the importance of effective short supply chains in local economies.

The local producer of the case study is well-known in his local region. It is significant to represent a best practice from which other local producers can collect ideas and develop their activities.

4.2. The CSIKOS jam family and the supplier evaluation form

The owner of this jam family manufactures his trademarked products by his owns hands. Today the jams are present in more than 30 shops in the country, including some restaurants as well. These jams are produced in several different flavours, there are jams created specifically to women and some expressly to men. The favourites of women are for example the jam which tastes like the gerbeauds cake and the one made with basil, green tea and raspberry. On the other hand lots of men appreciate the marmalade flavoured with Belgian chocolate and sour cherry.

In short supply chains there are no or only a few intermediate actors between suppliers and final customers, this is true for this case as well. The owner of the jam family sells approximately half of his products directly to end customers. The other half of the products are sold by approximately 30 different intermediate actors (e.g. shops and restaurants). In the second case, it is highly important to cooperate and communicate well with partners in order to maintain a mutually beneficial relationship.

As a supplier, the owner of the jam family, has not received any formal supplier evaluation form from its customers. However, verbal evaluation of the supplier is common between the partners. Most of the customers highlight the unique taste of the jams, the size of the jar and the modern design of the labels. The owner considers formal supplier evaluation highly important, therefore he looked for a solution. At least one special supplier evaluation form per year, composed by him, is sent to customers. According to his experiences, 2-3 evaluations per year are considered to be optimal. He claims: The more feedback is made, the more successful the relationship is between partners. His supplier evaluation form contains some major

questions and some questions are based on the S+S+C (Start+Stop+Continue method). This method reveals which of his activities connected to his products should be continued (Continue), removed (Stop) or developed (Start) (based on www.retrium.com/resources/techniques/start-stop-continue).This kind of evaluation contributes to the development of partnerships, by revealing problems. Furthermore it can be seen, if anything new should be introduced. The owner of the jam family states that the use of the written supplier evaluation form contributes to the maintenance of mutually beneficial relationships with the customers. The filled supplier evaluation forms represent the strenghs and weaknesses of the supplier, based on which the supplier can find solutions to appearing deficiency. The supplier can totalize the strenghs and weaknesses, for example some customers suggested to change the size of the jams, which results that these forms can also contribute to product development. Besides that, suppliers can recognize the needs of customers and decide if they can or would like to satisfy them or not. The use of this supplier evaluation form is beneficial to customers as well, because all their expectations and recommendations can be easily stated, and it is communicated to them, that their oppinions matter to the supplier. The owner claims that the use of written supplier evaluation form is the basis of developing and maintaining proper cooperation and communication with the partners. As a supplier his relationship with the customers became much better after the use of his written evaluation form. This proves the fact that constant communication and evaluation is needed to develop and maintain a successfully operating short supply chain.

The comparison of a 'regular' supplier evaluation form and the CSIKOS supplier evaluation form is made in order to represent these two possibilities to the member of short supply chains who may plan to use written supplier evaluation form. When comparing the supplier evaluation form shown in Figure 1 with the CSIKOS supplier evaluation form, several similarities and differences can be determined. Both forms contain the most important general criteria such as price, quality, packaging and logistical questions. The supplier evaluation in Figure 1 is shorter and is based on a simple, categorical method. The company has to decide which criteria are of high importance, then the evaluation of the supplier according to these criteria is made. The CSIKOS supplier evaluation form is more detailed and it also consists of sentencial evaluation. The S+S+C method is used in case of questions about the products and logistics. In this form a special section is about marketing. The owner asks the the customers if they need any help in marketing (e.g. leaflet, molino), or are they satisfied with the frequency and form of communication (e.g. newsletter, Facebook).

Table 2. Comparison of supplier evaluation forms

Supplier evaluation form (Figure 1)	**CSIKOS supplier evaluation form**
- the most important general criteria (pl. price, quality etc.) - short - simple, categorical method	- the most important general criteria (pl. price, quality etc.) - more detailed - sentencial evaluation - S+S+C method - highlight of marketing

(Source: Own construction)

4.3. Supplier-customer collaboration in case of the CSIKOS jam family

According to the owner, trust is the basis of any appropriate partnerships. Communication between the partners and constant feedback are both of high importance. These can contribute to finding solutions to arising problems.

Not only customers can evaluate suppliers, but suppliers may rate customers as well based on the quality of collaboration. In our case, the owner has already made some evaluation of customers, in which he rated partners based on how successful the collaboration and the communication is. The aim of this process is to eliminate partnerships which are not beneficial for the supplier. There are some customers with whom many conflicts arise and some has too high expectations. Suppliers have to consider if a partnership is profitable or not. On the other hand, he devotes more time and attention to those customers who has good ranking after the evaluation.

The owner of the CSIKOS jam family puts emphasis on his marketing activity, according to him it is highly important in order to be a successful local producer. To those customers who accept it, he sends tasting packages so that consumers can get to know his products better. A product guide is attached to each package including a detailed explanation of all jams, supporting the work of the shop assistants. Joint marketing activity could increase the number of sold products and it can also deepen the collaboration between the partners.

5. Conclusions

Short supply chains are more and more determinative considering local economies. The fulfilment of high quality expectations enables the sale of local products. Suppliers have to cooperate with other members of the short supply chain in order to react proactively to changing consumer demand. The use of supplier evaluation form - such as the example mentioned previously - can be the basic element of communication. In the short supply chains of local products, the application of written supplier evaluation is not typical. However verbal feedback is common between customers and suppliers. As the case study proves, constant written evaluation besides verbal communication contributes to maintaining a mutually beneficial partnership between suppliers and customers. Therefore the application of written supplier evaluation forms in short supply chains is highly advised. Based on supplier evaluation, suppliers can recognize their strengths and weaknesses, furthermore arising problems can be easilier solved. The evaluation can support product development and logistical aspects (e.g. size of the product, package) as well. In a given short supply chain, it is highly recommended to create and apply an integrated, 360 degrees evaluation framework. This unified framework ensures a convenient platform to the members of the given short supply chain based on which the evaluation of partners and determination of development can be done.

Considering customer-supplier relationships in short supply chains, trust and constant communication is the basis of a mutually beneficial relationship. Arising problems can be solved easilier together, meaning that customers have to communicate any occurring problems to suppliers, so that suppliers can react to them. In case of local products joint activities (such as joint marketing activity

detailed above) may enhance customer-supplier relationships and economical profit for both sides.

With respect to scientific literature and this study, it is advisable for local producers to consider acting in short supply chains, where customer-supplier relationships and the application of some kind of written supplier evaluation forms are of high importance.

The findings are based on scientific literature and the case study examined, therefore further research is recommended to broaden the knowledge on this topic. The future development of the topic could consider conducting a research in this theme with local producers, in order to get not only qualitative, but quantitative results as well. In addition to this, another aim is to test two supplier evaluation frameworks made by the authors based on this and previous researches. One of these frameworks is the Double Evaluation Platform, in which the evaluation of the supplier is made by the central organization and the consumers as well. The other framework is the PaTeNt©- SESC (**Pa**tó **Te**trahedrons of inter**N**ational **T**heory (Pató, 2015, 2017) **- S**upplier **E**valuation of **S**upply **C**hain), which is a visualized 3D model, presenting the members and relationships in short supply chains.

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INSTITUTIONAL EFFICIENCY, ENTREPRENEURSHIP, AND THE PREMISES OF ECONOMIC DEVELOPMENT IN THE EASTERN EUROPEAN COUNTRIES

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Abstract
The development gap between the "Old" and "New" member countries of the European Union is an important problem challenging the efficiency and strength of the European single market. In this regard, a subsequent question arises: which actions in the policy making must be undertaken, by both national and supranational authorities, to stimulate cohesion in the EU and which directions should be followed? The present paper tries to answer this question considering the perspective of the Eastern European nations and their economic development premises analysing the aspects of governmental participation in the economy and the influence of entrepreneurship upon long run competitiveness. The research results explicitly underline that entrepreneurship in the Eastern European nations is a determinative driver of long-term economic competitiveness due to its favourable impact upon the formation of human capital, enhancement of innovation potential and overall intellectual resources of nations. The effects of governmental participation in the economy upon the economic growth premises are heterogeneous including on the formation of physical and intellectual capital. Consequently, it was reached the conclusion that the Eastern European Nations should prioritise entrepreneurship since it is capable of boosting human capital creation and, at the same time, they should improve the institutional quality to minimise the factors undermining the business including corruption and red-tape, etc. In such a way, the Eastern European countries can overcome, in the long run, the development gap with the Western EU states and raise their economic potential.

JEL classification: F15; O11; O25; O38; L26;

Keywords: Eastern Europe, entrepreneurship, public sector, human capital, economic growth.

1. Introduction

The European Union is the most important achievement of the European nations. Born in the difficult post war ages, the European Union proved to be a

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strong promoter of democracy, peace and progress on the world arena, the merit which was awarded the Nobel Prize for Peace in 2012. Moreover, the community has become a space of security, liberty and prosperity where rule of law, the pursuit of happiness, justice and equity are offered priority and are protected. Thus, it was not a surprise that in the post-soviet era, the former USSR satellites i.e. Estonia, Latvia, Lithuania, Poland, Hungary, Slovakia, the Czech Republic, Romania and Bulgaria have chosen to build a European future. These nations integrated into the European Union in 2004 and 2007. Presently, there are 15 and 12 years respectively since these countries are EU members.

Major successes and achievements have been reached since then, including in diminishing the development gaps between the Western and Eastern parts of the European Union. Nevertheless, these are not eradicated and seem to require a longer period of time, development differences being a serious threat to the unity and efficiency of the single market. These disparities create tensions among the European Union partners which menace the future existence of the community, Brexit and the raise of the European scepticism being two of the main consequences. In this regard, a subsequent question arises: which actions in the policy making must be undertaken, by both national and supranational authorities, to stimulate cohesion in the EU and which directions should be followed? According to Capello (2018), Védrine (2018), Scheurer and Haase (2018), Gänzle et al (2019) and Berkowitz et al (2019) the key towards diminishing the discrepancies among the EU states is, firstly, through reducing the development differences between the capital cities or major cities and the regions inside the EU's countries. At the same time, Balland et al (2018), Antunes and Loughlin (2018) and Gehring and Schneider (2018) underline the idea that regional progress can only be achieved through improving human capital, technology and access to financing for local entrepreneurs. Becker (2019), Medve-Bálint (2018) and Mikuš et al (2019) point that the support to local business sector through cohesion funding is one of the strategic directions which has been promoted by the EU, the situation contributing to stimulating growth. The majority of the authors, ideas expressed in the literature review section, tackle the aspect of cohesion from the policy making perspective of funding allocation touching supranational, national and regional levels. This paper comes to tackle the aspect of development discrepancies from the perspective of single-market organisation, different from the specific cohesion policy implications.

The present paper tries to analyse these aspects considering the perspective of the Eastern European nations and their economic development premises emphasizing the roles of governmental participation in the economy and the influence of entrepreneurship upon long run competitiveness. As a result, several objectives have been established including: first, assessing the degree to which the governmental participation in the economy is efficient enough to enhance the growth premises of the Eastern European Nations and, second, measure the capacity of local entrepreneurs to raise the level of economic competitiveness. It is necessary to underline that the present paper aims to achieve these objectives considering the nations' physical and human resources and their interaction as well as entrepreneurial and public sector efficiency. As a result, the article intends to answer whether the European Union can minimise or totally eradicate discrepancies by creating a more consistent business environment in terms of regulation and opportunities for all the member countries.

The research results explicitly underline that entrepreneurship in the Eastern European nations is a determinative driver of long-term economic competitiveness due to its favourable impact upon the formation of human capital, enhancement of innovation potential and overall intellectual resources of nations. The effects of governmental participation in the economy upon the economic growth premises are heterogeneous. This fact is conditioned by the differences in institutional efficiency, quality and accountability. Consequently, it was reached the conclusion that the Eastern European Nations should prioritise entrepreneurship since it is capable of boosting human capital creation and, at the same time, they must improve the institutional quality as to minimise the undermining business factors including corruption and red-tape, etc. Therefore, the Eastern European countries can overcome in the long run the development gap with the Western EU states and raise their economic potential.

2. Literature review

The researched matter is of strategic importance for the future development of the European Union in the conditions of growing internationalization and globalization. Therefore, there have been elaborated many articles covering various aspects of how institutional efficiency influences entrepreneurship and which are the driving forces of economic development considering the realities of the Eastern European Union nations. Thus, according to Persson and Sharp (2015) the economies of European countries are presently interconnected, the relationships evolving during the centuries. Despite of multiple wars between various European states, trade among nations was never stopped. However, the first and second World Wars were the most disastrous events undermining the prior economic supremacy of the European nations, while the communist threat put the ruling elites under enormous pressure. Thus, in the after-war period, European states found it necessary to build a common future to avoid wars and oppose the tyranny of communism. Thus, it was established the core of the European Union formed by Federal Germany, France, Italy, Belgium, Netherlands and Luxembourg. It was the first step towards consolidating Europe under mutually shared democratic values. European project was successful since it won in the Cold War and convinced other European nations about the benefits which can be shared if collaborating not competing. In 1992, the European Union was established in the form it is presently known and the European integration gained a continental character many countries setting as a key priority joining the community.

Dunning (2014) mentioned that globalization certainly is the process which raised the efficiency of global economy. It has changed the complexity of business which is presently dominated by technology, ingenuity and innovations. Multinational corporations are the main drivers of globalization which are strong enough to develop large scale strategies, to implement and exploit technological advancements to maximize the own benefit considering the interests of general public. At the same time, Ahlborn and Wortmann (2018) highlight the role of the interconnected business networks which have increased chances of surviving the competition. To efficiently integrate the businesses into clusters countries, it is needed policies motivating firms to consolidate their activities. Popkova and Tinyakova (2013) underlined that each of the European Union member state needs community's

market since it reinforces countries' economic competitiveness. The European integration of the former communist nations strengthened both the Western developed nations as well as the newly integrated ones since it provided increased growth opportunities for the community as a whole.

Simultaneously, Comes et al (2018) point that absorption of FDI is a strategic task for less competitive countries, yet, this is only the first step, the second is the most important and namely, integration of local businesses within the operations of the larger foreign firm. In their turn, Pereira and Galego (2018) stressed the idea that the expansion of the EU towards East allowed the Western companies to benefit from various economic opportunities, including lower wages. This situation strengthened the competitiveness of the European business on the global arena. In this regard, Rusu and Dornean (2019) concluded that the European integration of Eastern economies might have reduced the short run competitiveness, yet long run positive effects come to comprehensively compensate. Accordingly, a consolidated Europe is much more efficient in facing global scale challenges due to larger opportunities provided by the single market.

Peet and Hartwick (2015) concluded that economic growth determines how the people live in terms of welfare, social conditions and income. It is the responsibility of governments to establish the development priorities which will mobilize the efforts of present generations to provide the future ones with better socio-economic environment. Hodson (2018) remarked that economic progress is linked to long run development strategies which are comprehensively establish on step-by-step action plans. Michálek and Výbošťok (2019) underlined that the Eastern European Union Nations have demonstrated that having a long run development plan is an imperative condition to provide the future generations with more favourable socio-economic environment. These plans tackle multiple dimensions starting from reduction of inequality and assuring better income distribution and finishing with fostering the entrepreneurial climate. Thus, these countries have successfully overcome transition, implementing reforms and integrating into the European Union in a relatively short period of time while most of the former Soviet Republics, excepting the Baltic ones, either failed economically or slipped into hybrid regimes due to the lack of long-term orientation (Peet and Hartwick, 2015). Liñán and Fernandez-Serrano (2014) come to add that economic development, income of a nation and the level of entrepreneurial activity is closely linked with the dominant culture within a society. This fact can be expressively observed within the European Union where important cultural differences among the Western, Northern, Southern and Eastern parts shape the socio-economic environment. In such a way, the main driver of economic growth- entrepreneurship varies from country to country the fact depending both on the legal framework and cultural values. Bolea et al (2018) as well as Capello and Perucca (2018) mentioned that despite of the heterogeneous cultural environment, the European demonstrated that it can establish a functioning single market. It is the responsibility of the national and supranational authorities to foster its efficiency through enhancing the integration and smoothing cross country economic environment. The social oriented market economy system which is predominant in the European Union, and despite decreasing the profit margins for businesses on overall, it is favourable for SMEs (Medve-Bálint, 2018). Yet, its success is spread unevenly due to the heterogeneity in terms of institutional efficiency (Fiaschi et al, 2018).

Jorgenson et al (2014) pointed that present economic development should be sustainable to permit the future generations to satisfy their needs. This fact requires minimization of dependence between the produced welfare and energy consumption. The Eastern European countries unlike the Western counterparts have not reached an advanced level of technological development to minimize the negative effects of excessive energy consumption and its direct connection with the produced welfare. Nevertheless, during the last decade important achievements were reported in several Eastern European nations the fact demonstrating the positive dynamics in the region.

Graeff and Svendsen (2013) and Degl'Innocenti et al (2018) underlined that there is a considerable economic development gap between the Northern, Western and Eastern European countries. One of the main causes why the last are underdeveloped regards the low level of social trust as well as relatively high levels of corruption. Entrepreneurs within an unsecure business environment tend to minimize their expenses to become less exposed to uncertainties, while in a stable and transparent environment they invest more to gain more return and therefore increasing overall societal wealth. Therefore, it is necessary to raise social awareness to protect businesses from excessive bureaucracy and corruption in order to determine higher economic activity. Cuaresma et al (2014) added that there are important differences between the level of development of the Western and Eastern European Union regions. There is a weak level of regional convergence due to the overall disparities in the countries' level of development.

Rollnik-Sadowska and Dąbrowska (2018) underlined the idea that it is necessary to reduce the level of disparities inside the European countries, first, as this will permit to mobilize more efficiently national resources and business efforts. Porte and Pavón-Guinea (2018) observed that growth tendency is more visible in the regions containing capital cities. Moreover, the positive dynamics are more evident if in the area are present more capital-intensive activities. Thus, it is imperative to connect regions to capitals, this task being strategic for future reduction of cross countries disparities. Telò (2014) emphasized that regional economic development is closely linked to the central government initiatives regarding business activity. Due to the advanced level of infrastructural development in the Western European countries, there is a low development gap among regions. In the Eastern European Union countries infrastructure is rather weak this fact causing ununiformed economic development this fact hampering the overall countries' economic performance. Thus, an essential condition to accelerate growth and minimize development gap between the Western and Eastern European countries is to provide the last with performant infrastructure connecting regions.

Oesch (2013) stressed that the level of technological development is crucial in determining increased efficiency of entrepreneurial activities. Moreover, education plays a catalyzing role establishing future priorities of business' activities. These elements of socio-economic environment o are key factors establishing country's present and future competitiveness and economic structure. The Western European Union countries succeeded in gaining competitive economic advantages due to their high performance in terms of technology and education which allows these countries to maintain their economic superiority over longer periods of time. The main competitive weakness of the Eastern European nations is the lack of effective technological driven business and proper education system to provide the future

generations with the necessary skills and abilities. At the same time Tabellini (2010) considered that cultural factors are among the most important drivers of economic development since the predominant values within a society can stimulate or not entrepreneurship. Culture is assessed through the intermediation of individual values and beliefs such as trust, respect and confidence. These values determine the efficiency of institutions and their accountability. It is necessary to underline that social environment and culture develop during longer periods of time and tend to remain inflexible when considering reforms and changes. Nevertheless, if there is enough political willingness than implementation of reforms tends to be more efficient and dominant values within a culture are changed towards adopting new ones.

Aslund (2013) pointed that the consolidation of institutions and democracy in the Eastern Europe after the fall of the communist was much more successful in several countries than in others. The differences among the countries occurred as a result of policies promoted which in some nations were vague and not functional. Moreover, there was important discrepancy in leadership which failed to promote strong step-by-step reforms-oriented programmes. Thus, only 9 countries have successfully overpassed the transition period and integrated into the European Union. Central states adopted free markets based on social welfare mechanisms setting up high taxes, regulation and social transfers which reduced their economic flexibility and development. At the same time, the Baltic States succeeded to progress by much less accentuating the principles of social welfare stressing the importance of liberalistic ones the fact allowing them to record higher economic growth. The South-eastern countries straddled to combine both, welfare and liberalistic models. Quatraro and Vivarelli (2014) underlined that institutional framework is crucial to determine productive entrepreneurial activity capable of realizing the socio-economic development goals. In general, institutional efficiency is one of the most important macroeconomic indicators motivating the country to either succeed or not in terms of internal and external investments' attraction which is the driving force of growth. Moreover, institutions and operating framework determine the willingness of entrepreneurs to undertake risky projects, to entry new markets or start up new businesses. Thus, if there is an interest to develop entrepreneurship, policy measures should be directed towards the minimization of entry barriers and reduction the cost of failure. Moreover, Rodríguez-Pose and Di Cataldo (2014) highlighted that institutions are determinative in assuring proper framework for innovation development. Government through the provision of relevant regulation can enforce country's capacities in creating, implementing and benefiting from innovation. In this case, the quality of government in terms of corruption eradication, rule of law, governmental effectiveness and accountability is crucial. Thus, there is a strong link between the efficiency of institutions and the competitiveness of countries in terms of innovation. The peripheries of the European Union are most vulnerable in the front of corruption the fact which should motivate the European level authorities to undertake proper measures to combat red tape and inefficient bureaucracy. Furthermore, Salahodjaev (2015) accented that economic performance is determined by the strength of institutional arrangements which either enforce democracy, social capital accumulation and intellectual development or not. Democracy not always leads to higher economic performance while social intelligence does since it stimulated innovation and higher productivity, nevertheless, it is essential in creating favourable environment for the entrepreneurial progress and long run stability. According to Ignatov (2019),

quality of institutions and efficiency of market mechanisms is a matter of strategic economic security since it determines the capacities of nations to face future challenges. Thus, governments seeking to increase their economic growth should provide favourable policies to consolidate institutional framework which is decisive in assuring both auspicious business and social environments.

Dijkstra et al (2013) mentioned that in the past there was an evident tendency that largest cities tend to progress more rapidly than the other regions due to the extensive availability of capital and human resources and relatively intensive use of them. Nevertheless, in the developed countries of the European Union this trend has slowed down and even reversed during the last decade. This fact comes to contrast with what the principles of global cities, urban economics and new economic geography literature say. The factors which motivate such an evolution are determined by inefficiencies of the permanently growing cities. Moreover, the relatively advanced level of development of regional infrastructure creates favourable preconditions for growth of smaller centres. Camagni and Capello (2013) concluded that regional economic competitiveness is dependent from the existing territorial capital. The differences in capital create alternating growth patterns which depend on multiple factors which characterise the quality and efficiency of the assets. Besides physical and intangible capital exiting in a region, the human one is also crucial to motivate economic progress since it provides future development perspectives and raise of economic competitiveness. Considering the depth, quality and extension of national assets, proper development strategies should be undertaken by countries to maximise the use of the production possibilities frontiers and extend them.

Ignatov (2017) pointed that the main advantage of the European Union relies in its flexible system permitting the promotion of individual economic policies which can offer proper solutions to the present and future challenges a country may face. Estonia, one of the former soviet countries, succeeded in developing and implementing efficient liberalistic policies which in some aspects are in contrast with the social driven ones of the European Union. Thus, this small former communist nation gained significant economic empowerment by fully exploiting the benefits of liberalism consolidating its entrepreneurial environment. Thus, countries are free to choose their own development pathways, including in such areas as FDI attraction. Forte and Moura (2013) mentioned that FDI is an important input determining host countries' economic growth. The degree to which an economy is capable to attract investments and benefit from depends on a variety of internal factors including infrastructure, human capital, technological preparedness and level of economic openness, etc. Government is the key economic player capable of balancing all conditions to create favourable climate for investments' projects implementation by leveraging risks and opportunities. In such a way, properly developed and applied policies can enforce country's economic potential assuring suitable environment for socio-economic progress. Tintin (2013) considered also that FDI is one of the most important factors driving economic growth in the Eastern European Union countries. Nevertheless, not all states benefited in equal measure from the investment flows, some nations being more efficient attracting and retaining investments than others. The factors which determined FDI performance summarise to the following institutional transparency, GDP size, economic freedom and strength of democratic values. In such a way, it can be

concluded that internal economic conditions are decisive in motivating higher FDI efficiency. At the same time, Voigt et al (2014) underlined that technological development of a nation is a determinant factor motivating productivity of its economic activities. Moreover, in the present conditions when sustainability of human activities has become of increased concern, innovation is widely applied to minimise the dependency of produced welfare from energy intensity and switch it to more technology intensity. Growth of regional competitiveness in terms of technological readiness is crucial in providing smooth and balanced overall growth. In such a way, it is necessary to minimise the development heterogeneity, an essential condition for future growth. While Weber et al (2016) accentuated the infrastructure is a driving factor of economic development and cohesion among countries as well as regions. It represents the most important asset of a country which determines its growth perspectives. Unless the government succeeds in assuring a proper infrastructure to the business sector the economic growth remains weak and feeble. In such conditions, one of the tasks of developing economies is to develop efficient infrastructure networks capable of satisfying long run economic needs. Szabo et al (2013) remarked that efficient and flexible enterprises are the main driving force of dynamic economic growth. Thus, they should be supported by the government with the provision of effective infrastructure, simple procedures and transparent bureaucracy. However, these conditions often require political willingness and most of the time reforms which in the short run could not be very popular yet necessary to establish future growth perspectives.

By examining this literature, it has been reached the conclusion that economic growth including in the Eastern European Union countries is determined by institutional strength, availability of proper infrastructure, cultural factors, degree of technological and innovation development as well as governmental initiatives stimulating entrepreneurship and business activity. Consequently, the present research paper aims to assess the degree to which each of these factors influenced the economic development of the Eastern European Union states.

3. Methodology

The present research applies quantitative analysis in order to evaluate the influence of governmental control over economic activities and of entrepreneurial competitiveness upon the premises of economic development in the Eastern European Union nations. Consequently, it is assessed the total general government revenue percentage of GDP which is an indication of the weight of the public sector in the total economy. It is a quantitative measure of the operational cost of governance determined by the past and present political decisions. The main components of gross governmental revenue include the direct taxes levied on income and wealth as well as the indirect ones including production, import taxes and taxes on capital growth, social contributions and other sources. The entire collected revenue makes the government to meet its commitments in terms of education, healthcare, provision of infrastructure, etc. Second indicator analysed is per capita Business enterprise sector R&D expenditure. It reflects the degree of competitiveness of the business environment in a country. Hence, if entrepreneurship is strong, it is innovation driven, business being capable of spending more on research and development activities. Namely innovation achieved through R&D

determines the degree of business complexity which provides either more or less value added to a society. As a result, governmental revenue and business competitiveness are the two main components of a society driving economic activity.

The next step in the research is made by analysing the principal prerequisites of economic development and their evolution in time. The first premise is the gross capital formation within an economy. This indicator reflects the formation of new fixed assets by government, business and households. Moreover, capital formation shows how much of the value added within an economy is invested rather than consumed. Therefore, the higher is the level of this indicator higher is the probability of an economy to expand, it assuring the fundamental material endowment (Boamah et al, 2018, Afonso and Aubyn, 2019, and Ruiz, 2018). The next economic growth premise is represented by the net inflows of FDI. Foreign direct investments are one of the main drivers of economic development in the modern economy since it motivates employment and growth of production. It is a key component of globalisation and economic integration being one of the elements of international economic flows, alongside with labour, trade, finance. FDI motivates both short and long run economic progress by stimulating higher employment, technology and knowledge transfer and industrial growth (Comes et al, 2018, Fagerberg et al, 2018). The third premise is the employment in knowledge intensive business activities. If this sector increases in relation to the total economy, then the economy is producing more intensive value-added products since the accent is put on quality. Namely, knowledge-oriented business is capable of offering most feasible solutions to modern and future challenges. This indicator is reflecting human capital which is determinative in creating and exchanging new economic value. Enhancing the quality of a nation's intellectual resources requires much time and investments, therefore, these assets are crucial in raising competitive economic edges (Boamah et al, 2018, Afonso and Aubyn, 2019 and Ruiz, 2018). Final premise of economic growth is the evolution of trademarks' publication. This indicator is closely linked with the previous one representing one of its outputs. Trademarks are the core of a developed economy being a key component of its advanced business activities. If this indicator improves in dynamics the economic and competitive potential of a nation is also growing as a result of the fact that it is capable of creating, promoting and benefiting from intellectually protected products and services (Thompson, 2018, Visvizi et al, 2018, Pradhan et al, 2018). Finally, it is calculated the correlation between the participation of government within economic processes, entrepreneurship and the premises of economic development to identify which is the degree of interdependence among these indicators.

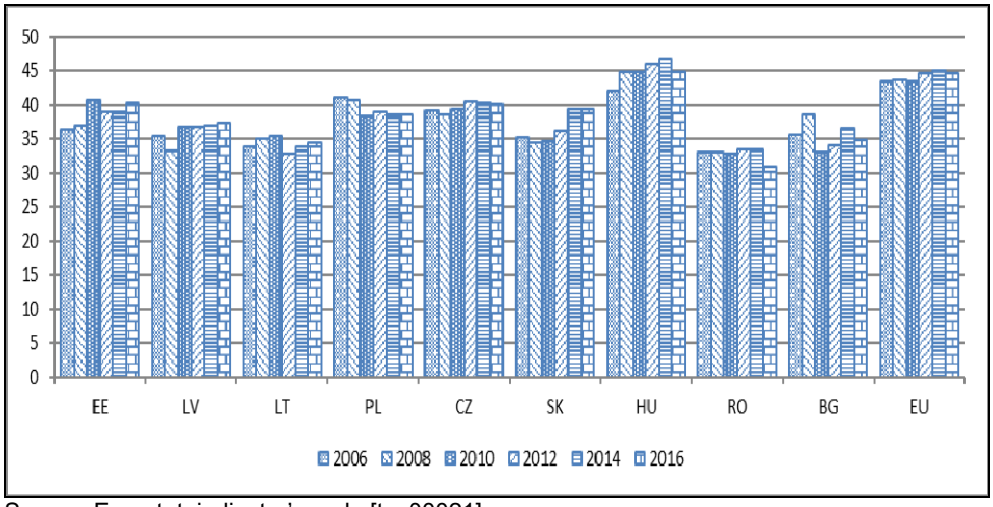
4. Results

a. Share of government in the economies of the Eastern European Nations

In order to assess the influence of institutional efficiency upon the economic development of the Eastern European Union countries it is necessary to evaluate the weight of governments within economies (figure 1). As it can be observed, the overall bureaucratic control over the economy in the European Union has ranged during 2006-2016 within 43% and 45%. At the same time, the vast

majority of the analysed states have lower level of governments' participation within economies. Romania and Lithuania in 2016 registered the lowest weights of government participation in GDP, 31% and 34.5% respectively. These states are followed by Latvia and Bulgaria, 37.4% and 34.9%. Slovakia, Czech Republic, Estonia and Poland record 39.3%, 40.1%, 40.3% and 38.7%. Hungary is the only country from the selected ones registering above the European average levels of government implication in the economy, nevertheless, in 2016 it tends to match it. As a result, it can be underlined that the weakest economies from this group and namely Bulgaria, Romania and Latvia have lower direct governmental control over economic processed the fact meaning lower taxes intended to reignite economic activity.

Figure 1. Total general government revenue % of GDP in the European Union New Member States.



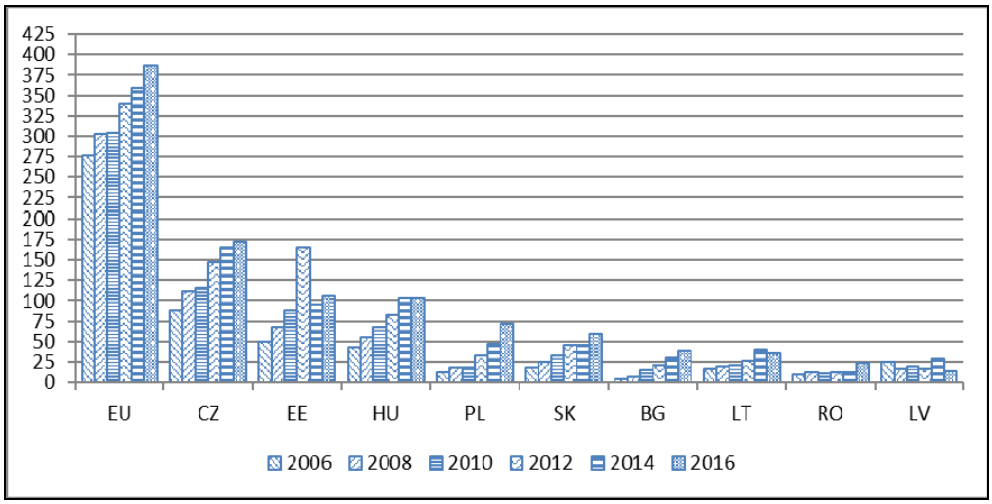
Source: Eurostat, indicator's code [tec00021]

b. Entrepreneurial competitiveness in the Eastern European Nations

Entrepreneurship is one of the main drivers of economic development (Schumpeter 1934, Wennekers et al 2005, Acs et al 2008). The stronger is the business sector of a country more viable is the economy. One of the indicators through which it can be assessed the level of competitiveness of entrepreneurship within an economy is the per capita business R&D expenditure. As it can be observed in the figure 3, there are considerable disparities between the levels of business development in the Eastern and Western European Union. Thus, none of the states even close comes to the European Union's average in terms of per capita business sector R&D spending. Accordingly, by 2016 the EU reached 381 EUR while the highest value in its Eastern part was 171 EUR, and namely in the Czech Republic. It is important to mention that there can be explicitly pointed that even among these countries it can be distinguished between leaders and followers. Thus, the states having most robust business sector are the Czech Republic, Estonia and Hungary which achieve levels of per capita expenditure of more than

100 EUR, followed by Poland and Slovakia, scoring between 70 and respectively 60 EUR. The rest of the countries are least competitive in terms of entrepreneurial activity and strength of business hitting less than 50 EUR and in specific cases less than 25 EUR. Positive and stable dynamics in terms of entrepreneurship can be observed in Czech Republic, Poland, Slovak Republic and Bulgaria where it can be assessed gradual growth of the business performance. It is necessary to remind that per capita business R&D expenditure is an indicator applied to identify business competitiveness due to the fact that the stronger is this sector then more investments it will provide to innovation related activities which in turn motivates higher economic efficiency.

Figure 2. Per capita Business enterprise sector R&D expenditure, EUR



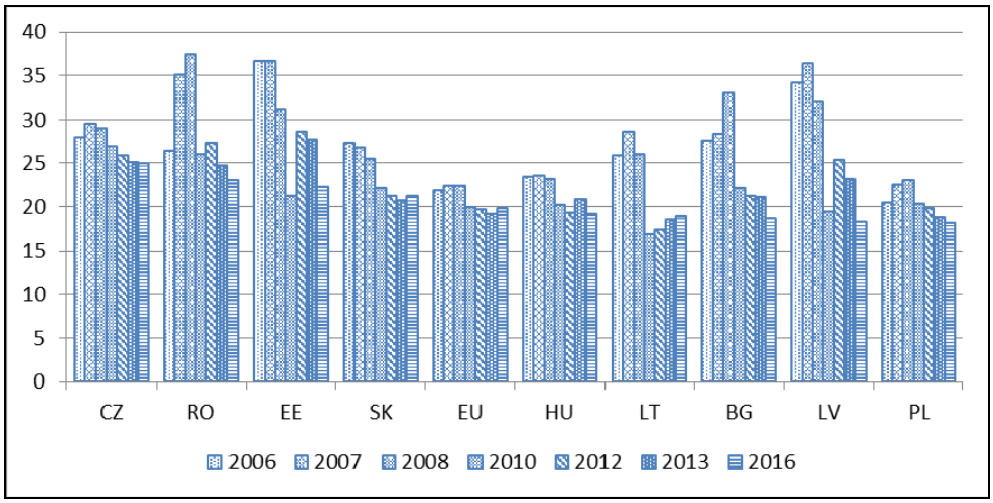
Source: Eurostat, indicator's code [rd_e_gerdtot]

c. Fixed capital formation: premise number 1 of economic growth

By analysing gross fixed capital formation (figure 2) it can be assessed long run perspectives of countries to support economic growth. Thus, it can be observed that during the period of 2006-2016 capital formation in the European Union has gradually decreased and never reached the pre-crisis levels from 22.4% (maximum value reached in 2007 and 2008) to 19.8% in 2016. In the analysed countries the drop in the capital formation is steeper falling closer to the European Union average. Consequently, in the pre-crisis period the maximum heights were reached by Romania, 37.4%, 2008, Latvia, 36.4%, 2007, Estonia, 36.6%, 2007, and Bulgaria, 33%, 2008, while in 2016 these levels being 23%, 18.2%, 22.3%, and 18.6% respectively. In Lithuania the decline was also abrupt, from 28.6% in 2008 to 18.9% in 2016. Hungary, Poland, Slovakia and Czech Republic have registered also negative dynamics, yet, the long run perspective is more stable. The evolution of the gross fixed capital formation expresses the idea that the fundament for economic development in some Eastern European Union countries

(second range) was more balanced while in other states (first range), this fact being crucial in determining the further growth in the economic competitiveness.

Figure 3. Gross fixed capital formation percentage of gross domestic product

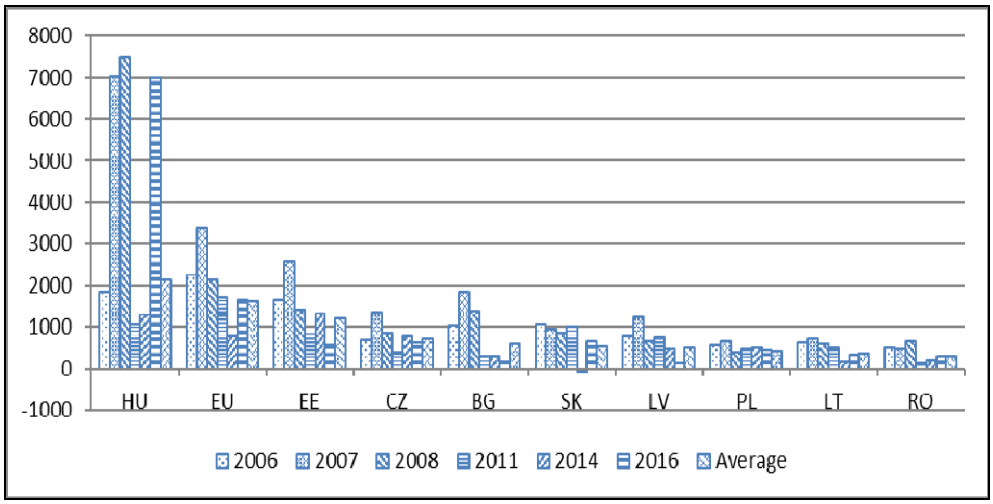


Source: Eurostat, indicator's code [nama_10_an6]

d. FDI performance: premise number 2 of economic growth

Foreign direct investments are a major source assuring more favourable economic growth perspectives for an economy, especially when it creates economic clusters with the local firms. Therefore, governments all around the world are interested in attracting FDI since it improves economic potential. Eastern European Union countries are not an exception. In the figure 4 it has been calculated the per capita FDI performance the fact permitting to make abstraction from the absolute size of an economy and therefore obtain more relevant observations. Hungary, despite of having alternating success in attracting FDI, is by far the country which managed to attract highest per capita FDI. Thus, during the period of 2006-2016, this country managed to report three years of per capita net inflows exceeding 7000 US$. In other 4 years, Hungary's performance ranged between 1070 and 1850 US$. Nevertheless, such evolution determined 4 years of net investments outflows which, however, are much lesser. The other states have higher FDI performance in the pre-crisis years, including the European Union, and more modest results in the years following. After Hungary, Estonia and Czech Republic point relatively high levels of per capita FDI during the whole period which in 2016 reached 563 and respectively 615 EUR, while the average European level was 1632 EUR. The observation made are justified if examining the average FDI performance by country during the period of 2006-2016, then it can be mentioned that Hungary leads with 2133 US$, followed by EU, 1606 US$, Estonia, 1200 US$, Czech Republic, 718 US$, Bulgaria, 605 US$, Slovakia, 538 US$, Latvia, 511 US$, Poland, 410 US$, Lithuania, 364 US$, and Romania, 291 US$.

Figure 4. Per capita foreign direct investment, net inflows (BoP, current US$)

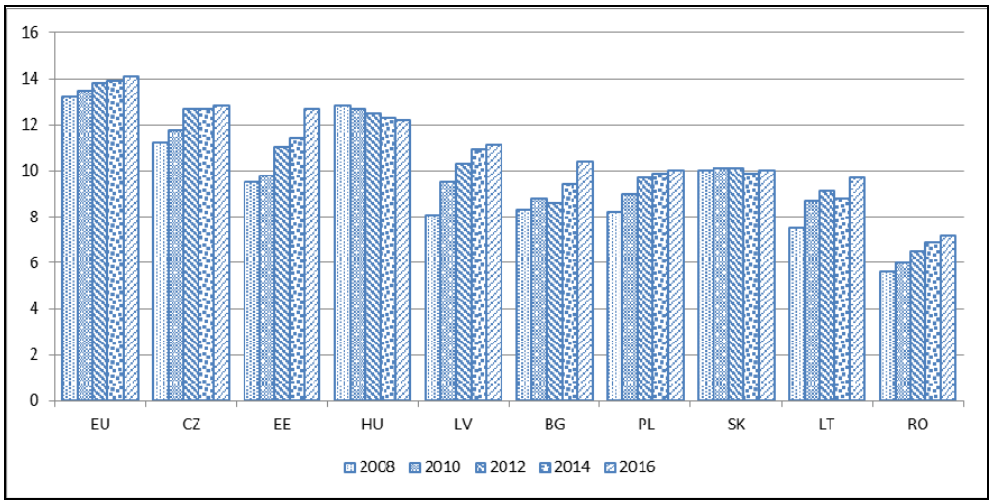


Source: World Bank

e. Employment in knowledge intensive business activities: premise number 3 of economic growth

An important indicator on the base of which it can be analysed the future competitive potential of an economy is represented by the employment in knowledge intensive business activities % of the total employment. This indicator marks the evolution and the actual status-quo of the degree of complexity of an economy which should be considered to effectively appraise the future growth perspectives in the area of innovative entrepreneurship, in particular, and in general, in the field of innovative economic capacities. In other words, the higher is the share of people employed in knowledge intensive business activities, the more innovative potential a country is in favour of. As it can be observed in the figure 5, none of the researched states reaches the level of European Union's average which in 2016 was more than 14.1%. Among the analysed countries, the highest values of this indicator in 2016 were reached by Czech Republic, 12.8%, Estonia, 12.7%, and Hungary, 12.2%. Romania is the only country which registered values lower than 7.5%. If analysing in dynamics the indicator, then it can be underlined that Estonia enlarged the share with 3.2%, Latvia, 3%, Lithuania, 2.2%, Bulgaria, 2.1%, Poland, 1.8%, Czech Republic and Romania, 1.6%, while the EU growth in this share was 0.9%. Slovak Republic has recorded no change of this indicator. At the same time, Hungary faced decrease in terms of knowledge intensive business activities, -0.6%. Addressing this issue, it is necessary to remark that Romania, registering lowest value, Hungary and Slovakia, facing long run stagnation, as well as the European Union, need to develop policies to stimulate high intellectual intensive business activities to increase the employment of population in these areas. This fact will motivate the overall growth in terms of economic competitiveness and entrepreneurial complexity capable of producing more wealth and value-added maximising efficiency.

Figure 5. Employment in knowledge-intensive activities - business industries % of total employment



Source: Eurostat, indicator's code [htec_kia_emp2]

f. The evolution of trademarks' publication: premise number 4 of economic growth

An important indicator showing the degree of maturity of the business environment within an economy is the number of new registered trademarks. This indicator shows the number of businesses which sufficiently developed as to apply for intellectual rights protection, thus, these businesses provide a product or service which presents a certain degree of novelty, innovation or uniqueness. In other words, trademarks compose the core of an advanced economy capable of offering specific and recognised products. In the table 1, there is presented information regarding the number of people in a certain country per one trademark publication. In such a way, it can be generally assessed how much population it is needed to establish a trademark. Ideally, the lower the number is more advanced and competitive the business is. As it can be observed in the table 1 the dynamics are positive in all of researched countries as well as in the European Union. Despite of positive evolution only Estonia managed to overcome the European Union's average. Other states which register relatively high positions are the Czech Republic, Lithuania, Poland and Bulgaria. Finally, there come Latvia, Slovakia, Hungary and Romania. Consequently, by analysing the evolution of the number of people per one trademark publication in these countries on average it takes 80% less population, while in the European Union only 31%. Leading nations are Estonia, 90%, Bulgaria, 88%, Lithuania, 87%, Romania, 83%, Slovakia, 82%, Poland, 78%, Latvia, 73%, Czech Republic, 72%, and Hungary, 67%.

Table 1. Number of people per one trademark publication

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EE	46442	12188	12155	17331	8374	7949	6853	5315	4998	4163	4668
EU	10654	8653	7366	8746	7130	7259	7334	6855	6650	6191	7299
CZ	43944	21912	19856	28151	16392	15976	13580	14286	12712	12349	12238
LT	105481	43666	37626	24905	27169	24821	17784	14084	13513	10759	13422
PL	65874	38121	20687	30967	20732	23153	20608	18457	15290	12885	14720
BG	126684	87736	24406	32508	21945	21116	20016	18439	12412	12933	15735
LV	63382	56419	30241	47593	20564	19997	23933	16363	13943	13272	17047
SK	103328	49308	43034	48526	23441	28413	21374	22841	18815	16792	18591
HU	73514	42609	40314	42112	31546	30035	34446	26738	20772	19647	24242
RO	235486	123568	61861	96073	51650	49140	50909	55820	41914	36094	39176

Source: Eurostat, indicator's code [ipr_tp_tot]

g. Governmental revenue, entrepreneurship and growth premises: how much do they correlate?

It has been calculated several correlation coefficients in order to assess if institutions and business competitiveness directly interact. As it can be observed in the table 2, there is relatively strong positive interdependence between total general government revenue and gross fixed capital formation only in Poland, Romania and Bulgaria while in other countries there is strong negative correlation, Estonia, Latvia, Czech Republic, Slovakia, or weak one Lithuania and Hungary. It can be observed that at the level of European Union government control over the economy is negatively correlated with fixed capital accumulation. At the same time, there is strong interdependence at the general level of the EU between government revenue and business R&D expenditure, as well as in Czech Republic, Slovakia and Hungary. Six countries out of 9 examined register either no correlation or weak ones of any sign. Also, there is negative correlation or weak one between governmental control over the economy and FDI performance except Poland and Bulgaria. Moreover, it also passively interacts with the employment in knowledge-intensive industries. However, it is registered strong positive correlation at the community's level as well as in Latvia and the Czech Republic. More active interdependence can be assessed between government revenue and trademark publications dynamics, strong positive correlation being recorded for Latvia, the Czech Republic, Slovakia, Hungary and European Union in general. Simultaneously, the level of entrepreneurial competitiveness within an economy reflected through the per capita business research and development expenditure has weak or strong negative correlation considering capital formation as well as FDI performance. This fact demonstrates that more dynamic business within an economy does not necessarily leads to growth in fixed capital formation as well as in higher levels of FDI. Nevertheless, more competitive entrepreneurship is strongly correlated with the employment in knowledge-intensive activities as well as with trademarks' performance both at the level of the European Union as well as at the level of national states, with some minor exceptions.

Table 2. Summary of correlations

Correlation index between	AandB	AandC	AandD	AandE	AandF	CandB	CandD	CandE	CandF
EE	-0,82	0,06	-0,29	0,04	0,21	-0,33	-0,41	0,26	0,47
LV	-0,81	0,16	-0,54	0,87	0,76	0,2	0,31	0,31	0,19
LT	0,09	-0,31	-0,09	-0,47	-0,22	-0,42	-0,35	0,72	0,9
PL	0,57	-0,45	0,49	-0,45	-0,54	-0,75	-0,25	0,84	0,85
CZ	-0,65	0,79	-0,31	0,89	0,74	-0,82	-0,42	0,89	0,96
SK	-0,45	0,77	-0,56	-0,68	0,78	-0,75	-0,58	-0,53	0,91
HU	-0,13	0,75	-0,31	-0,6	0,76	-0,54	-0,25	-0,51	0,94
RO	0,42	-0,24	0,1	0,13	-0,03	-0,23	-0,05	0,62	0,54
BG	0,44	0,1	0,57	0,28	0,01	-0,77	-0,63	0,94	0,87
EU	-0,71	0,82	-0,4	0,78	0,67	-0,73	-0,45	0,94	0,81
A	Total general government revenue % of GDP								
B	Gross fixed capital formation percentage of gross domestic product								
C	Per capita Business enterprise sector R&D expenditure								
D	Per capita foreign direct investment, net inflows								
E	Employment in knowledge-intensive activities - business industries % of total employment								
F	European Union trade mark (EUTM) publications								

Source: Own calculations.

5. Conclusions

The researchers have analysed cohesion and economic growth in the European Union considering different perspectives, for instance Ahlborn and Wortmann (2018) highlighted the role of the interconnected business networks, Comes et al (2018) pointed that efficient absorption of FDI is strategic, Hodson (2018) remarked that economic progress is linked to long run development strategies, Telò (2014) emphasized that regional economic development is closely linked to the central government initiatives, Oesch (2013) stressed that the level of technological development is determinative while Aslund (2013) pointed that the consolidation of institutions and democracy is important. In its turn, the present research concludes that single market is the main driver of economic development of the European countries, yet, not all member states are able to fully exploit the business opportunities due to lower quality of institutions and efficiency of market mechanisms leading to weaker entrepreneurial environment and business activity. Despite the fact that the level of fiscal pressure over the economic processes in the majority of the Eastern European Union countries is lower than the EU's average, weaker institutional performance erases this potential advantage for entrepreneurs. This determined the varying performance of countries in terms of economic development perspectives.

Business competitiveness does not necessarily affect the countries' achievements in terms of FDI and gross fixed capital formation. These indicators stimulate economic development, yet do not raise internal countries' innovation or entrepreneurial competitiveness. Also, it can be observed that the states from the Eastern European Union behave differently when examining the impact of the public sector upon the premises of long-term economic development, yet they

almost match when into account is taken the influence of entrepreneurship upon the innovation capacities. Considering the previous remarks and the research results, the paper identifies entrepreneurship as strategic development determinants which should be reinforced in the Eastern European nations through the promotion of business-oriented policies. Namely entrepreneurship is capable of mobilising internal economic development providing growth edges exceeding those assured by FDI attraction and investments in the fixed capital. Hence, the article advises policy makers from the Eastern European nations to undertake further efforts to boost entrepreneurial capacities of their nations making possible to overcome the existing development gap between the Western and Eastern EU. In this regard, it should not be expected that entrepreneurial activity will bring quick impact, yet in the long run entrepreneurship is efficient enough to raise overall economic performance.

The present research has confronted with several limitations. First limitation is linked to the difficulty met when quantitatively assessing the countries' institutional performance, and which is the development cost of weak institutions. Moreover, it was not examined the influence of corruption, shadow economy and red tape upon the economic growth premises. In other words, it remains unclear how much of the public sector's revenue in the Eastern European Union nations is wasted, missed or swiped out. Furthermore, a limiting factor is the presence of ununiformed environment the fact characterised by high heterogeneity.

Further research on this matter can be undertaken by considering the entire European Union. Also, there can be covered the aspects regarding the institutional quality and its influence upon the distribution of public resources. Moreover, entrepreneurship and public sector interaction can be research in more details reaching relevant conclusions and know which key aspects of bureaucracy should be attentively monitored to increase its accountability and economic efficiency. Furthermore, it can be assessed the impact of cross-cultural characteristics upon the evolution of economic competitiveness.

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WHAT DO MANAGERS THINK ABOUT THE SUCCESS POTENTIAL OF CRM CAMPAIGNS?

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Abstract
This research analyzes cause-related marketing (CrM) from the perspective of companies. The study aims to achieve a better understanding about what managers think about CrM by analyzing the level of acceptance and usage of this marketing tool, based on the UTAUT model. Using in-depth interviews as research method, we conclude that managers see the benefit of company partaken in initiatives as such, but not necessarily CrM. The reasons why managers choose to participate in Cause-related Marketing initiatives originate from the mix obtained through improving the firm by doing something considered socially positive. CrM was well evaluated by the participants and considered well positioned in terms of acceptance and usage, based on four factors: performance and effort expectancy, social influence, and facilitating conditions. Interviewees expressed excitement towards CrM and believe in it as a powerful tool to improve the firms' image and consumers feeling towards it. While the literature uses several concepts (Corporate Social Responsibility or Social Marketing), the interviewees emphasize genuine caring and showing interest, time and funds to support consumers social concerns.

JEL classification: M31;

Keywords: CRM, UTAUT model, performance expectancy, effort expectancy, social influence.

1. Introduction

The essence of CRM is marketing the product, service, brand or company through the link with a non-profit organization (Berglind, Nakata, 2005). This tie between these two parties and the final consumer is an upgraded strand of Corporate

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Social Responsibility, when comparing to donations, because the firm cares about one specific cause, which will have an impact on the perceived image that the consumer has about it (Quinones et Rebollo, 2009). According to Bennett (2008, p.44), "Although a substantial academic literature exists concerning consumer perspectives on CrM (…) research into corporate attitudes towards CrM has been negligible". This research serves the attempt to fill this void, and further explore the perspective of companies regarding CrM, assuming the purpose of finding out to which extent are companies aware of the existence of CrM, the benefits that this marketing tool can present to firms and how to implement it as a marketing strategy.

Considering the subject under analysis, some research questions were perceived as more relevant:

- How do managers perceive the CrM as a marketing tool? How do they perceive the potential success of CrM campaigns?
- What are the required elements to implement this type of marketing tool? And which advantages might result from this implementation?
- Which factors or elements do managers consider obstacles or barriers when considering the adoption of CrM?

2. Literature Review and research model

CrM: a win-win-win situation for all involved?

Facing an increasing concern regarding humanitarian topics, nowadays it is unthinkable the possibility of a company being something other than socially responsible, as "consumers are now looking closely at companies who make claims regarding their involvement on social issues" (Bronn, Vrionni, 2001, p.207). This demands companies to be socially responsible (Robinson et al., 2012) and further differentiate themselves and their products from competitors (Bronn, Vrionni, 2001). This way CrM emerged as a communication and differentiation tool used by several companies (Murphy, 1997).

Defined by Vanhamme et al. (2012, p. 259) as a "social initiative in which organizations donate to a chosen cause in response to every customer purchase made", CrM is often characterized as a win-win-win situation (Silva, Martins, 2017), because all the parts involved benefit from it: the company, the non-profitable organizations (NPOs) and final consumers (Berglind, Nakata, 2005).

In the consumer perspective, CrM, stimulates moral elevation, inspiration and motivation on customers to act on behalf their beliefs, frees them of the choice of which cause to support, making the action of helping more regular and convenient (Romani et Grappi, 2014; Berglind, Nakata, 2005), and also, consumers appreciate "the idea of contributing to the society while satisfying their individual needs" (Kim, Lee, 2009, p.467). For the cause, CrM allows non-profit organizations to get access to more financial resources, get more exposure and get more message efficacy and, in some cases, to receive "human resources in the form of new volunteers and advocates" (Berglind, Nakata, 2005, p.449). Additionally, for firms it promotes morale, retention and recruitment (Berglind, Nakata, 2005; Duncan, Moriarty, 1977; Bronn, Vrioni, 2001), it decreases the impact of negative publicity (Varajadan, Menon, 1988), it facilitates the entry in new markets (Varajadan, Menon, 1988), increases the possibility to charge higher or premium prices (Bronn, Vrionni, 2001), and, probably, it is the most important benefit enhancement of consumer's preferences as it also increases the choice of a specific brand, when in comparison with competitors.

These are some of the main benefits that can be obtained due to CRM (Duncan, Moriarty, 1977; Barone et al, 2000; Bronn, Vrioni, 2001).

Even though not so notorious, or with the same level of impact, comparing to the potential benefits, it is important to state that CrM also presents disadvantages and risks for the company: besides the fact that CrM campaigns can backfire and hurt the reputation of both parties involved (Demetriou, et al., 2010), CrM tends to appeal only to people sympathetic with the cause (and it's nearly impossible to find a cause that appeal to everyone), can have "a negative effect on those members of a society who are critical of the cause", and can lead to a reduction in the relatedness and affinity that some consumers might feel toward the company (Sheikh, Beise-Zee, 2011, p.28).

Despite the fact that the numerous advantages surpass the risks that CrM presents for the parties involved, it has been the subject of harsh critics and skepticism (Barone et al., 2000). Under scrutinized analysis is the motivation that drives companies to engage with causes (Smith, Stodghill, 1994). Consumers often question the reasons why firms embrace a campaign of this kind: "whether a company's support of a social cause is designed to benefit the cause or the company" (Barone et al., 2000, p.249). Even published authors that study this topic have divergent opinions regarding it: Demetriou et all (2010) assumed to interpret CrM as a commitment from the company to the society where the firm operates; Robinson et al (2012) sees this tool as a two purpose type of marketing, because it supports a social cause, while simultaneously improves the firm's performance; Liesse (1990) believes that when recurring to CrM profitable organizations are trying to profit from non-profit organizations; authors, like Bronn, Vrioni (2001) consider these campaigns an attempt to look good after a negative situation; and few even contemplate CrM campaigns as a diversionary tactic to hide deeper problems and "clever manipulation to enrich a corporation's coffers" (Berglind, Nakata, 2005, p.444). As consumers, we are accustomed to denoting "social responsibility as a behavior of companies and philanthropy as a behavior of individuals, but when an individual has control of a company, these distinctions become blurred", and we lose insight of the real motives that underlie behind these kind of initiatives (File, Prince, 1998, p. 1529).

With the intent to fight the skepticism, extensive literature exists to help corporations achieve a successful CrM campaign, but the question remains: are managers aware of what take under consideration when planning a CrM campaign? According to the literature, firms should, in order to implement a successful campaign: present a consistent and believable contribution to a cause (Bronn, Vrionni, 2001), tie the cause to the organization, use this tool as a long term strategy (Bronn, Vrionni, 2001), "carefully pair the cause and company" (Berglind, Nakata, 2005, p.452) because the level of company-cause fit influences the consumer (Grupta, Pirsch, 2006), choose a cause that suits the firm's customer profile, the characteristics of the firm's product, and the brand image and positioning (Varajadan, Menon, 1988), be genuine and transparent in their behavior as a trustworthy campaign is crucial for the support of consumers (Bronn, Vrionni, 2001; Webb, Mohr, 1998) and most important, be very careful about how consumers perceive the company's motivation and study the customer knowledge regarding the topic (Bronn, Vrionni, 2000; Barone et al., 2000).

The truth is that the line between altruism or exploitation is blurred (Berglind, Nakata, 2005), according to File & Prince, the "debate continues over the relative balance of self-interest and self-lessness" (1998, p.1537). It's difficult to discover the real reasons why companies choose to adopt this marketing tool, but

according to Folse et al. (2014), advertisers have expressed interest in the persuasiveness of this marketing tool. Could be due to the realization of the benefits that can derive from CRM (Demetriou, et al., 2010) such as “enhancing the image of their company”, product promotion (File, Prince,1998, p.1531) or increase sales (Nowak, Clark, 2003), to achieve economic and social objectives (Ross, et al., 1991), to demonstrate their “responsiveness to society’s heightened expectation and demands for responsible corporate behavior” (Demetriou, et al., 2010, p.288), because managers are feeling pressured to tie their philanthropic activities with corporate strategies to improve overall performance (Webb, Mohr, 1998); because a firm’s performance is being judged on the impact it has on the environment and society (Sheikh, Beise-Zee, 2011), or even because “CrM allows corporations to benefit from their philanthropic investments by combining charitable contributions with innovative marketing techniques” (Ross, et al., 1991, p.58)

From the company’s perspective, even though this type of marketing is not the easiest to communicate, it is usually cheaper and more easily adjustable to different customer targets (Sheikh, Beise-Zee, 2011). In addition to the cheapness and targeting flexibility benefits, authors like Till and Nowak (2000) and Vanhamme et al. (2012), take this subject to a higher level and justify the adoption of CrM due to two distinct approaches: tactical, in which the ultimate purpose is to increase “revenue through the improved effectiveness of the profit base organization’s sales promotion efforts” (Vanhamme et al., 2012, p. 261) or strategic, which consists in a long term focus on improving the perceived corporate image on consumers’ minds.

Ultimately, even if not conducted entirely for the “right” reasons, CrM still gives everyone involved the possibility to help those in need, benefits the elected cause and the company, elevates consciousness about others’ needs, helps developing a more compassionate marketplace and motivates social responsibility among businesses (Berglind, Nakata, 2005).

Despite the fact that we don’t know much on how organizations “balance philanthropic motivations with those of corporate self-interest” (File, Prince, 1998, p.1530), and at which percentage each contributes to the use of CrM, because there isn’t a lot of research on the company’s perspective about it (Bennett, 2014), according to Demetriou et al, (2010, p.266), the number of corporations realizing the benefits of CrM is increasing: companies are now “adopting it as marketing tool to achieve their marketing objectives, by demonstrating commitment to improving the quality of life in the communities in which they operate”, and CrM is gaining popularity as promotional tool between managers and fundraisers. According to Varajadan and Menon (1988), factors like proximity, time frame, consumer’ personal characteristics, level of association, choice of the cause and geographic scope influence the impact of CrM campaigns.

Considering that the tendency is for CrM campaigns increase in the future (Bednall et al. 2000), authors like Smith, Higgins (2000) call the need to further analyze the social context in which CrM emerge and evolve.

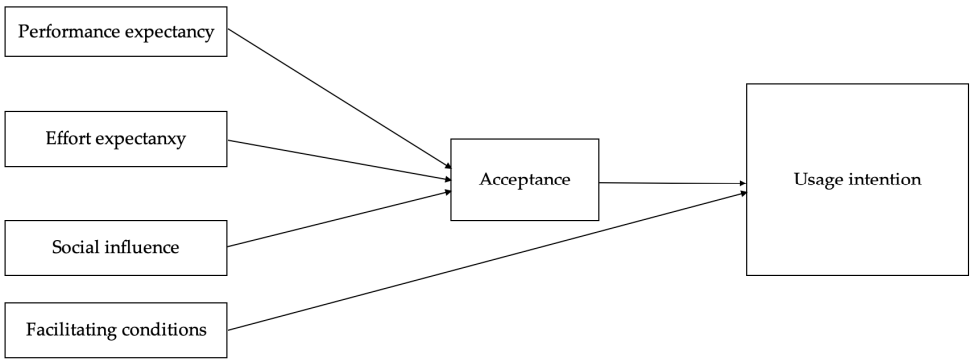
Are managers ready to adopt CrM?

In order to analyze this subject, surfaced the need to elect a model to guide the development and interpretation of the collected in-depth interviews. After analyzing several different models, we selected the UTAUT model - Unified Theory of Acceptance and Use of Technology (developed by Venkatesh, Morris, Davis and

Davis, 2003). Being a model that unifies several different models in the development of a new, more extensive and complete one, having under analysis a wider range of variables, UTAUT seemed the best approach. Using this model as a guideline this research analyzes what managers think about CrM in terms of acceptance, intention and use: understanding if they accept it as a viable option, if intend to implement it and if they used, use or consider using it in the future, by evaluating what managers' think of CrM in terms of performance and potential, effort to develop and implement, their opinion regarding what the ones involved in the company environment would think about it and which conditions do they have, or don't have, that could facilitate the acceptance and use of this type of marketing.

This model, which integrates different variables analyzed by eight different models, to "assess the likelihood of success for new technology introductions and helps them understand the drivers of acceptance" (Venkatesh, et al., 2003, pp 426), consolidates numerous different variables into four core determinants that determine the degree of acceptance, intention and usage: performance expectancy, the degree to which the potential user believes the acceptance and use of this new tool will improve his or the company's performance, effort expectancy, which measures the perceived degree of easiness to use said tool, social influence, degree to which the individual perceive that relevant others think of the use of the new tool or system, and facilitating conditions, described as the degree to which the individual believes that the organization already has pre-existing conditions to facilitate the implementation of this new tool – figure 1 (Venkatesh, Morris, Davis and Davis, 2003). Even though in the original version proposed by Venkatesh, Morris, Davis and Davis, the authors linked these four constructs with four moderating factors: age, experience, gender and voluntariness of use (Alkhunaizan and Love, 2012), it was believed to be better not to considered them in this research due to the reduced size of the sample under analysis.

Figure 1. UTAUT Model and the four variables



Another reason why the UTAUT model was believed to be a good approach to analyze this topic was due to the linkage between the four variables and some of the factors addressed on the literature review. It is possible to examine and explore these variables, based on the previously existent work. Adapted to this particular concept of CrM the model variables have different parameters than the ones used to interpret the acceptance and usage of a new technology.

In this specific context: performance expectancy is contextually related to subject's interpretation on the potential of CrM, positive or negative, more specifically benefits or risks that can derive from the implementation of this type of marketing. Benefits such as enhancement of the company image, product promotion, increase of loyalty or growth of sales, and risks such as hurting the firm reputation, repelling effect on members non-supporters of the elected cause or reduction in the relatedness and affinity with the company are some of the factors expected to analyze under the performance expectancy variable.

The variable effort expectancy is, on the other hand, linked with the effort necessary to develop a campaign of CRM: the obstacles and barriers that managers and firms have to overcome in order to successfully implement this type of marketing will be stated and evaluated according to the perceived demanding effort. Considering the studies analyzed in the literature review, the main efforts to overcome are the pre-established skepticism and criticism towards CrM, the fact that is a difficult type of marketing to communicate and requires cautious planning and monitoring.

The variable social influence is directly connected to the opinion of everyone involved on the company's environment: costumers, shareholders or administrative and coworkers. On the literature review it was only possible to assess the possible feedback from the client about CrM, and the fact that this marketing tool usually improves employee's morale and benefits their opinion about the firm. More is expected to be explored in the conducted interviews concerning superiors and shareholders perception.

Lastly, the variable facilitating conditions is linked to all the conditions that can enable or simplify the effective implementation of CrM: a long-term approach, transparency and full commitment, are some examples of facilitation conditions mentioned on the literature review.

3. Methodology

Considering the shortness of previous empirical researches on the field of CrM (Bennett, 2008), there is the need to develop exploratory studies with the intent to further understand manager's perspectives about this type of marketing. Following the example of a study conducted by File and Prince (1998), respondents were screened to be individuals responsible for marketing and/or decisions involving Corporate Social Responsibility within small, medium size or multinational enterprises. Enquiring managers of different size firms would be recommendable to assess the way they understand thus type of campaign, regardless of the size of the firm. For that reason, six directors of marketing departments were contacted to be a part of this research and be interviewed in about this topic. For additional context, respondents were leaded to an established definition of CrM to assure consistency within the topic and more reliable results. The interviewees ranged from 32 to 52 years old, 66,6% woman and 33,3% male. The in-depth interviews were conducted on January 2019 trough skype. None of the interviewees had any time restrictions and their duration varied from 25 to 58 minutes. All interviews were entirely recorded and transcribed, with the participants consent.

The interview questions (see appendix) were developed based on the Venkatesh, Morris, Davis and Davis (2003) approach on the subject but adapted to the topic under analysis: to evaluate marketing managers perspectives concerning the four main constructs of the UTAUT model. Questions aimed at understanding the performance expectancy that managers perceived of this marketing tool, at

assessing the effort expectancy associated with this marketing tool, and at interpreting marketers' perspective concerning the social influence of everyone involved on the trade process. Lastly there were questions whose purpose was understanding if the gathered conditions facilitated or hinder the implementation of CRM. It was expected the construct "social influence" to have a higher impact on acceptance and use of CrM, because of the social component of this marketing tool. The proposed model was meant at assessing the potential acceptance and use of CrM campaigns, evaluating what do managers think of this marketing tool expectancy regarding performance and effort, if and which facilitating conditions are considered prior to the implementation of CrM on the corporate environment and social influence of consumers, shareholders and employees.

4. Analysis of the results

Considering the proposed model, UTAUT, in-depth interviews analysis was conducted based on the four core determinants previously mentioned: performance and effort expectancy, social influence and facilitating conditions, with the final intent to measure the level of acceptance and usage of CrM.

Performance expectancy

As more common outcome from campaigns using CrM, participants stated several benefits for the company: the association to the idea that the firm is socially responsible and take on an active part on society matters, the consequent growth of the value of the brand, the increase of brand awareness, the improvement of the brands' image and reputation, differentiation from its competitors with more average positioning, and higher possibility of engagement with the brand from more supportive and loyal customers (Interviewee 1).

However, like everything, this marketing tool has its pros and cons, and presents numerous risks that might emerge if the cause is poorly chosen, one of the parts is in it for selfish purposes or dubious motives, or if the consumer perceives a CrM campaign as a "commercial maneuver" (Interviewee 3). This represents a bigger risk nowadays due to the size and reach of media, which can suspect, investigate and discover less altruist motives and rapidly leaks information as such, which will, consequently, have a massive impact on the brand's image. On this matter, Interviewee 2 demonstrated real concerns:

"Specially now, with the coverage, reach and easiness of spread, a campaign with a delicate topic can be a risk because one bad move and the media will blow bad news out of proportions very fast and in an uncontrollable way to hurt the company. We've seen this happen with several companies."

As more damaging risks for the company, the following were mentioned during the interview process: badly damage the firm's image and reputation, being perceived as fake and misinterpretation from consumers, seeing the adoption of CRM lead by exploitive and self-interest reasons. All these risks can develop a general disbelief and distrust against the company, which will lead to loss of loyalty, consumers and consequently, sales. Interviewee 6 noted

"From my perspective, one of the major risks is costumers understanding the campaign as exploitive and a trivialization of CrM"

Even though the Interviewee 6 is a firm believer that “consumers can notice when a brand is being authentic or fake and exploiting a cause to self-promote” this was not the general opinion that other interviewees expressed: they often mentioned the skepticism of consumers towards these types of associations when coming from companies, due to brands usually being concerned with their own goals. Interviewee 5 specified that “consumers don’t know to which extent brands are being genuine or not.”

All interviews admitted that if right set of conditions were gathered CrM has a massive potential (Interviewee 5) in terms of performance and can really elevate the company in the eyes of consumers and increase the company’s value. Obviously, none of the respondents identify this as the ideal type of marketing to implement when the goal is to quickly increase sales. Interviewee 6 acknowledge “If the goal was to increase sales, we had other ways, more immediate to achieve it, for instance to do a 60% off campaign.”

It was general agreed that managers engage in CrM for the qualitative factors instead of quantitative (Interviewee 6): the goal is to benefit the company in different ways then numbers, improving the firm’s image, corporate morale, affection towards the brand and/or product, preference over competitors, among other qualitative issues. Proving this statement Interviewee 5 affirmed that“what we are expecting - from a campaign like this - is reinforcement on loyalty and reputation levels.”

Even though increasing sales is not the main objective of companies when they choose to implement CrM, by participating in campaigns like this and concerning them about sustainability, this is always the ultimate goal for every company. Interviewee 4 confirmed that “We place social purpose before sales goals and at the same time by doing so, we reassure that sales are guaranteed.”

Effort expectancy

In terms of effort expectancy, only one of the participants had the opinion that CrM didn’t implied a lot of effort and classified this type of marketing as easy to implement, justifying her perception with the fact that, usually, the cause is glad to accept all help, which really facilitates the mediation process by removing the discussion of values out of consideration. According to Interviewee 6 “usually these campaigns are relatively easy to implement because normally we are dealing with causes or association with whom we don’t discuss values or negotiate with.” Also, interviewee 6 argues that CrM opens access and facilitates the implementation of campaigns with a heart. The company simply places the offer on the table, try to identify common aspects between the company and the cause and move forward, because for causes everything a company has to offer is more than welcome. Even regarding advertising and communication, interviewee 6 believes that this type of campaign simplifies the procedure: “Media corporations often want to advertise initiatives like this for free”.

The other five interviewees had the opposite opinion as they classify CrM as more complex, difficult and laborious, when in comparison with more traditional types of marketing, as implies more planning, controlling, delicate topics and legal and administrative issues. Interviewee 1 detailed, when asked about easiness of planning and implementation of a CrM campaign: “it's way easier to place a commercial on tv or create a campaign for people to sample our products than to talk to the association and develop a partnership, and all these things have a lot of legal and administrative issues and take months to plan and execute.”

Even Interviewee 6, that characterized CrM as easy to implement, agreed that it demands the development of a full and complete evaluation not only of the plan but also of the cause as well, as it is necessary to comprehend every aspect involved concerning the cause: the vision, mission and values of the cause and everyone working on it, true intentions, motives and origins. Interviewee 3 shared the same concerns about the complexity and demanding analysis of the cause stating that "Is fundamental to understand who's working there, what's their records and history, as well as to do a little research and investigation to understand the seriousness and credibility of our potential partner. That's the reason why the managers advocate that this marketing tool demands a much bigger effort, especially in hours devoted to it, because it requires study, and an understanding of everything that needs to be done and how, alongside with a constant analysis".

Agreeing with the literature, all subjects interviewed agreed that a detailed monitoring of the process is decisive to the success of CRM because campaigns like this obligate firms to do a lot more of adjustments, even during the campaign, in order to reach a bigger impact and achieve the set goals. Considering the fact that CrM implies a serious commitment of everyone implicated, this is overall a more long, complicated and demanding method, especially when compared with more conventional types of marketing (Interviewee 5).

After conducting a campaign like this Interviewee 3 highlighted the need and importance of focus of the proposed campaign to the target audience, as she felt that, when she implemented a CrM strategy, it did not receive the expected adhesion, because the selected cause didn't feel close to consumers. Her and her colleagues felt that even though they defined the cause and explain the motives, consumers couldn't relate to it enough to care, contribute and take action. Interviewee 3 noted that "we explained which was the cause and who were we helping but the recipient was always too far way. And I got the impression that at least a lot of Portuguese still had that mindset that made them think: - they're trying to help someone in other continents or countries who we don't know, when there are so many people in need here".

When choosing the bigger challenge the participants couldn't reach an understanding: Interviewee 3 mentioned the choice of the cause, which implies an immense amount of research and careful commitment; Interviewee 6 elected the construction of a CrM plan for a long term and not a one-time thing, Interviewee 1 stated the correct communication of a campaign like this, every word matters in this context, Interviewee 4 choose the continuity, consistency and the fact that is long-term, for Interviewee 5 is to know to which extent do we have freedom to involve our partners during the development of campaigns as such, the margin that we have to communicate with and about them can be a challenge (especially when we are dealing with causes that have a lot of politics involved), and lastly Interviewee 2 nominated the bigger challenge the fact that as this concept is not very known maybe this type of mkt is difficult when compared to other types and more complex also because it's a concept very specific that deals with some skepticism already established and implicates a more thought, careful and rigorous implementation due to the fact that this is a very delicate and sensitive topic and can rapidly have a negative impact for the company. But overall, all respondents agreed that CrM has a lot of rules, barriers, things to look out for, and more than two also mentioned the choice of the cause and the coherence and consistency needed in CrM as big challenges to overcome.

Social Influence

As almost every participant interviewed had already participated on a campaign of this kind, they already had feedback from previous campaigns regarding the opinion of others about CrM campaigns. Basically, all the answers to the questions concerning the opinion of consumers, shareholders or administration and coworkers about CRM started as “Assuming that…” followed by one, or more, of the facilitating conditions enumerated bellow for a campaign of this kind to succeed.

Except one interviewee, the other participants stated that they believed that in the eventuality of their company implement CrM, their target audience response would be extremely positive (Interviewee 6), or admitted expecting a good reaction (Interviewee 3), and not at all believe their consumers would perceive it as opportunism (Interviewee 2), mainly because the consumers are already aware of the values that the company stand up for and this wouldn’t appear as something completely unrelated to the firm's’ core. Interviewee 1, with a different perspective, expressed her concern “I think that, in some cases, costumers are already a little saturated with this type of campaigns because they - usually- don’t believe in the good will of brands and companies, and very often aren’t willing to pay more or chose that product over another just to give or contribute to something to someone they don’t know”
And she even added that “unfortunately, consumers are still very self-centered and prefer immediate discounts over these types of campaigns.”

In addition, Interviewee 3 mentioned that, after the experience she had with CrM, they drifted apart from that specific model, not abandoning it completely, but stepping away from it because she and her colleagues got the impression that several consumers felt like the company could help with it own money, instead of demanding the contribution of the final consumer to help others. She stated “We felt that in this particular model (...) the number of consumers that interpreted these campaigns as ‘if the brand wants to help the cause a, b or c it can, but not with my money’ was increasing”. Overall Interviewee 3 confess that she simply felt like “consumers expressed a better reaction if the brand helped directly”. Moreover, this interviewee assumed to believe that because the firm is a multinational, consumers know that the company is financially capable financial and react differently than if it came from other companies, smaller in size and profit amount.

Regarding the opinion of shareholders or administration towards this type of campaign, all six interviews agreed. As the additional value of the brand is an increasingly concern of companies, more and more leaders are becoming extra aware and want their brands to be sustainable and helpful, not necessarily with a partnership with a cause but something full time that makes the difference (Interviewee 4) and they can realize the real advantages that CrM can have to the firm’s image. Interviewee 1 and Interviewee 5, respectively, noted that “They really see this type of campaigns with very good eyes”.

Regarding their co-workers, interviewees also concur that they would have a positive reaction toward CrM, justifying their opinion with the fact that we are all people and we all have an internal desire to do the right thing and make a different “They can understand how CrM can really value their assets and has several advantages that can represent to a company being permanently linked with solidarity purposes” or contribute to something bigger than us. Interviewee 4 mentioned that “At the end of the day they are consumers as well and live the same problems as other consumers.”

Interviewee 2 even goes the extra mile and state that his coworkers would be excited to be a part of a campaign like this according to what he knows from them: their values, their education, themselves.

Expecting positive reaction from everyone involved in the process is extremely encouraging and can lead more companies to accept and use CRM, but obviously it is important that all the conditions to succeed are gathered and its better if the company implementing CrM is already known for their values and principles, as this facilitates the acceptance of the campaign as honest and helps to decrease the pre-existing skepticism.

Facilitating conditions

Practically as a general rule, every participant agreed that companies can truly benefit from CrM when planned, implemented and constantly monitored correctly, depending on the sector and assuming that the company, products, or brand, adopting CrM already have a certain level of affection or loyalty associated to it. Interviewee 3 declared regarding her previous involvement “In my experience, this type of toll works better for products with some level of attachment and loyalty.”

In order to prevent the previously stated risks from happening and as a way to fight skepticism the interviewees identified several crucial conditions that would facilitate the planning and implementation and would increase the chances of successfully adopting CrM:

a) plan and implement a very consistent campaign on medium and long-term, because campaigns like this only work if the company really invests on it consistently and during a long period of time, for clients to understand that the company really cares and it’s not simply another campaign. No repercussions will be felt on short-term (Interviewee 4). On this topic Interviewee 3 affirmed that “The result will depend on the consistency (...) as doing it once and neither repeating it, nor implementing an appropriate communication campaign will lead to a very small impact on short-term but in long-term the impact will be null”. Thus, it is advised to study the possibility of implementing a campaign of this kind applied on medium or long-term, as there is no reason to engage in something like this to do once and for a short period (Interviewee 6);

b) choose a topic linked to the core of the company and try to innovate, but always supporting the elected first related topic. Consistency is extremely important for the consumer to develop the association between the brand and the cause (Interviewee 5);

c) have real and transparent relation with the cause, truly investing and devoting time and commitment to it. As Interviewee 6 and Interviewee 5, respectively, noted: “It’s critical to have a genuine connection with the cause and continuity in the support … I consider fundamental feeling and being completely committed to them”.

d) believe on the cause and “everything about it” (Interviewee 4);

e) be careful not to make these campaigns something trivial and face them with the necessary seriousness (Interviewee 6);

f) choose an organization that is reliable, in order to prevent extra risks and damages related to this partnership. Interviewee 6 advised: “The elected cause should be believable and trustworthy, because we wouldn’t want to associate with a cause that later on will generate a scandal or is exploiting the partnership for less noble causes”.

g) select a cause that consumers value and its close to them and, more importantly, a cause that consumers can easily understand why the link with the organization. The fit between the cause and the company, as well as core values and vision are fundamental to decrease skepticism, make the campaign more believable

and trustworthy, and facilitate acceptance, comprehension, and support towards the association among both parties involved on consumers' minds. Interviewee 3 and Interviewee 6 mentioned that: "It is very important that congruence exists between the companies' and causes' objectives and values … In order for CRM to work we need to have good affinity between the brand and the cause, something that connects well".

h) have a well-established partnership (Interviewee 1), where transparency, honesty and communication are crucial, and listen to everyone involved because it can really help adjusting and improving the plan (Interviewee 5);

i) lastly, because CrM campaigns are already predisposed to skepticism and critics and considering the, usually, delicate topics approached, develop a thoughtful and well defined communication strategy to assure no exploitation or misinterpretation from neither side. The way that the campaign is communicated and advertised can be determinant to its success, due to sensitivity and delicacy of the subject (Interviewee 4). In the same context, Interviewee 2 recommended: "To carefully control all publicity and communication regarding the campaign"

At the same time, to invest in communication so everyone knows what's being done and why (Interviewee 5) and value the follow up from everyone involved in the campaign: considering all perspectives will help to create a better campaign. Marketing Manager Beauty and Care at Unilever Fima, Interviewee 3 noted that: "the disbelief of consumers sometimes come from never seeing the realization of the help they provided and was promised. It's very important the before, the during and the after and sometimes brands forget (...) it's crucial to show the realization, the proof."

Aside to the essential conditions to succeed, marketers were questioned regarding the resources they believed were crucial to implement a CrM campaign. Only two types of resources were identified as necessary to develop a CRM campaign: human and financial, and every participant admitted that the company where they worked at had those resources available, even if it was necessary some adjustments. Still according to Interviewee 3: "it's necessary for people to relocate and focus the resources to do things that really matter"

Considering that this marketing tool requires hours of research and a constant monitoring, this would imply to have someone fully devoted to this project, because it involves a lot of conversations with the cause, numerous meetings with the administration and demands a full communication plan (Interviewee 1) so human resources are "the main resources needed" (Interviewee 3).

Interviewee 6 highlighted that more than available human resources, it's necessary people who are motivated and dedicated, trust, believe and cherish this type of initiative: "To be involved in these campaigns we need people who believe in this project and want to take it further with the right energy for the project to succeed and achieve the desired dimensions"

Additionally, financial resources are also mentioned as important but not crucial, as this type of campaign is not considered expensive. Interviewee 2 noted that "In my opinion, CrM is not very demanding in terms of monetary resources" Money is simply necessary to invest on advertising and other matters that might appear, because due to the fact that the established partnership is almost always with a non-profit organization or cause, this will imply that all cost fall on the responsibility of the company. "Usually causes don't have the resources, so the sponsorship, promotion and communication will all be a responsibility of the brand (Interviewee 1)".

Other factors that might be considered facilitating conditions are:

- the fact that there is an increasingly concern from consumers and brands regarding social responsibility, because this represents a reason for this type of marketing to be implemented and accepted more easily;
- the fact that managers and marketers are aware of what it takes to develop a campaign like this and are aware of the risks;
- and the fact that managers expect good responses from their target audience and have complete support from their supervisors to implement campaigns like this.

In order to better comprehend and consolidate the more relevant information withdrawal from the in-depth interviews on each of the four variables under analysis the following table was created (see Table 2).

Table 2. Most common answers regarding each one of the four variables under analysis: performance expectancy, effort expectancy, social influence and facilitating conditions

Variable under consideration	More relevant factors to consider in each variable		Number of respondents to mention the following factors
Performance expectancy	When planned, implemented and monitored correctly	Massive potential	6
		Improvement of the brand's image	6
		Increase of loyalty and affection for the company	4
		Increase of company - qualitative- value	5
		Differentitation from competitors	3
		Growth of sales in the long-term	4
	When not	Presents several serious risks for the company	6
		Can damage the company image	5
		Can lead to loss of clients and sales	6
Effort expectancy	Easy to implement		1
	More complex, dificcult and laborious to implement		5
	More demanding than other traditional types of marketing		5
	CrM demands a detailed and carefull approach: planning, implementation and monitoring		6
	Full comittment from both parties involved is necessary		6
Social influence	Great feedback from shareholders and administration boards		6
	Positive opinion and willingness to help from coworkers		6
	Expectancy of good feedback from target audicence		5
Facilitating conditions	Honesty and transparency		6
	Consistency		5
	Long-term		6
	Fit/congruency between the company and the cause		6
	Election of a cause to which consumers feel close to		4
	Full comittment from both parties involved		6
	Human resources are the crucial component		6
	Low financial resources needed		4

5. Discussion

Consonant with the literature, marketers see the increasing importance of developing campaigns with a heart, linked with something that consumers feel close to. After analyzing the collected data is safe to affirm that CrM is very well positioned in the mind of marketers. Using Venkatesh, Morris, Davis and Davis (2003) model, it is possible to confirm that this marketing tool is considered by managers. The data collected allowed us to infer that, except for the effort performance, all the other perspectives under study are used in the decision making process of managers, when developing a CrM campaign.

The idea that CrM campaigns involve a lot of effort, especially when comparing to other types of campaigns, can be regarded as the reason why this tool is not more used. In fact, even though managers realize the “massive potential” of this kind of marketing, expect incredible feedback of CrM from everyone in the company environment (shareholders and administration, coworkers and most importantly the target audience) and seem to have the resources and other factors to help implement this type of campaign, they tend not to invest more in it.

With the intent of responding the question regarding if the managers are aware of what to take into consideration when planning a CrM campaign, the information taken from the interviews indicate that managers do know which factors are crucial to conduct a successful CrM campaign. In conformity with evidence from previous studies (Bhattacharya, Sen 2004), the interviewees mentioned the same or similar factors: the importance of long-term, consistency, coherence and fit between cause and firm core values and lastly careful planning and monitoring of the process – campaign and ways to advertise it.

Regarding the performance expectancy it was clearly visible that the participants saw the numerous benefits that CrM presented. From an early stage it was relatively easy to understand that the performance expectancy would be one of the biggest drivers for the acceptance and user encouragement of CrM. Agreeing with the findings of other authors, cited on the literature review, interviewees mentioned as main advantages for the company: the association to the idea that the firm is socially, consequent growth of brand value, increase of brand awareness, improvement of the brands’ image and reputation, higher possibility of engagement and loyalty, differentiation from its competitors and increase in the choice over its competitors.

Also further proving the validity of the studies analyzed in the LR, the conducted interviews allowed to access CrM in terms of facilitating conditions. All interviewees agreed that some financial resources are in fact needed but not in a greater amount, as this type of marketing is usually cheaper and implies less monetary investment. Mentioned as indispensable and crucial where human resources, people that truly believed and were excited with the campaign: to plan, implement, develop, monitor and evaluate it. In a general manner, applicants concluded that basically every company has the resources needed as long as there is will-power to create adjustments in case they’re necessary. The relative easiness to possess the necessary resources, partnered with the expectance of positive outcome, the existent increasingly concerns from consumers and brands regarding social responsibility and confidence of managers on their knowledge to pull-off a CrM campaign, lead me to conclude that marketers have gathered all the

conditions necessary to facilitate the adoption of this type of marketing, which can incite the usage of CrM according to the model.

Even though in the literature several authors described the majority of consumers as very skeptic and critic (Kim, Lee 2009), most respondents acknowledge that possibility and risk as features to overcome, but also believed that in the event of their company implement a CrM campaign, said campaign would be well received and accepted by consumers, coworkers and shareholders, because they trust that they know what it takes to succeed, how to avoid the obstacles and prevent the risks. This perspective regarding the opinion of orders allows concluding that the social influence, in this case, will facilitate the acceptance of CRM, according to the UTAUT Model.

Described by both, well-known published authors and the respondents inquired for this research, as not the easiest type of marketing to implement and communicate, the expected effort associated to CrM is high, especially when compared with other types of marketing, which will difficult the acceptance and resulting usage of this marketing tool. The majority of the interviewees characterized CrM as challenging to plan, considering all the variables, risks and obstacles involved. They classified it as very complex and demanding, implying constant updates, monitoring and control to prevent damages to the company.

In order to respond the main research question of this study, regarding what managers think about CrM: we can determine that managers think highly of CrM, see an amazing potential on this marketing tool and are fully aware of both benefits and risks of it, as well as elements needed to implement a CrM campaign. However, in terms of effort necessary to overcome the skepticism, critics, risks and obstacles this type of marketing loses points.

Was noticed that marketers mentioned a lot more the importance of doing good, participating in initiatives, organizing campaigns with good values and positive messages or contributing in another ways, etc., instead of strictly partnering with a cause, demanding the intervention of the client on the process to donate something. One of the interviewees even doubted the worthiness of CrM, advocating that the importance of adapting and meeting costumers' expectations towards corporate social responsibility doesn't strictly imply a partnership with a cause – and the risks involved – merely implies commitment from the company to be sustainable, support causes or initiatives and do good. Marketers consider crucial for a brand to care, to be sustainable and to support what it truly believes but something more as "adopting a stand to contribute to a sustainable ecosystem" as a way to adapt and remain relevant, "it has to be something that the company is, not something that the company does" (Interviewee 4).

6. Conclusions

Mainly used to improve the image that consumers have about the company, change consumer behavior toward the brand and increase the loyalty between consumers and brands, CrM also presents several obstacles that can interfere with the success of it: challenging and complex planning and implementation, risk of consumers interpreting this type of marketing as exploitive from the causes' side, which can hurt the firm's reputation and the possibility of being linked to a determined cause that later on will damage the company's' image.

The purpose of this research was to discover managers perspectives about CrM: what managers think about it, if they are aware of the existence of CRM as a marketing tool, what do they think about the potential success of CrM campaigns, if they know which are the required elements to implement this type of marketing tool and which advantages might result from this implementation and which are the factors they consider obstacles or barriers when considering the adoption of CrM and which they consider relevant to succeed.

Based on the UTAUT model the main findings of this study show that in terms of performance expectancy and social influence, CrM is easily accepted by marketers, which will increase the probability of use, alongside with the admitted existing facilitating conditions. Unfortunately, in terms of effort expectancy, managers believe that the effort that CrM implies is high which will decrease the level of acceptance of CrM and consequently diminish the its probability of usage.

After examining the research, is possible to affirm, based on the conducted interviews, not only are marketers aware of this marketing tool as they are very well informed regarding it: they know the risks, the obstacles, the advantages and potential, as well as what are the criteria to adopt to successfully implement a CrM campaign. And even though they all see potential, admit having the necessary resources and presume they would have a positive reply from their company environment, they assumed being currently on campaigns also linked with values, socially responsible or sustainable and without ruling CrM out as a possibility, don't see the need to be linked to a specific cause to show to their audience that they care.

Theoretical contributions

Building on the literature review, managers comprehend the tremendous potential of CrM, assuming that when all the conditions to succeed are carefully followed, this type of marketing can truly benefit everyone involved: the company, the cause and the final consumer.

Interviewees mentioned the importance of congruence between the values defended by the firm and the cause, with the intent to facilitate the consumers' association and comprehension of this created link, which sustain the numerous studies and researched that exist highlighting the importance of fit between the cause and the company.

This research also showed that marketers might attribute more value to the act of a corporation being socially responsible than restrictively to establish a partnership with a cause. Due to the already mentioned increasing concern from consumers to be more socially involved, there are now several marketing types that help companies to improve their image and reputation, increasing loyalty and brand affection, that might not present as many difficulties and effort for managers.

In terms of the variables analyzed, even though CrM is perceived as complex and challenging regarding the effort expectancy, is also perceived has extremely beneficial and socially accepted – when the conditions, previously mentioned, are met. This indicates that in terms of acceptance, the effort expectancy is the only variable that difficult the acceptance and consequential usage. If the effort would be less, this would conduct to more companies implementing CrM as a marketing strategy.

Managerial contributions

As attentions are currently focused on firms, to comprehend their social impact, is very important that managers, or marketers, before implementing a CrM

strategy, really think about the impact that they intend to achieve with this marketing tool in the long-run, and, accordingly, define a detailed plan to do so.

As formerly indicated is vital that marketers know how to do it, in order to prevent the risks and negative impact that can originate from CrM. To succeed using CRM, this must be thought always in a long-term perspective, be transparent and trustworthy, both implementation and communication strategy should be carefully planned and analyzed, and the elected cause should be cautiously chosen, preferentially completely aligned with the company's core values, due to the impact that will reflect on the brand.

Considering that, of the four variables under analysis on this topic, to evaluated the acceptance and usage of CrM – performance expectancy, effort expectancy, social influence and facilitating conditions, managers principal issue with CrM lies on the effort perceived to develop a campaign of this kind, it seemed relevant to advise that this type of marketing might increase in worth if the client really appreciates the campaign and understand it not as the company only contributing if the client purchases anything, but as the company having interest in involving him the process, motivating him and facilitating the act of giving for the final consumer.

Limitations

The present study faced several limitations that affected the data interpretation and that, therefore, should be taken into consideration. On a first instance is important to mention the subjectivity of the theme under analysis. As this study is based on interviewees' personal opinion, the results will vary according to the interviewed individuals and common ground was found but not regarding every aspect. Second, the reduced size of the sample didn't allow a representative analysis of the population. Third, this study was conducted only based on Portuguese marketers, which implies that the reached findings might not be applied to different cultures, due to cultural differences. Forth, and lastly, the demographic characteristics of participants, especially in terms of age and gender – considering that the majority of interviewees were female-, do not possess a wider range in scope to generalize the findings to the population.

Future research guidelines

After conducting this study, several guidelines for future research emerged as they seemed interesting and relevant to contribute to the development of this under-explored subject of CrM, from the perspective of marketers. Due to the first and second limitations mentioned above this wasn't a viable option in the present research, but it would be valuable to explore how genders and age influence perspectives about CrM: changing their stand, claims and concerns.

Another distinct approach on this topic would be to analyze the different opinions of marketers according to the several types of companies. Apprehend if size, profit, employee number and brand recognition are variables that influence marketers' opinions, as well as to comprehend the impact of each variable.

Still from managers perspectives, and as well from consumers' point of view, it would be noteworthy to understand if the opinion regarding CrM differ from B2B to B2C companies, and if so, how and why.

Lastly it would be beneficial to compare CrM with other types of marketing also based on Corporate Social Responsibility, its impacts on consumers and regarding usage and acceptance from managers. The purpose would be to apprehend if in comparison other types of marketing, these can provide the same advantages without the potential risks of CrM.

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APPENDIX

Interview template

Dear Participant, I am, at the present mean, collecting data for the University Católica Portuguesa, Católica Porto Business School, on CRM: from the firm perspective. My purpose is to collect data and information that allows to analyze the topic under the corporation view. All the collected information will be used exclusively for research purposes and will be used anonymously and released in aggregated terms, unless the firm explicitly authorize it. With this study I intend to gather information to better understand what managers think about the type of marketing under analysis: analyzing the degree of acceptance and usage of CrM. I acknowledge and thank you cordially for your support and availability to help and underline that every participant can intervene with any question or concern that seems appropriate. In case you have some doubt regarding this project please communicate at the time of the interview or later, by email.

1. Are you familiarized with the concept of CRM is?
2. Tell me, in your own words what is CRM.
3. Do you ever work with this type of marketing?
4. If yes, what did you thought about it?
5. If yes, mention, in case they existed the problem(s) your firm faced when implemented this type of marketing.
6. If not, do you think that the company where you currently work would benefit from a campaign like this? And why?
7. What is the potential you see on this marketing tool? (performance expectancy)
8. What do you think is the most common outcome for a CRM campaign? (performance expectancy)
9. What benefits do you believe, the implementation of CrM, might have for the company? (performance expectancy)
10. Which, do you believe, are the downsides or risks of CrM? (performance expectancy)
11. Which, do you believe, are the bigger barriers or obstacles of CrM? (performance and effort expectancy)
12. According to your perspective on the subject which do you believe are the factors that contribute the most for the success of a CrM campaign? (performance expectancy)
13. As a marketing manager, what do you think about this type of marketing in terms of planning? (effort expectancy)
14. And implementation? (effort expectancy)
15. What do you believe is your potential consumers opinion regarding CRM? (social influence)
16. How do you believe your target audience would respond to a CrM campaign? (social influence)
17. What do you believe would be your shareholders opinion if your company adopted this marketing tool? (social influence)
18. And regarding your coworkers? What do you think would be their feedback? (social influence)
19. Are you informed about which are the required resources to implement this type of marketing tool? (facilitating conditions)
20. Considering your marketing department, does your company have the necessary resources to implement this type of campaign? (facilitating conditions)

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IDENTIFYING KEY FRAUD INDICATORS IN THE AUTOMOBILE INSURANCE INDUSTRY USING SQL SERVER ANALYSIS SERVICES

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Abstract.
Customer segmentation represents a true challenge in the automobile insurance industry, as datasets are large, multidimensional, unbalanced and it also requires a unique price determination based on the risk profile of the customer. Furthermore, the price determination of an insurance policy or the validity of the compensation claim, in most cases must be an instant decision. Therefore, the purpose of this research is to identify an easily usable data mining tool that is capable to identify key automobile insurance fraud indicators, facilitating the segmentation. In addition, the methods used by the tool, should be based primarily on numerical and categorical variables, as there is no well-functioning text mining tool for Central Eastern European languages. Hence, we decided on the SQL Server Analysis Services (SSAS) tool and to compare the performance of the decision tree, neural network and Naïve Bayes methods. The results suggest that decision tree and neural network are more suitable than Naïve Bayes, however the best conclusion can be drawn if we use the decision tree and neural network together.

JEL classification: C49, C88, G22, K42;

Keywords: automobile insurance, insurance fraud, fraud indicators, data mining.

1. Introduction

Nowadays the existence of a company may depend on the quick and accurate information gathering, on the analysis, on flexible development and on the innovation. More and more senior executives realize that the Internet, and the electronic data storage can be put at the service of the company. However, the data is not useful on its own, exists a demand by the companies for that information that

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can be obtained from the data, and are adaptable to their needs. This creates a new demand, a need for a tool, which is capable to analyze raw data for information gathering purposes (Bodon, 2010). This is especially true in marketing, where due to the transformation of the conventional segmentation policy, we have to find methods, which can help us to efficiently follow today's dynamically changing preferences. The solution can be the application of data mining algorithms, as data mining means searching those connections and global patterns in large databases, which are hidden behind the great mass of data. These connections can provide valuable information about the database and its objects, and if the database is a true reflection of reality, then also about the real world (Holsheimer and Siebes, 1994).

In the case of mandatory car insurance contracts, customer segmentation is a major challenge, as several factors influence the extent of potential compensation, and thus the determination of the optimal insurance premium. Such factors include, for example, the driving experience of the person who is driving the insured vehicle, the technical characteristics of the automobile or the potential car repair service where the repair takes place. Therefore, as a first step, the customers should be differentiated (more exactly the insurance premium paid by the customers) based on the probability of causing an accident and the amount of the possible claim for compensation due to the accident, must be defined. In Romania, this differentiation depends on the age of the insured person and on the engine capacity of the insured vehicle. Although the system is currently being used, there is a growing need for other factors which could be used in the determination of the car insurance premium. One of the factors is the probability of insurance fraud.

The studies conducted recently in Australia, United States and China reflected a growth trend of costs caused by the car insurance fraud. For instance, in 2014, the British Insurers Association (BIA) investigated the increase in the number of claims for false damages, resulting that it was 18% more than in the previous year (Insurance Fraud Bureau, 2015). The fraud proportion in the car insurance sector in Romania is at least 15%, compared to the maximum of 5-10% European average, declared Thomas Brinkmann, the Friss Country Manager of Greece and Cyprus at the International Insurance and Reinsurance Forum in 2017. In absolute numbers, this means that the level of fraud reaches annually 1.7-1.8 billion RON or approximately 400 million Euros. However, at the moment, the ability to control risks and detect frauds by the insurance companies is relatively undeveloped (Abdallah, et al., 2016). In addition, losses caused by car insurance fraudsters are not just a growth in temporary losses. They also have a serious effect on the development of the insurance industry and on the determination of insurance premiums. Due to higher compensation paid by insurers, insurance premiums are also higher (Wang and Xu, 2018). For this reason, the fast and reliable customer segmentation is essential because with its help, the higher insurance premiums will be paid by the potential fraudsters.

The paper is organized as follows: In the next section we provide a description of the background literature. Section 3 describes the data and presents the tools/technologies used in this study. Section 4 describes the results of the research, while in the last section we discuss the findings and draw the conclusions of the study.

2. Literature review

Based on Kotler and Armstrong (2010) market segmentation is no other than a strategy. A strategy which based on the separation of the whole market into segments of consumers. Consumers with different characteristics or behavior and with different needs which require different marketing policies from the companies (Kotler and Armstrong, 2010). Based on Liu et al (2019), market segmentation "can help firms know more about preferences and needs of consumers and tailor different policies for targeted segments in order to improve consumer satisfaction and increase revenue" (Liu et al., 2019 pp: 3). Nevertheless, market segmentation is a continuously developing process. In accordance with Wedel and Kamakura (2012) the development of market segmentation theories is affected by two main factors: the availability of marketing data and the advances in analytical techniques. A detailed review of various segmentation methods, approaches and solution applicable in case of different consumers can be found in (Wedel and Kamakura, 2012; Huerta-Munoz et al. 2017).

Based on Green, (1977); Wind (1978) or Wedel and Kamakura (2012) are two main type of segmentation methods: the priori and the post-hoc approach. In accordance with priori approaches companies identify the number and the characteristics of segments in advance based on their prior knowledge about the consumers. This knowledge based on indicators such as geographic areas, demographic characteristics (age, sex, etc) or purchase amounts (Frank and Strain, 1972; Green, 1977; Han et al., 2014). The other approach, the post-hoc recommends the execution of the segmentation just after the analysis of market data. In previous studies a lot of different segmentation method have been proposed in a post-hoc approaches. For example Dowling and Midgley (1988), Tsafarakis et al., (2008) or Balakrishnan et al., (2011) used clustering algorithms, Han et al., (2014) used category management, Fan and Zhang (2009) applied classification and regression trees, Kiang et al., (2006) used self-organizing maps, or Liu et al., (2010) used a multi-objective evolutionary algorithms for data analysis before the market segmentation.

Following the post-hoc approaches, with the help of a data mining tool, which identify the relationship between different attribute, we try to identify the fraudster's segment.

Related work in car insurance fraud detection

One of the first and most cited methods was proposed by Phua et al. in 2004. They suggested the combination of stacking and bagging classifiers in order to detecting the fraud in car insurance. Initially the stacked ensemble selects the best classifier method from a group of base learner methods. Later, the bagging technique is used on the chosen classifier in order to analysis the oversampled dataset (Phua et al., 2004). Another approach recommended by Pathak et al. in 2005 recommends the application of fuzzy logic for detecting the fraudulent insurance claims, from a huge dataset (Pathak et al., 2005). Pinquet et al. in 2007 developed a statistical bivariate probit method to identify the illegitimate claims from a Spanish car insurance dataset (Pinquet et al., 2007). In 2008 Bermúdez et al. recommended a Bayesian dichotomous logit method, for detecting fraudulent insurance claims in a real car insurance dataset from Spain (Bermúdez et al., 2008). Šubelj et al, in 2011 proposed an expert system based on Iterative Assessment Algorithm. The method could detect the collaboration of automobile insurance fraudsters. Contrary with other solutions, the proposed method uses networks for data representation and because of this needs only unlabeled data for

processing. (Šubelj et al., 2011). In 2011 Xu et al proposed a neural network combined with a random rough subspace method in order to identify the insurance fraud in automobile industry. As a first step the model segments the dataset into several subspaces with the help of rough set data space reduction method. After this, the neural network classifier was trained by using all the subspaces. Finally, the results of all neural network classifiers trained on the subspaces are combined using ensemble strategies (Xu et al., 2011). Tao et al. in 2012 proposed a fuzzy support vector machine for detecting the fraud in the automobile insurance (Tao et al. in 2012). In 2015 Sundarkumar and Ravi developed a detection method which is able to remove outliers from the dataset. By applying this method, the imbalance effect – typically presents in car insurance datasets – can be reduced. They used two unsupervised techniques in tandem, for resolving the skewed distribution problem. Namely the two techniques are the k-Reverse Nearest Neighborhood and the One Class Support Vector Machine (Sundarkumar and Ravi, 2015). Nian et al. in 2016 proposed the use of the spectral ranking anomaly concept for fraud detection in automobile insurance (Nian et al., 2016). Later in 2016 Hassan and Abraham in order to boost the performance of existing classifiers, recommend the use of the partitioning-under-sample method on the majority class in case of the imbalanced datasets. The results show, that decision tree based algorithms performs better than others and because of this, a decision tree based model was choose to compare the various partitioning-under-sampling approaches. The empirical results show that the proposed novel model have a better performance than previously suggested approaches (Hassan & Abraham, 2016). Li et al. in 2018 build up a principle component analysis based random forest then combine with a potential nearest neighbor method and tested on 12 datasets selected from various fields. One of the datasets was a real-word car insurance dataset. The experimental results illustrate that the recommended method has a higher classification accuracy and lower variance as the standard random forest, oblique decision tree ensemble or the rotation forest methods (Li, et al., 2018). Finally, Wang and Xu suggested a deep learning model which uses Latent Dirichlet allocation-based text analytics. Based on the experimental results on a real-world automobile insurance dataset, the suggested text analytics-based framework has a better performance than the traditional one. Furthermore, the authors highlight that the performance of the proposed framework is better, than the performance of the widely used random forest or support vector machine (Wang & Xu, 2018).

3. Methodology

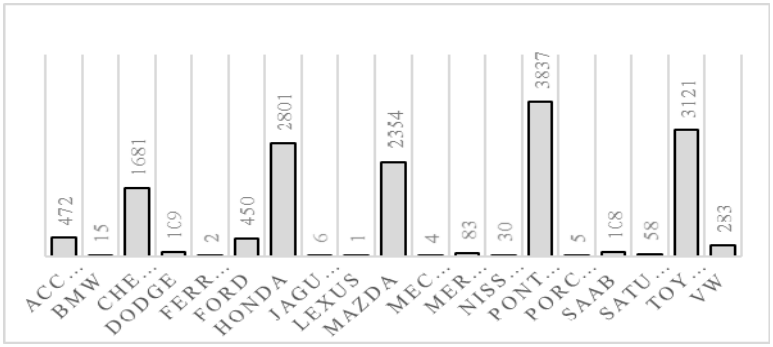
To build up the data mining models, used to analyze the data from the automobile insurance dataset and to identify the relations between different properties of the insurance policy holders in order to determine groups who are more susceptible to make a fraud, we used the *SQL Server Analysis Service.* It is an analytical processing and data mining tool in SQL Server, used to develop business intelligence, data warehousing and data mining applications. In this case the multidimensional database was used to organize data and express relations between attributes. There are two reasons we choose the SSAS. The first one is the price of the tool. We think that the current price of this tool makes it accessible for all the insurance companies and broker agencies. The second reason we choose this tool is the ease of use. This makes the tool available for the general users and not requires a software engineering background.

Data description

The dataset used for data mining was provided by Angoss Knowledge Seeker software with 15420 cases of car insurance policies from the United States of America. The dataset also contains the information if a case was a fraud or not. The data set contains 11338 cases logged between 1994 and 1995 and 4082 cases logged in 1996, however we won't analyze the time of these accidents. The main focus is to determine the relations between a fraudulent case and the characteristics of the policy holder. The car characteristics that was involved in the accident also could be important. The fraudulent cases represent 6% of the total cases. A detailed presentation of the attributes from the original dataset can be found in the appendix. However, in the next part we present the distribution of the most important indicators.

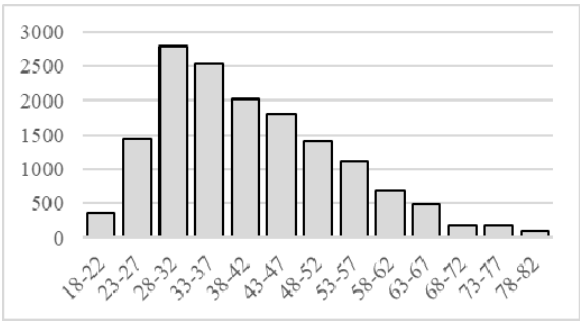
Figure 1. presents the statistical representation of the manufacturers. We can observe that Honda, Mazda, Pontiac and Toyota represent the majority of cases.

Figure 1. Manufacturers distribution



Further analyzing the dataset, we can see that the majority of cases happens in the urban area with 13822 cases. Figure 2 shows how the age of the policy holders are distributed.

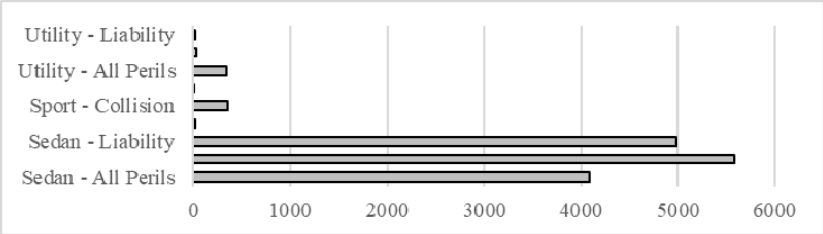
Figure 2. Age distribution of policy holders



The next attribute we want to analyze is the marital status. We would also like to know if this attribute has any effect on fraud probability. The numbers are

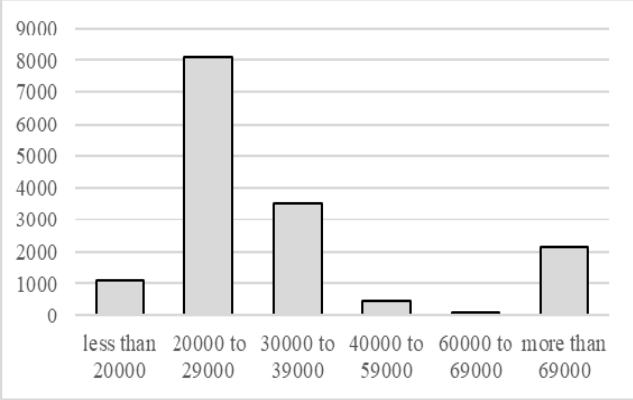
the following: 10625 married, 4684 single, 76 divorced and 35 widow policy holders. Another attribute that could have huge impact on fraud is the policy type. Figure 3 presents the distribution on policy types.

Figure 3. Distribution of policy types



Finally, the category and the price of the vehicle are important. The dataset contains 9671 sedan, 5358 sport and 391 utility type vehicles. The vehicle price distribution is presenting on figure 4.

Figure 4. Vehicle prices distribution



4. The applied data mining algorithms

In this section we present the methods that we use for data mining, on the real word automobile insurance fraud dataset. The data mining methods we used are the following: decision trees, naïve Bayes and neural networks. They are general and widely used models however their accuracy can vary based on the structure of data. Based on our literature review, these models could have the best performance in case of automobile insurance.

Before applying the above-mentioned methods, we needed to define some structure in SSAS which contains the input variables. In our first approach we used a structure which contains 24 from the previously presented 33 attributes. This mining structure was named as fraud characteristics mining structure. The PolicyNumber, Deductible, Days_Policy_Accident, Days_Policy_Claim, AgentType, NumberOfSuppliments, AddressChange_Claim, Year, BasePolicy attributes were

not analyzed, because in our case, they are unique (ex. PolicyNumber), irrelevant (ex. Year), or not commonly used (ex. AgentType) attributes.
Based on figure 5 and figure 6, we can observe that by using decision trees, the two most important fraud indicators are Fault and Policy Type.

Figure 5. Distribution of Probability in case Fault = 'Policy Holder' and Policy Type = 'Sedan-Collision'

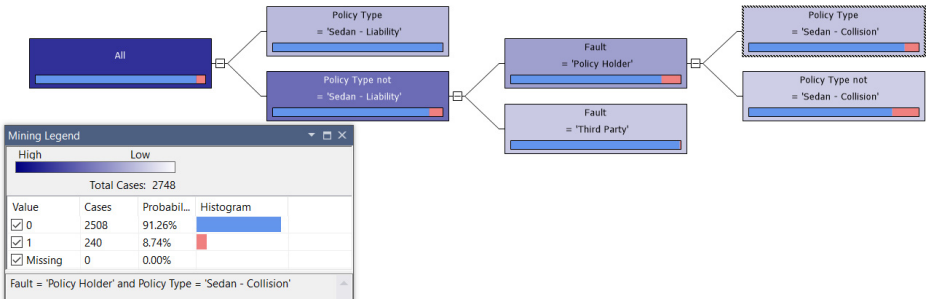
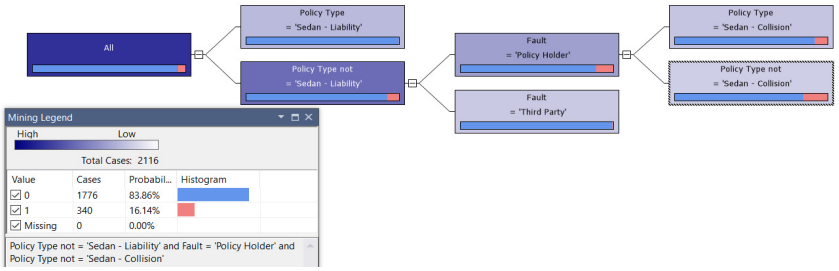


Figure 6. Distribution of probability in case Policy Type is not 'Sedan Collision' and 'Sedan Liability' and Fault = 'Policy Holder'



Using the Naïve Bayes algorithm on the fraud characteristics mining structure, we get three important fraud indicators: Fault = 'Policy Holder', Vehicle Category = 'Sedan', Policy Type = 'Sedan – All Perils' or 'Sedan - Collision'. On the figure 7 we have these indicators ordered by their impact on the probability of fraud.

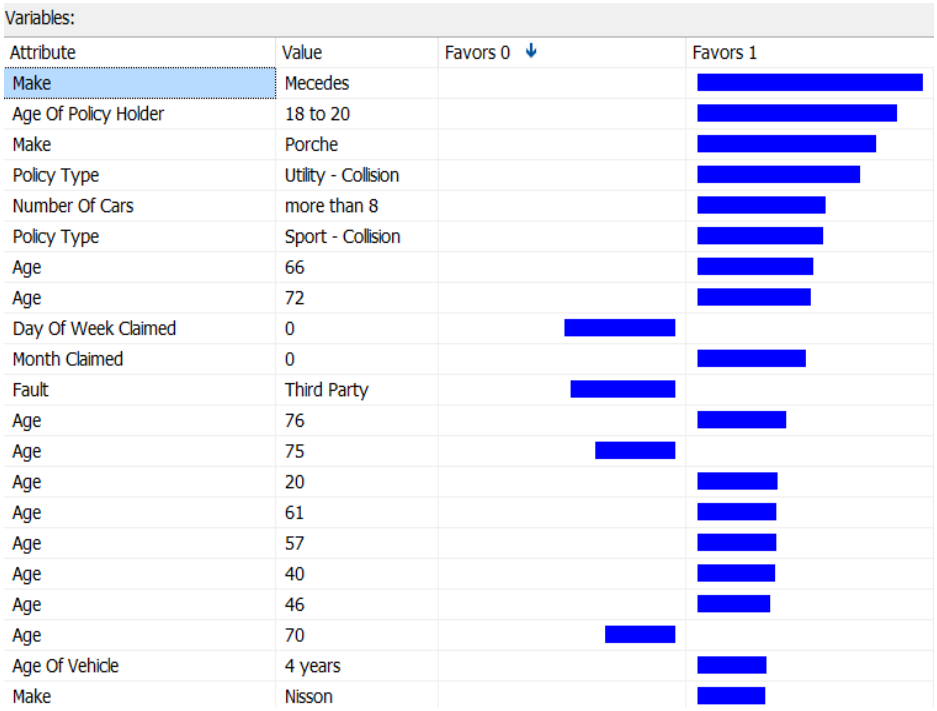
Figure 7. Key indicators and their values ordered by their impact on the probability of fraud

Characteristics for 1

Attributes	Values	Probability
Fault	Policy Holder	
Vehicle Category	Sedan	
Policy Type	Sedan - All Perils	
Policy Type	Sedan - Collision	
Vehicle Category	Sport	
Policy Type	Sport - Collision	
Vehicle Category	Utility	
Policy Type	Utility - All Perils	
Fault	Third Party	
Policy Type	Sedan - Liability	

By applying the Neural Networks algorithm, we received a list of input parameters (see figure 8) and their values ordered by their impact on the probability of fraud. On the figure can be observed that the highest probability of fraud was determined in case of the Mercedes vehicles. The same conclusion cannot be drawn in the case of the Decision Trees and Naïve Bayes algorithms, as the number of observations which have Mercedes as manufacturer in our dataset are quite small, compared to the other vehicle manufacturers. So, the results gained by using the Neural Networks algorithm are really important, however the big picture - the overall number of policies recorded and the share of Mercedes from it - couldn't be forgotten. Finally, on the figure is also visible the disadvantage of this algorithm, especially that it does not group these attributes as the other two methods.

Figure 8. Neural Network results on fraud characteristics mining structure



After the initial result, obtained from the mining structure with 24 attributes, we went into more details. To further analyze the data and find more key fraud indicators, we divided the attributes in four different structures (as recommended by Weisberg, 1998 or Belhadji, 2000) which are the following:

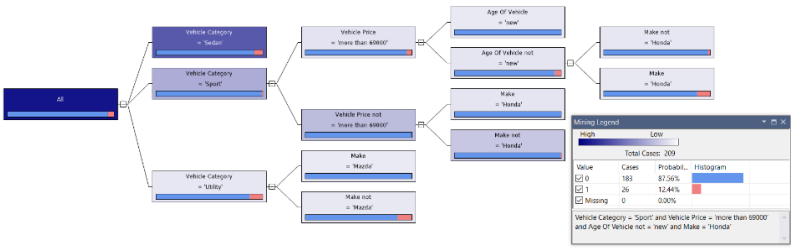
- car characteristics: Make, VehicleCategory, VehiclePrice, AgeOfVehicle
- accident characteristics: Month, WeekOfMonth, DayOfWeek, AccidentArea, Fault, PoliceReportFiled, WitnessPresent
- driver characteristics: Sex, MaritalStatus, Age, DriverRating, PastNumberOfClaims

- claimant characteristics: DayOfWeekClaimed, MonthClaimed, WeekOfMonthClaimed, PolicyType, RepNumber, AgeOfPolicyHolder, NumberOfCars
  Using these mining structures, we applied the same three algorithms.

Car Characteristics Mining Structure

By applying the decision tree algorithm on the car characteristics structure, we got a more detailed result of how the vehicle category and the manufacturer of the vehicle influence the fraud probability. On figure 9 can be observed that Vehicle Category 'Sedan' and 'Utility' are representing the majority of frauds. In the case of 'Utility' vehicles when the manufacturer is not 'Mazda' the probability of fraud is 13.90% almost twice compared to the base probability. In case of 'Sport' vehicles if the manufacturer is Honda and the vehicle is considered 'new' the probability of fraud is 12.44%.

Figure 9. Decision Tree applied on Car Characteristics mining structure



Using the Naïve Bayes algorithm, we only receive the distribution of the vehicle categories ordered by their impact on the probability (see figure 10).

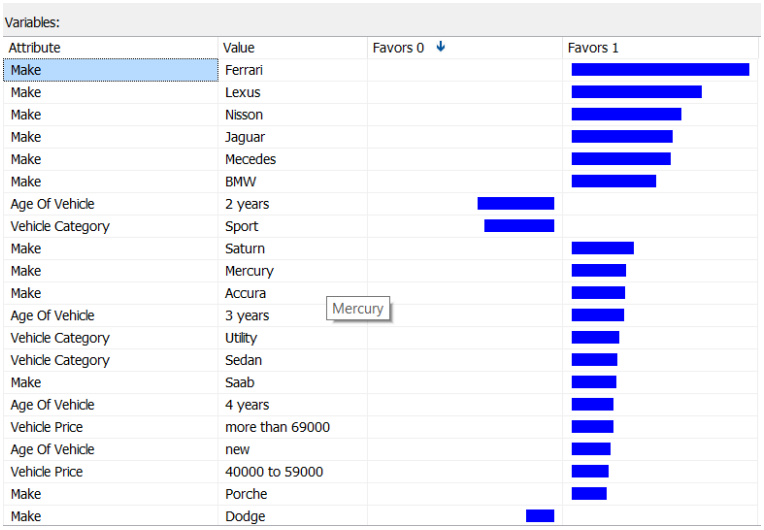
Figure 10. Naive Bayes applied on Car Characteristics

Characteristics for 1

Attributes	Values	Probability
Vehicle Category	Sedan	
Vehicle Category	Sport	
Vehicle Category	Utility	

The Neural Network results are showing us that more luxurious cars have a higher impact on the probability of fraud (see figure 11). The other key indicators of fraud are Age of Vehicle, Vehicle Category and Vehicle Price. For example, if the price of the vehicle is higher than 69000$ there is a higher chance of fraud.

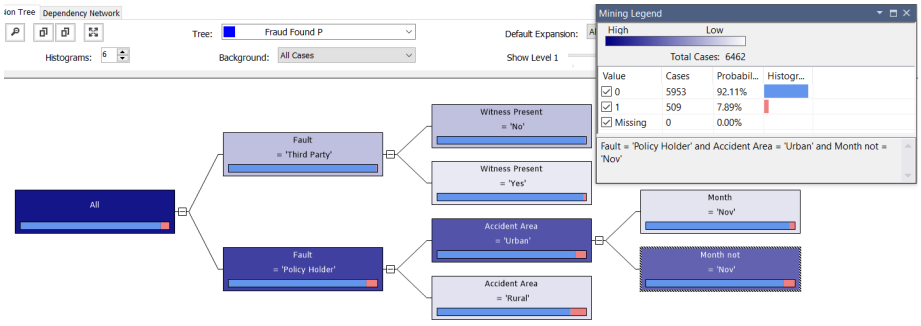
Figure 11. Neural Network applied on Car Characteristics



Accident Characteristics Mining Structure

When applying the Decision Tree on the accident characteristics' structure we receive a segmentation based on Fault, Witness Present and Accident Area (see figure 12). The most important indicator is the Fault. If the value of this attribute is 'Policy Holder' there is a higher fraud probability. Further going down on this path, can be observed, that fraud probability in case of 'Rural' accident area is higher than 'Urban', 11.05% compared to 7.54%.

Figure 12. Decision Tree applied on accident characteristics structure



On figure 13 can be obtained that Naïve Bayes identified one indicator (Fault) as important attribute which influences the fraud probability.

Figure 13. Naive Bayes result on Accident Characteristics

Characteristics for 1

Attributes	Values	Probability
Fault	Policy Holder	
Fault	Third Party	

Using the Neural Networks algorithm, of the figure 14 can be observed that if the Fault is 'Third Party' or Month of the accident is July, the likelihood of fraud decreases.

Figure 14. Neural Network results on accident characteristics

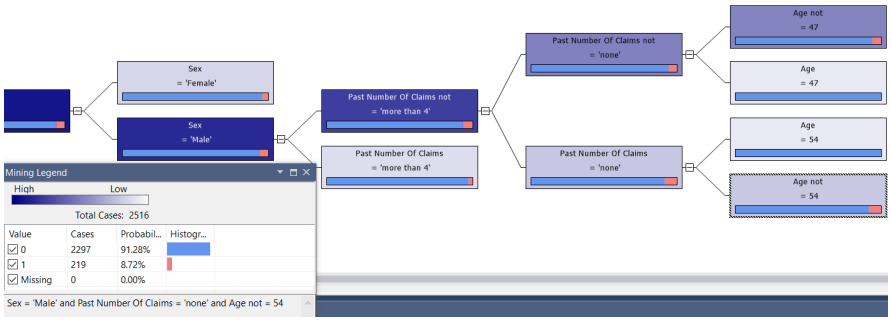
Variables:

Attribute	Value	Favors 0	Favors 1
Fault	Third Party		
Witness Present	Yes		
Fault	Policy Holder		
Accident Area	Rural		
Month	Jul		
Day Of Week	Sunday		
Month	Feb		
Day Of Week	Saturday		
Month	Jan		
Month	Dec		
Month	Mar		
Police Report Filed	Yes		
Month	Apr		
Week Of Month	2		
Month	Oct		
Month	Sep		

Driver Characteristics Structure

As shown of figure 15, the Decision Tree algorithm has identified 3 key indicators, Sex, Past Number of Claims and Age, which influence the fraud probability. For example, can be observed that if the driver is 'Male', the Past Number of Claims is less than 4, and the age differs form 54, the probability of fraud is 8.72%.

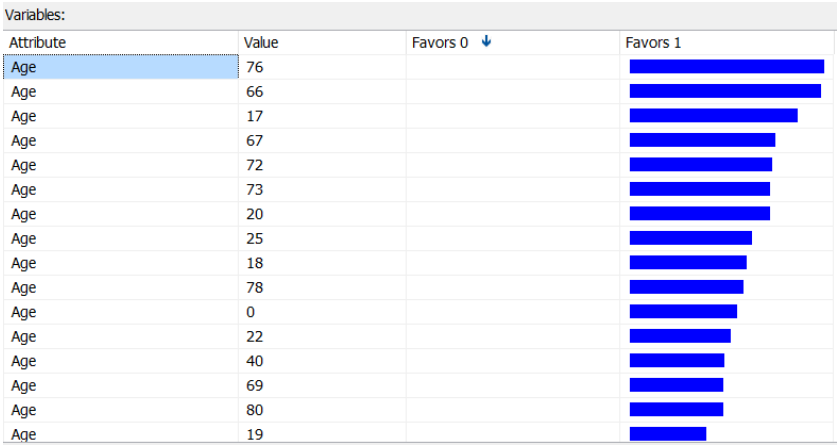
Figure 15. Decision Tree results on Driver Characteristics



Using the driver characteristics structure, the Naïve Bayes was not able to identify any impactful indicators.

Based on the Neural Network algorithm (see figure 16) can be stated that, if the age of the driver is between 16 and 25 or between 60 and 80, the probability that a fraud will happen is higher.

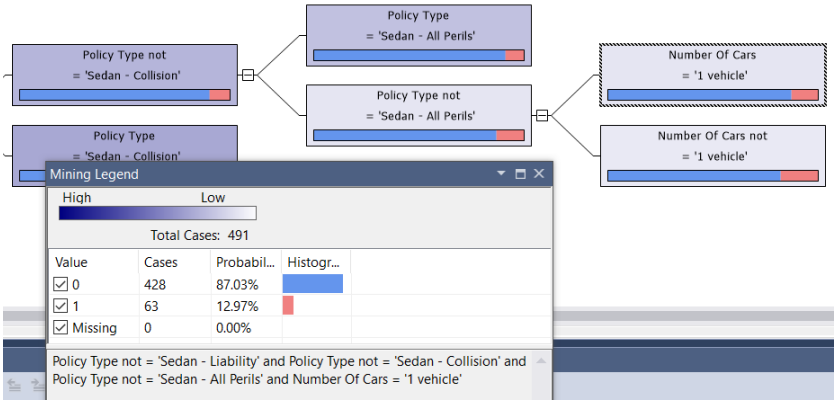
Figure 16. Neural Network results on Driver Characteristics structure



Claimant Characteristics Mining Structure

By using the Decision Tree on the claimant characteristics mining structure, we obtain a tree (see figure 17) that is based on the Policy Type and Number of Cars input parameters and their values. We can identify them as the key indicators of fraud in this case.

Figure 17. Decision Trees applied on Claimant Characteristics structure



The Naïve Bayes algorithm (see figure 18) identified Policy Type, as the most important indicator and ordered their values based on their impact on the probability of fraud.

Figure 18. Naive Bayes applied on Claimant Characteristics

Characteristics for 1

Attributes	Values	Probability
Policy Type	Sedan - Collision	
Policy Type	Sedan - All Perils	
Policy Type	Sport - Collision	
Policy Type	Sedan - Liability	
Policy Type	Utility - All Perils	

Finally, the results of the Neural Network on the accident characteristics mining structure indicate an interesting correlation between the month the accident takes place and between the month the claims take place. More exactly, if the accident happened in the month of July and the month claimed is also July, these values favor that a fraud will not happen. Another interesting result is that Rep Number 6 and 10 appears also as a value that favors fraud. The most important indicators in these results are Policy Type, Age of Policy Holder, Number of Cars, Month Claimed and Rep Number.

Figure 19. Neural Network results in case of Claimant Characteristics

Variables:

Attribute	Value	Favors 0	Favors 1
Month Claimed	0		
Day Of Week Claimed	0		
Policy Type	Utility - All Perils		
Policy Type	Sport - Collision		
Policy Type	Sedan - Liability		
Policy Type	Utility - Collision		
Age Of Policy Holder	16 to 17		
Number Of Cars	more than 8		
Policy Type	Sedan - All Perils		
Age Of Policy Holder	18 to 20		
Policy Type	Sport - All Perils		
Rep Number	6		
Age Of Policy Holder	21 to 25		
Number Of Cars	3 to 4		
Policy Type	Sport - Liability		
Month Claimed	Jul		
Month Claimed	Feb		
Day Of Week Claimed	Saturday		
Rep Number	10		
Month Claimed	May		
Month Claimed	Mar		

Comparison of the applied algorithms

After applying the decision tree, naïve Bayes and neural network methods on the five mining structure, we compare the performance of this algorithms. To do this, we used a built-in function from the SSAS. This function – known as the Lift Chart – compares the performance of each used algorithms. In the next five figures can be observed the performance of each algorithms on each mining structure.

Figure 20. Performance of the decision tree, naïve Bayes and neural network algorithms on the initial mining structure

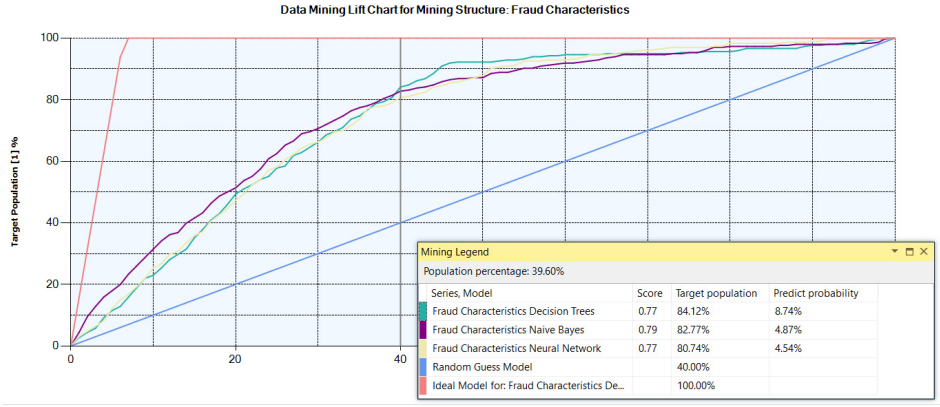


Figure 21. Performance of the decision tree, naïve Bayes and neural network algorithms on the car characteristics mining structure

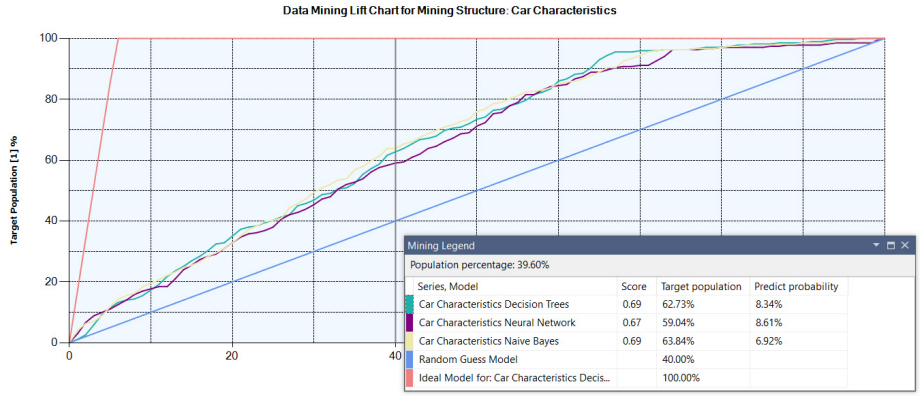


Figure 22. Performance of the decision tree, naïve Bayes and neural network algorithms on the accident characteristics mining structure

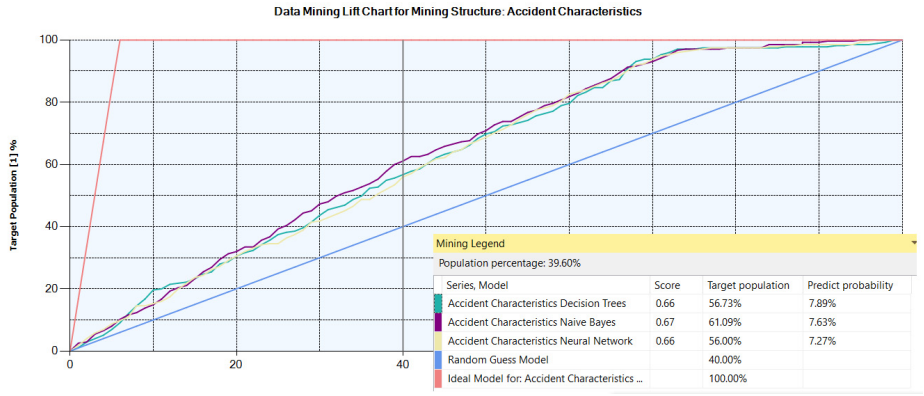


Figure 23. Performance of the decision tree, naïve Bayes and neural network algorithms on the driver characteristics mining structure

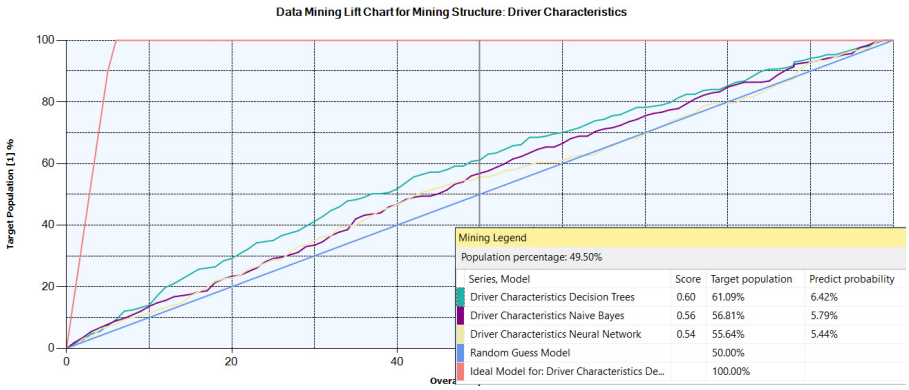
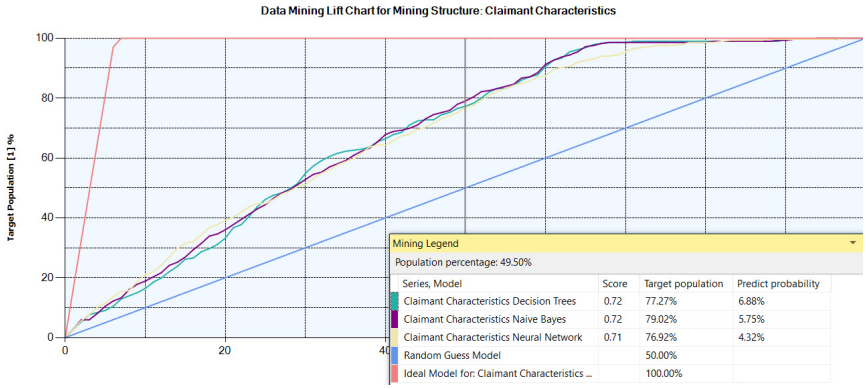


Figure 24. Performance of the decision tree, naïve Bayes and neural network algorithms on the claimant characteristics mining structure



Overall, it can be said, that in our case the decision tree algorithm has a better performance than other algorithms.

5. Discussion and conclusion

By using data mining methods for identifying key fraud indicators on a real-world automobile insurance dataset, we obtained connections between our input attributes (such as age, gender, car value, etc) and insurance fraud probability. With the use of SQL Server Analysis Services we took advantage of already defined and widely recognized algorithms like decision trees, naïve Bayes and neural networks. Another advantage of using this visual tool is, the ease of use. It is not necessary to have a software engineering background; however, the understanding of the algorithms could be an advantage in the interpretation of the results. So, the first important statement of this study, could be the following: the SSAS could be an accessible tool for all the insurance companies from Romania.

In order to identify key fraud indicators, we analyzed the fraud characteristics mining structure with the decision tree, naïve bayes and neural network algorithms. We identified Policy Type, Fault and Vehicle Category as key indicators. The results of the neural network gave us a better insight on our dataset and point out the need of a deeper analysis. Therefore, we created four separate mining structures, where we focused on the characteristics of the driver, accident, claimant and car, separately. By analyzing the characteristics of an accident, we identified two more key indicators: accident area and month of the accident. In case of the driver characteristics mining structure the tree most important indicators where: sex, past number of claims and age. The result obtained from the car characteristics mining structure showed that the key indicators are vehicle category, make, age of vehicle and vehicle price.

While examining the performance of models the results suggest that decision tree and neural network are more suitable than naïve Bayes. These results are in accordance with the statement of Hassan and Abraham, that decision tree-based algorithms perform better than others. However, based on our opinion the best conclusion can be drawn if we combine the decision tree and neural network results.

Limitations and further research

One of the main limitations of obtaining more fraud indicators were the small number of cases that we could analyze in this database. The data mining algorithms are designed to deal with millions (or hundred millions) of observations. They need huge amount of data for training purpose. By using 24 input attributes, the research would require a bigger number of cases.

Another limitation of the research is caused by the unbalanced type of the dataset. The related literature recommends some workarounds, but unfortunately most of them can't be implemented in SSAS. We think that this limitation could be resolve be using another (more complex of insurance specific) analytical tool.

Finally, the dataset is "old" and comes from the American market so it's less relevant in case of Romania, but as far as we know doesn't exist a Romanian dataset.

Acknowledgements

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APPENDIX

Appendix 1: Attributes of the dataset

No	Attributes name	Description
1	Month	The month in which the accident took place
2	WeekOfMonth	The week of the month
3	DayOfWeek	The day of the week
4	Make	The car manufacturer
5	AccidentArea	Accident aria, rural or urban
6	DayOfWeekClaimed	The claim day of the week
7	MonthClaimed	The month of the claim
8	WeekOfMonthClaimed	The week of the claim
9	Sex	Gender, male or female
10	MaritalStatus	Marital Status
11	Age	Age of policy holder
12	Fault	Policy holder or third party
13	PolicyType	Type of the policy
14	VehicleCategory	Sedan, sport or utility
15	VehiclePrice	Price of the vehicle with 6 categories represented in dollars
16	FraudFound_P	Fraud
17	PolicyNumber	Unique identification number of the policy
18	RepNumber	Id of the person who process the claim
19	Deductible	Amount to be deducted before claim disbursement
20	DriverRating	Driving experience with 4 categories
21	Days_Policy_Accident	Days left in policy when accident happened
22	Days_Policy_Claim	Days left in policy when claim was filed
23	PastNumberOfClaims	Past number of claims
24	AgeOfVehicle	Vehicle's age with 8 categories
25	AgeOfPolicyHolder	Policy holder's age with 9 categories
26	PoliceReportFiled	Yes or no
27	WitnessPresent	Yes or no
28	AgentType	Internal or external
29	NumberOfSuppliments	Number of supplements
30	AddressChange_Claim	No of times change of address requested
31	NumberOfCars	Number of cars
32	Year	1994, 1995 and 1996
33	BasePolicy	All perils, collision or liability

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INDUSTRIAL SECTOR GROWTH, MACROECONOMIC PERFORMANCE, AND CORRUPTION IN THE SUB SAHARA AFRICA

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Abstract
The study investigates the impacts of macroeconomic performance and corruption on the industrial growth of the SSA. The industrial sector is seen as the engine of the economic development of any country and hence policies that will promote the growth of the sector cannot be over emphasized. The study investigated effects of macroeconomic variables such as exchange rate, economic growth, inflation rate and unemployment rate as measures of economic performance in the SSA on the industrial sector growth. Also quality of institutions effects on industrial sector is investigated using control of corruption as proxy. The preliminary diagnostic results show that Panel Auto-Regressive Distributed Lags P-ARDL is appropriate for the estimation and the results show that both macroeconomic performance and corruption have significant impacts of the industrial sector growth in SSA. However, an exchange rate that will encourage domestic production, minimum inflation, and unemployment rates, will guarantee sustainable growth in the industrial sector, while tightening grip on control of corruption.

JEL Classification: E02, H11, L16;

Keywords: Industrial sector growth, Macroeconomic performance, Corruption.

1. Introduction

Over the years economic researchers have postulated different theories which explain the rate at which developing economies can catch up with the developed ones. An important theory in this regard is the Rowstos stages of economic development (Freckleton, Wright, Craigwell, 2012). The summary of this idea is that industrialization remains the major factor that can bridge the gap between the underdeveloped and the developed economies. Consequently, efforts of developing countries across the globe have been geared towards improving their industries in order to achieve sustainable economic development that will enable them to catch up with the developed countries.

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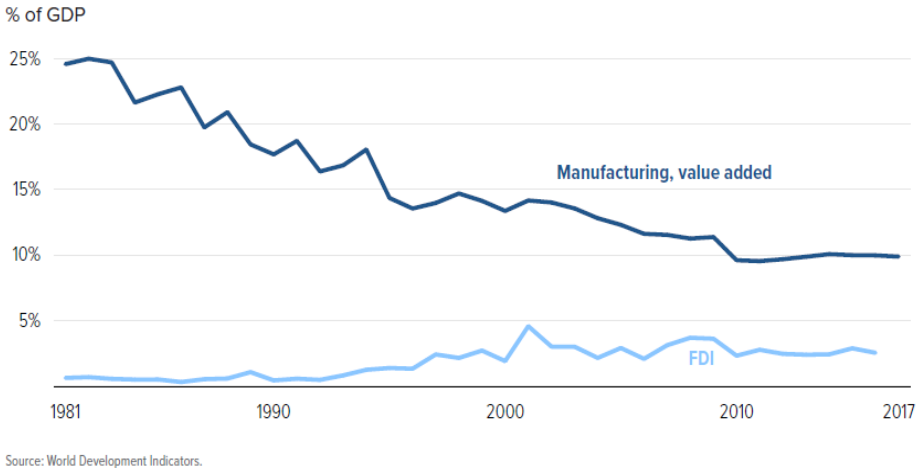
The Sub Sahara African SSA Countries remains one of the regions in the world with the least industrial growth and this has been affecting the economic development of the regions for quite a long time (Szeftel, 2000). The growth of the industrial sector in the SSA remains a priority to many international development agencies and this is has led to increase in funding to the sector from various international donor agencies (UNDP, 2015). For instance the Africa development Bank (AfDB, 2012) embarked on aggressive funding of the industrial sectors of the SSA by raising the fund to the industrial sector by about 45%. In addition, individual institutions of the countries in the SSA have been implementing policies that aimed at promoting the growth of the industrial sector by establishments of various local agencies and formulation of policies.

Notwithstanding, the performance of the industrial sector of the SSA over the years has left more to be desired going by the available statistics. For instance the manufacturing sector which is the most important sub sector of the industrial sector have been witnessing a downward trend in terms of growth in recent times. Figure 1 shows the declining trend of manufacturing value added and Foreign Direct investment FDI in the SSA. This is an indication that the problem of the industrial sector in the SSA requires a more pragmatic approach that goes beyond policy formulation. It is very evident from the figure that between 1981 and 2017, the manufacturing sector which is the fulcrum of the industrial sector has been witnessing a downward trend in terms of growth and value added during these periods.

Figure 1. Manufacturing Value Added and FDI trend in the SSA



Source: World Development Indicators

However, the irony f the issue is that the falling trend has continued unabated and this has further compounded the problems of the sector in the SSA. Generally, the economic performances of the SSA countries in terms of their economic growth, unemployment rate, inflation and exchange rate among other macroeconomic indicators have also been suggested by some authors as the likely causes of the unimpressive performance of the industrial sector of the SSA sub

region (Omoteso and Mobolaji, 2014). The fact behind this position is that good macroeconomic outlook portends good horizon for the industrial sector to thrive. However, this assertion remains within the premise of opinions without any empirical back up.

Again, some other school of thought argued that the quality of the institutions of the SSA is the major challenge that is facing the SSA industrial sector. They concluded that the rise in the cases of corruption and the weakness in control of corruption by the institutions of the SSA remain the greatest challenge to the industrial sector because it prevents creation of enabling environment that will enable investment to thrive.

These two schools of thought have remained dominants in the research on the industrial sector in the SSA however, little or no research work exist on investigation of the relationship between corruption, macroeconomic performance and the industrial sector growth in the SSA. Although, there are some studies on individual countries but none of them focused on the sub region as a whole. This could have served as a policy guide for regional, sub regional and international development agencies such as AFDB, World Bank and IMF among others who always look for sub regional findings to direct and redirect their areas of priorities in various sub regions, SSA inclusive.

Empirical literatures show that previous studies have been focusing more on the relationship between corruption and economic growth without giving attention to the industrial sector (Asiedu, Freeman, 2009). In addition the only study that investigated the impact of corruption on industrial sector was on Zimbabwe and not the SSA (Makochekanwa, 2009).

Consequently, this study investigates the impacts of macroeconomic performance and corruption on the industrial sector growth of the SSA sub region between 1995 and 2016. The remaining parts of the empirical studies are divided to the literature review, methodology, results ‘discussion, and conclusions.

2. Literature review

Makochekanwa (2014) investigated the impact of corruption on firms’ growth in Zimbabwe, using firm level data from 599 Zimbabwean firms which were surveyed in 2011 by the World Bank. The study empirically investigated the effects of corruption on firm level economic activities in the case of firms operating in manufacturing, retail and services sectors. The research made use of econometrics techniques. The results from the combined sample indicate that both capital stock and labour are positively related to a firm's level of productivity. Considering the three variables of our main interest, national corruption was the only variable which was found to be positively and significantly related to a firm's productivity. This implies that, in the case of Zimbabwean firms, national corruption enhances their productivity. Overall, the result supports the hypothesis that corruption is a 'grease' which lubricates the ‘squeaky wheels' of bureaucratic, rigid administration and inefficient governments particularly those of the developing world. The results showed that across the three sectors, capital-labour ratio is significant and positive as expected from economic theory.

Zafar (2017) investigated the growing relationship between China and Sub Sahara Africa in terms of trade investment and macroeconomic development. It

was a pure desk reseach that made use of descriptive statistics of historical data that shows the relationship between the two regions on macroeconomic performance, industrialization and trade. According to the author, the emergence of China as economic super power in the world in recent times had many effects on the global economy as a whole. This development made China to be more relevant in industrialization progress of the SSA. The improvement in trade between China and the SSA has led to increase in importation of oil from Sudan and Angola and timber form Timber from Central Africa. The effect of China relationship with SSA improved industrialization and trade in SSA to the tune of about 50 billion USD. However, the negative implication of this relationship is the inevitable effect of Dutch Disease that this can bring since China only import primary product from SSA. Therefore the relationship between SSA has both negative and positive implications on the SSA and the industrial sector of the Sub region as a whole.

Ahmad and Ali (2010) investigated the impact of corruption on the banking industry in some developed and developing countries. The investigated the impact of corruption on financial sector development. A panel of 38 countries was used in the study between 1995 and 2005. The countries included in the study comprised both developed and developing countries. System Generalized Method of Moments SYS-GMM was used. The result of the analysis indicated that corruption had adverse effect on financial sector development. Consequently, the study recommended effective control of corruption in order to have a developed financial sector.

Omotesho and Mobolaji (2014) examined the impact of governance indices (especially control of corruption) on economic growth in some selected Sub-Saharan African (SSA) countries for the period 2002 to 2009. Specifically, the study attempted to assess whether governance reforms (especially those relating to control of corruption) have any impact on the economic growth in SSA countries. It also examines whether simultaneous policy reforms have any impact on economic growth in the region. The governance indices used in this study were drawn from the PRS Group and the World Governance Indicators for the period of 2002 to 2009 while the real GDP per capita growth data were obtained from the World Bank Database. The study applied both random and fixed effect using maximum likelihood estimation to examine the effect of political stability and institutional quality on economic growth of forty-seven SSA countries. The result from the analysis show that both political stability and institutional quality have significant positive impact on economic growth of the sub region. On the contrary, corruption control failed to have significant impact on economic growth. It is recommended that governments in the SSA should intensify efforts on control of corruption and improve of their rule of law and political stability in order to achieve sustainable economic growth.

Asiedu and Freeman (2009) examined the Effect of Corruption on Investment Growth: Evidence from Firms in Latin America, Sub-Saharan Africa, and Transition Countries. According to them, the impact of corruption on investment has three common features: they employed country-level data on investment and corruption is measured at the country level. Data for countries from several regions are also pooled together. The study used firm-level data on investment and measured corruption at the firm and country level, and allowed the effect of corruption to vary by region. The dependent variable is firms' investment growth and the study employed six measures of corruption from four different sources—two firm-level measures and four country-level measures. The study found that the effect of corruption on

investments varies significantly across regions: corruption has a negative and significant effect on investment growth for firms in Transition countries but has no significant impact for firms in Latin America and Sub-Saharan Africa. Furthermore, for Transition countries, corruption is the most important determinant of investment.

From the empirical literature reviewed, it is obvious that there are no studies specifically on the relationship between industrial sector growth, institutional quality (corruption) and macroeconomic performance of SSA. The study of Asiedu and Freeman (2009); Omotesho and Mobolaji (2014) which are the closest did not focus on industrial sector growth. The only study that investigated the industrial growth was based on Zimbabwe and did not consider the influence of macroeconomic variables. This study will contribute to filling these identified gaps.

3. Methodology

This aspect of the paper discusses the research methods in terms of the theoretical underpinnings, model specification, estimating techniques as well as the sources of data.

Model specification

(Romer, 1988) in his modification of Arrow's seminar work on the economies of learning by doing pointed out that investment in knowledge (experience) has strong linkage with increase in productivity. According to (Romer, 1988), the indexes of experience by cumulative investment follow the following production function.

$$Y_{it} = F(K_{it}, A(t)L_{it}) \quad (1)$$

Where Y_{it} is the output of firm i , A(t) is the stock of knowledge of firm i at period t, K_{it} and L_{it} are the capital and labour of the firm at period t. Romer pointed out that labour is more productive due to accumulation of knowledge which also depends on experience. However experience is a function of past investment. Consequently the growth rate of output of the firm can be written as a function of indexes of experience by cumulative investment as follows:

$$G(t) = \int_{-\infty}^{t} I(v)dv = k(t). \quad (2)$$

Where G (t) is the growth rate of the output of the firm, I (v) dv is the indexes of the cumulative investment which is equal to capital stock k (t).

Again, in the definition of money demand function using the ISLM model, Romer(1996) postulated a relationship between some macroeconomic variables such as inflation, money growth and interest rate as follows;

$$\frac{M}{P} = L(r, y). \quad (3)$$

This can be written in linear form thus:

$$y = 1/\alpha\left(\frac{M}{P}\right) + \alpha/\beta(r). \quad (4)$$

Where $1/\alpha$ and α/β are elasticities of macroeconomic variables respectively.

Substituting equation 3 into 4 leads to:

$$G(t) = 1/\alpha\left(\frac{M}{P}\right) + \alpha/\beta(r)\ldots \quad (5)$$

Thus, the growth rate of a firm can be presented as a function of these macroeconomic variables

Our model is a modification of equation 5. In our attempt to study the relationship between industrial sector growth, corruption and other macroeconomic variables in SSA, variables such as control of corruption and other macroeconomic variables such as inflation rate, exchange rate, economic growth and unemployment rate are included independent variables while industrial sector growth in the SSA is the dependent variable.

More explicitly the model is expressed thus

$$INDGR_{i,t} = \beta GDPGR_{i,t} + \alpha UMP_{i,t} + \alpha EXR_{i,t} + \delta INF_{i,t} + \alpha CORR_{i,t} + \sigma_{i,t} \quad (6)$$

Where INDGR is the growth rate of industrial sector for country i at time *t*. GDPGR is the economic growth for country i at time *t*. UMP is the unemployment rate for country i at time *t*. EXR is the exchange rate for country i at time *t*. INF is inflation for country i at time *t*. CORR is control of corruption for country i at time *t* and $\mu_{i,t}$ represents stochastic variable.

Method of analysis

Panel-ARDL (Auto-regressive Distributed Lags)

The estimating techniques embraced for the study is the Auto-Regressive Distributed Lags in Panel form. This approach is selected because of its less stringent conditions in terms of stationarity test, which allows for variables that are integration of order zero. Again, it will enable us split the effects of these independent variables on the industrial sector growth to both long run and short run effects hence we will able to examine if the effect of macroeconomic performance of the SSA as well as their control of corruption have sustainable effects of the growth of the industrial sector.

The Panel-ARDL is utilized accommodates both the I(0) and I(1) variables whereas, error correction based panel cointegration only accommodates I(1) variables. The ARDL model is appropriate to run the short-run and long-run relationships (**Baltagi, 1995)**.

Sources of data

Data required for the study are sourced form secondary sources. Precisely, the Global Economic World Bank data remains an important source through which data on all the variables used for the study are sourced.

4. Results and discussion

This aspect of the research work presents and discusses the results from all the analysis explained in the methodology. According to the methodology, the model to be estimated is mainly on the effects of macroeconomic performances and corruption on the growth of the industrial sector in the Sub Sahara Africa countries SSA.

Panel Unit Root Test for the SSA

Ascertaining the order of integration of the variables used in the panel model is very germane to the selection of the estimating technique to be used for our analysis. Therefore, the usual practice is to use more than one method of panel unit root test to be able to confirm the level of consistency in the panel unit root test (Maddala Kim, 1998). In this study, the Im Peresan and Shin (2003), IPS, and the Augmented Dickey Fuller, ADF tests are used for the panel unit root test. The results are presented in table I.

The results show that all the variables used in the analysis are integration of both order one and zero I(1) and I(0).

Based on the foregoing, Panel Auto-regressive Distributed Lag, ARDL which is another estimating technique that permits variables that are stationary at levels to be used in the analysis is employed. As explained in the methodology, Panel ARDL emphasizes that none of the variables should have order of integration greater than one, in other words both variables that are I(1) and I(0) are acceptable.

Table 1. Panel Unit Root Test for the SSA

	IPS unit root test		ADF-Fisher Chi-square unit root test	
Variables	t* Statistics	Order of integration	t* Statistics	Order of integration
CORR	2.03749**	I(0)	315.585***	I(1)
EXR	1.84323**	I(1)	171.007***	I(1)
ECGR	2.08218***	I(1)	177.357***	I(1)
INDGR	INDGR ***	I(1)	84.7924***	I(1)
INF	4.79503***	I(0)	103.123**	I(0)
UEMP	5.59182***	I(1)	117.160***	I(1)

Statistical significance at 1%(***), 5%(**), 10%(*)
Source: Authors' computation

Panel ARDL for the SSA

Estimating Panel ARDL require three steps; first is the assessment of panel cointegration and the second one is the Panel ARDL model estimation.

Panel cointegration test

The panel cointegration test is to confirm or reject the hypothesis that there is long run relationship among industrial sector growth, macroeconomic performance and corruption in the SSA.

As stated in the above table, applying the Pedroni residual cointegration under the trend assumption: shows that, out of the eleven probability outcomes, nine of the probability outcomes result show that they are significant at 5% which implies that there exist a long run relationship among the variables examined.

Table 2. Pedroni Residual Cointegration Test

Pedroni Residual Cointegration Test				
Alternative hypothesis: common AR coefs. (within-dimension)				
			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	1.397034	**0.0812**	0.982919	**0.1628**
Panel rho-Statistic	-1.882326	**0.0299**	-1.828705	**0.0337**
Panel PP-Statistic	-4.303880	**0.0000**	-4.855980	**0.0000**
Panel ADF-Statistic	-4.219383	**0.0000**	-4.795135	**0.0000**
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	-1.693827	**0.0451**		
Group PP-Statistic	-5.459773	**0.0000**		
Group ADF-Statistic	-5.830899	**0.0000**		

Source: Author's Computation

Panel ARDL estimation

After the confirmation of cointegration the Panel ARDL regression is next. This is where the relationships among the variables is analyzed. The ARDL method breaks the relationship into both long run and short run relationships. The results are presented in tables 3 and 4 for long and short run relationships respectively.

Table 3. ARDL regression, Long run relationship

Selected Model: ARDL(2, 2, 2, 2, 2, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
	Long Run Equation			
GDPGR	5.027474	0.663370	7.578685	0.0000
UMP	-17.76855	1.600396	-11.10260	0.0000
EXR	0.300928	0.034213	8.795669	0.0000
INF	-7.000964	0.839623	-8.338227	0.0000
CORR	14.72507	6.596403	2.232288	0.0264

Table 4. ARDL regression, Short run relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.309947	0.001668	-185.8538	0.0000
D(INDGR(-1))	-1.890648	0.031470	-60.07813	0.0000
D(GDPGR)	1.143838	0.049050	23.32006	0.0002
D(GDPGR(-1))	1.903286	0.043077	44.18323	0.0000
D(UMP)	11.85770	1.476852	8.029038	0.0040
D(UMP(-1))	19.01727	3.145181	6.046479	0.0091
D(EXR)	0.129254	0.000130	995.5844	0.0000
D(EXR(-1))	-0.131741	0.000163	-810.0594	0.0000
D(INF)	-0.976225	0.010991	-88.81950	0.0000
D(CORR)	14.49076	4.109147	3.526464	0.0387
D(CORR(-1))	13.02973	2.451035	5.316012	0.0130
C	-35.47479	10.64932	-3.331179	0.0447

Tables 3 and 4 explain the long and short run relationships between industrial sector growth, macroeconomic performance and corruption in the SSA. The results show that both macroeconomic variables and corruption have significant impacts on industrial sector growth in the SSA. Macroeconomic performance is captured by unemployment rate, economic growth, inflation rate and exchange rate.

Firstly, the results show that there exist a positive relationship between economic growth and industrial sector growth in the SSA in both long run and short run period. The coefficients are 5.027474 and 1.143838 for both long and short run periods respectively. The implication of the result is that the rate of industrial sector growth in the SSA is significantly affected by the economic growth of the SSA countries both in the long and short run periods. Therefore as the economy of a country is growing the industrial sector is influenced positively and if the economic growth is falling also the industrial sector growth also falls. The result is similar to the findings of Makochekanwa (2014) where economic growth of Zimambwe had positive and significant impact of the industrial growth.

Secondly, unemployment rate coefficient is -17.76855 in the long run and it is significant. The implication is that there is an inverse relationship between unemployment rate and industrial sector growth in the long run. The implication is that a rise in unemployment rate will bring an fall in the industrial sector growth in the long run. However, the coefficient is 11.85770 that is positive and significant in the short run. This simply implies that industrial sectors may witness a rise in their growth despite a rise in the unemployment rate but this can only occur in the short run. Therefore to achieve a sustainable industrial sector growth which is shown by the long run equation, unemployment rate should be kept at the minimum. The result is similar to the findings of (Van Rijckeghem Weder, 2001) who concluded that unemployment creates social menace for the industrial growth.

Thirdly, the exchange rate coefficients in both the long and short run equation are 0.300928 and 0.129254 respectively. The results show that there exist a direct of positive relationship between industrial sector growth and the exchange rate of the SSA. The implication of the result is that currency devaluation will bring a significant rise in the industrial sector growth. The implication is that a rise in exchange rate which means depreciation of the currency will made import more expensive and thus encouraging export and promoting domestic production which will in turn lead to rise in the industrial sector growth. This is evident in some studies like (Rajan Subramanian, 2011), where Dutch disease is a manifestation of this kind of relationship between the industrial sector and the exchange rate

The coefficient of inflation is -7.000964 and -0.976225 in both long run and short run periods. This simply shows that there is an inverse relationship between industrial sector growth and inflation in the SSA. The implication is that a rise in inflation rate will bring a significant fall in the level of industrial sector growth in the SSA. The result conforms to the apriori expectation because, rise I inflation connotes a rise in the cost of production. Therefore if the cost of production is rising as a result of increase in the inflation rate, this will bring a significant decrease in the industrial sector growth of the SSA. This relationship was also confirmed by Loungani Sheets (1997(Loungani Sheets, 1997).

Lastly, corruption control is used as proxy for corruption. Positive or rising value shows good corruption control while falling all negative value shows otherwise. The results show that for both periods the coefficients of corruption

control are 14.72507 and 14.49076 respectively. Consequently, it indicates that a good control of corruption will bring about a rise in the industrial sector growth of the SSA. This is an indication that institutional quality is a major challenge to the industrial sector of the SSA. The higher quality the institution of the SSA is the larger growth that will be witnessed in the industrial sector. The study of (Zafar, 2007) is one of the studies in which the same relationship was obtained although it was a descriptive analysis.

The error correction term coefficient is -0.309947 and it is significant at 1%. The implication is that the estimated panel model of the SSA is a good one in that error in the past can be corrected at present with about 30% feedback. This is because the error correction term is rightly signed and will be able to resto the equilibrium whenever there is a disequilibrium is the level of industrial sector growth witnessed by adjusting the independent variables.

Diagnostic test

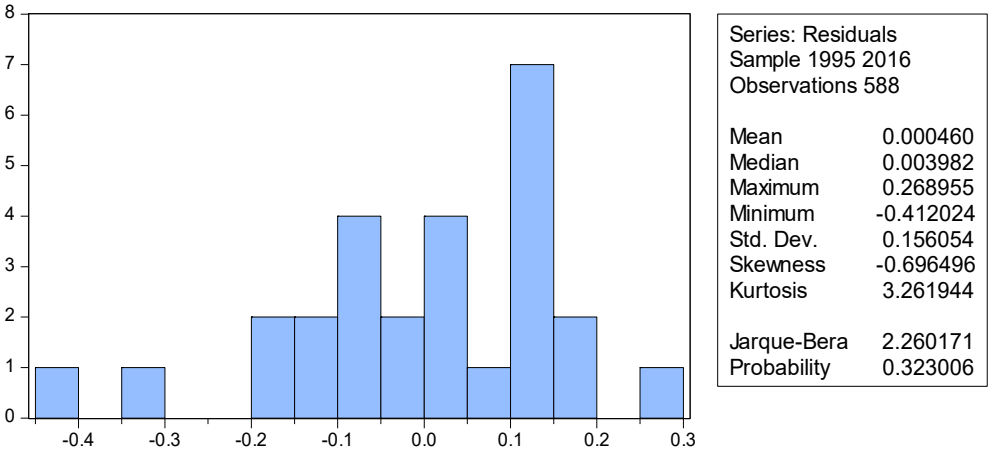
Some test are carried out to verify the reliability if the parameter estimates obtained in the estimated panel model for the SSA.

Table 5. Model selection Croteria

Model Selection Criteria Table					
Model	LogL	AIC*	BIC	HQ	Specification
4	-794.695794	4.056056	6.691461	5.085114	ARDL(2, 2, 2, 2, 2, 2)
2	-1002.348660	4.697674	7.116681	5.642234	ARDL(1, 2, 2, 2, 2, 2)
1	-1277.730161	5.281179	6.834599	5.887750	ARDL(1, 1, 1, 1, 1, 1)
3	-1272.897337	5.363919	7.133736	6.054987	ARDL(2, 1, 1, 1, 1, 1)

The result on table 5 shows that the best model with the highest log likelihood value as selected via the AIC criteria is selected for the estimation. Therefore ARDL(2, 2, 2, 2, 2, 2) is the best model selected for the analysis.

Figure 1. Normality test



Another diagnostic test carried out is the normality test. The result show that the JARQUE_BERA statistics value of 2.260171 is not significant at 5% therefore the hypothesis that the estimated model residual is not normally distributed is rejected. Therefore we conclude that the model estimated for the relationship between industrial sector growth, macroeconomic performance and corruption in the SSA has a residual that conforms to normal distribution hence the result is reliable

Conclusions and recommendations

Findings from the study have led to some germane conclusions about the relationship between industrial sector growth, macroeconomic performance and corruption in the SSA.

Firstly, it can be concluded from the findings that economic growth of countries in SSA is very important to the growth of their industrial sectors. Countries with stunted economic growth will definitely witnessed poor industrial growth. Again, currency devaluation has been shown as a way of promoting the industrial sector growth in the SSA. This conclusion conforms to the findings from the studies of Omoteso and Mobolaji (2014). However, this comes with some caveats like inflation rate must be kept at bay so that high cost of production will not leads to rise in the domestic goods prices which can further encourage importation.

Secondly, rising unemployment rate has been shown from the study as inimical to the growth of the industrial sector. Notwithstanding, findings from the study indicate that this may be positive in the short run as industries might be able to cut cost as a result of reduction in workers which will aggravate unemployment rate but this situation will not lead to a sustained industrial growth rate as shown by the result. It is concluded from the study that a sustainable industrial growth increase can be guaranteed via reduction in the level of unemployment rate. Again, as part of the conclusion from the study it was found out that the industrial sector of an economy depends of the growth of the economy. This explains the reason why industrial sector of developed economies are strong and developed.

Finally, the study has shown that poor institutional quality will also inhibit industrial growth. This finding is similar to (Omoteso Ishola Mobolaji, 2014). Poor handling of corruption by institutors in the SSA has been shown t have a significant negative impact of the growth of the industrial sector. It is recommended that institutions in SSA should embrace policies that will ensure importation is discouraged through exchange rate policy, keeping minimum levels of inflation and unemployment rate couple with effective control of corruption in order to ensure sustainable industrial growth in the sub region.

However, the study limitation is in the area of the panel data analysis it is believed that individual assessment of each country in the SSA can offer more insight into what individual country is presenting in terms of the relationship between their industrial sector and corruption. This is called a disaggregated approach. Consequently further studies on this topic can consider using disaggregated approach and examine if there will be some differences in their results.

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THE INFLATION-GROWTH RELATIONSHIP IN SSA INFLATION-TARGETING COUNTRIES

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Abstract
This paper investigates the relationship between inflation and economic growth for South Africa and Ghana using quarterly empirical data collected from 2001 to 2016 applied to the quantile regression method. For our full sample estimates we find that inflation is positively related with growth in Ghana at high inflation levels whilst inflation in South Africa exerts its least adverse effects at high inflation levels. However, when particularly focusing on the post-crisis period, we find inflation exerts negative effects at all levels of inflation for both countries with inflation having its least adverse effects at high levels for Ghana and at moderate levels for South Arica. Based on these findings bear important implications for inflation targeting frameworks adopted by Central Banks in both countries.

JEL Classification: C32, C51, E31, E52, O40;

Keywords: Inflation; Economic Growth; quantile regression; Inflation targeting; South Africa; Ghana; Sub-Saharan Africa (SSA).

1. Introduction

The effects of inflation on economic growth represent one of the most studied phenomenons in the macroeconomic paradigm. The importance of inflation as a macroeconomic variable in the literature arises from its ability to reflect the efficiency and effectiveness of monetary policy in influencing the macroeconomy. In particular, the extent to which inflation affects output growth or economic performance has proven to be a topic of substantial relevance to any Central Bank concerned with price stability. From a policy perspective, attainment of a low and stable inflation can be unambiguously described as the fundamental objective of monetary policy authorities worldwide since it is widely believed that inflation exerts

adverse effects on macroeconomic variables like investment, output and productivity. Generally, the available empirical evidence, tends to, more often than not, lend support to the notion that inflation is detrimental to economic growth and that price stability, defined as a low and stable inflation rate, is at least an important condition for the attainment of economic growth. At the broadest level, the literature clearly supports the notion that well-run and well-governed Central Banks with strong and efficient productive structures tend to simultaneously exhibit both low inflation rates and high economic growth.

Since 1990, when the Bank of New Zealand became the first Central Bank to adopt an inflation targeting framework, the number of Central Banks operating under a similar policy framework has steadily increased. Within the design of an inflation targeting framework, monetary authorities aim to keep inflation below a defined level; reduce bank support for government deficits; help manage the country's integration into world trade and financial markets and vigorously reduce the influence of democratic social and political forces on Central Bank policy (Phiri, 2016a). Moreover the inflation targeting framework has proven to be virtuous in curbing inflation and lowering inflation volatility in addition to being built on fundamental pillars such as credibility, transparency, independence and accountability (Phiri, 2016b). Despite these noteworthy attributes of inflation targeting frameworks, the popularity of the inflation targeting framework appears to be restricted to industrialized economies especially when considering that only two Central Banks in African countries have adopted fully-fledged inflation targeting frameworks, those being, the South African and Ghanaian monetary authorities.

The global financial crisis of 2007-2008 as orchestrated by the bursting of the US housing market bubble in August 2007 eventually led to the collapse of the US financial sector following the closure of large US investment firms which ultimately exacerbated into the global financial crisis via contagion effects. As a result of the financial crisis, the world economy faced an economic downturn in which world GDP growth rates plummeted from over 4 percent in early 2007 to below 0.5 percent in late 2008 whereas inflation rates steadily increased from 4.4 percent in 2006 to over 9 percent in 2009. Since then most economies worldwide are still attempting to recuperate from the aftermath of the sub-prime crisis both in terms of lowering inflation rates as well as improving economic growth levels. In wake of the global financial crisis, the inflation targeting regime has come under considerable scrutiny and criticism since it is widely argued/believed that the framework strictly focuses on the attainment of low and stable inflation through manipulation of short term interest rates at the expense other competing macroeconomic objectives such as financial and macroeconomic stability.

From an academic point of view, it is highly probable that the global financial crisis has caused a shift in the inflation-growth relationship previous established by other authors. For instance, recent empirical evidence has revealed that the global financial crisis caused changes in monetary relationships such as the exchange rate pass-through dynamics (Kabundi and Mbelu, 2016), between the US Federal fund rate and stock market volatility (Phiri, 2016c) as well as in inflation persistence (Phiri, 2017). However, up-to-date, there exists no empirical attempts, to the best of our knowledge, which has looked as the possibility of the global financial crisis causing a change in the inflation-growth relationship. Highly motivated by this hiatus, in this present study, we examine the relationship between inflation and economic growth for

South Africa and Ghana in light of the global financial crisis. We consider these countries since they are representative of inflation targeting countries in the Sub-Saharan Africa (SSA) region. Therefore a study of this nature is more relevant towards monetary authorities in these countries since the obtained empirical results can be used as benchmark for directly evaluating the appropriateness of inflation targets towards economic growth in these economies. We also note that previous studies may have unable to perform a similar analysis based on the unavailability of a suitable length of time series data. However, we are currently celebrating the 10th anniversary since the infamous sub-prime crisis hence ensuring that quarterly data would be sufficient enough to carry out an analysis of this magnitude.

Of recent there has been a increasing dissatisfaction with the conventional view of a linear relationship between inflation and growth, and the literature is rather advocating for a non-monotonic relationship (Chu et al. (2017), Oikawa and Ueda (2018), Ibarra and Trupkin (2016), Ndoricimpa (2017), Omay et al. (2018)). In our study, we make consideration of a nonlinear inflation-growth relationship for South Africa and Ghana by methodologically relying on the quantile regression framework of Koenker and Bassett (1978). In differing from other nonlinear econometric models found in the literature such as the threshold autoregressive (TAR), the smooth transition regression (STR) and the Markov Switching (M-S) models which tend to impose a singular or double threshold within the estimated regressions, quantile regression provide the advantage of examining the effects the dependent variable at many points of conditional distribution thus providing a more complete picture of relationship between the target variable and its covariates. Moreover, unlike other econometric models which can be inefficient if the standard errors are highly non-normal, quantile regressions are more robust to non-normal errors and outliers (Koenker and Bassett, 1978). As part and parcel of our empirical strategy, we perform our quantile regressions on two data sets, the first corresponding to the pre-crisis period and the second corresponding to the post-crisis period.

Against this background, we structure the remainder of the paper as follows. The next section provides an overview of inflation targeting in South Africa and Ghana. The third section of the paper presents the literature review whilst the fourth section puts the data and methodology into perspective. The empirical analysis is carried in section five of the paper whereas the paper is concluded in the sixth section of the paper.

2. An overview of inflation targeting in South Africa and Ghana

As previously mentioned, the Bank of New Zealand became the first Central Bank to adopt an inflation targeting regime in 1990, with other Central Banks in Chile (1990), Canada (1991), Israel (1991), the UK (1992), Sweden (1993), Finland (1993) and Austria (1994) following closely in pursuit. However, the popularity of the inflation targeting framework gained prominence subsequent to the Asian financial crisis of 1997-1998 and in particular following the recommendations of the International Monetary Fund (IMF) in their advocacy for monetary authorities worldwide to adopt a combination of flexible exchange rates and inflation targets (Phiri, 2012). Notably, it was shortly after this period that the South African Reserve Bank (SARB) become the first African economy to announce the intention to adopt an inflation targeting framework as an official monetary policy mandate in 2000 whilst the Bank of

Ghana (BOG) undertook such a decision in 2002. Nevertheless, the SARB began to official implement inflation targeting in February 2002 whereas the BOG decided to do so in May 2007 barely months before the infamous bankruptcy filing of the Lehman Brothers which was a catalyst factor in the ensuing global financial crisis.

Inflation targeting frameworks as adopted by both the SARB and the BOG are guided by statutory mandates and in particular the SARB act No. 90 of 1989 as well as the BOG Act 612 (2002), respectively. Prior to adopting inflation targeting frameworks both Central Banks were dependent on money supply growth guidelines which were deemed ineffective due to the weakened relationship between inflation and money supply. Consequentially, both Central Banks gradually developed the institutional capacity necessary for implementing the inflation targeting regime, and during this transition period these Central Banks moved away from the traditional monetary policy framework that was focused on targeting a monetary aggregate, towards analysing a broader range of indicator to assess its monetary stance (Kovanen, 2011). However, subsequent to the decision to directly target inflation, both Central Banks abandoned their partial or informal inflation target regimes in favour of formal inflation targets of 3 to 6 percent as set by the SARB, whilst the BOG adopted a set target of 8 percent which is allowed to deviate 2 percent above or below this target point (i.e. therefore establishing an inflation targeting range of between 6 and 10 percent). For the case of both Central Banks, the appointed monetary policy committee (MPC) acts in conjunction with the Ministry of Finance in setting the inflation targets and ultimately bears the responsibility for ensuring that inflation remains within the set target and does so via the manipulation of short term interest rates i.e. repurchase or repo rate.

3. Literature review

3.1. Exposition of the theoretical review

Dynamic growth models were formally introduced into the literature mainly as a courtesy of Harrod (1939) and Domar (1946). Dissatisfied with the conventional systematic thinking associated with static theory, the authors developed a dynamic system of economic axioms in which *certain forces* are operating steadily to increase or decrease certain magnitudes in the system (Solow, 1965). Equilibrium in such a system is not static but can rather be thought of as a moving equilibrium. Along such equilibrium, growth occurs such that it leaves all parties satisfied, that is, they will choose to remain on the same path of output, *ceteris paribus.* However, growth along such a path is highly unstable as compared to the case of static growth. In the latter case, equilibrium is assumed to exhibit self-correcting tendencies in the sense that any diversion from static equilibrium will, through certain adjustment processes, lead back to equilibrium. In the case of a moving equilibrium, departure from the equilibrium does not necessarily result in '*invisible forces*' causing a return to equilibrium as dictated by the laws of demand and supply but could result in a further diversion from the established equilibrium growth path (Mankiw, Romer and Weil, 1992).

The next paradigm into the analysis of dynamic long-run economic growth came courtesy of neo-classical economists whom have seemed to have dominated the exposition. A major contribution by neo-classical growth economics is the distinction of different growth factors; namely capital accumulation or gross fixed

capital formation, growth in the labour force and technological progress as well as being able to incorporate functioning pricing systems into dynamic economic growth models (Gokal and Hanif, 2004). The introduction of these pricing systems allowed for the analysis of the effects of inflation on economic growth using monetary assets and capital accumulation as the primary channel mechanism between inflation and real activity in the economic (Frenkel and Rodriguez, 1975). In a separate seminar papers, Mundell (1963) and Tobin (1965) incorporated the role of money within the neo-classical growth model by designating money as a store of value. Within the aforementioned models, inflation causes individuals to substitute away from physical money to interest earning monetary assets which leads to higher capital accumulation and higher economic growth hence insinuating a positive inflation-growth relationship.

By relying on a monetary optimizing growth model in which infinite lived agents optimize an intertemporal utility function, Sidrauski (1967) challenged Tobin's (1965) proposition by insinuating that increase in money supply and hence inflation will increase per capita money balances whilst exerting no effect on per capita consumption and capital accumulation levels. This non-effect of an increase of money supply on capital accumulation and ultimately economic growth is what is more popularly dubbed as the superneutrality hypothesis of money. Stockman (1981) developed a neo-classical model with inelastic labour supply in which money is a complimentary to capital and is held to satisfy a cash-in-advance constraint. Inflation, which is induced by an increase in money supply growth, exerts a long-run negative effect on economic growth if money held satisfies the cash-in-advance constraints, otherwise money is superneutral. Greenwood and Huffman (1987) as well as Cooley and Hansen (1989) extended on Stockman (1981) by assuming there exists a labour-leisure choice/trade-off in which inflation increase leisure (non-productive) which ultimately drives down economic growth although Greenwood and Huffman (1987) find a direct effect from leisure to economic growth whereas Cooley and Hansen (1989) establish an indirect channel via capital accumulation.

Following the neoclassical era, came the construction of a class of growth models in which the key determinants of growth were endogenous to the model. These new growth theories or endogenous growth models introduced a new analytical paradigm that departed in a significant way from neo-classical economies. In particular, economic growth within endogenous growth models through factors within the production process such as; economies of scale, increasing returns or induced technological change; in contrast to exogenous factors such as population growth increases (Solow, 1994). The studies of Lucas (1982), Svensson (1985) and Lucas and Stokey (1987) represent blueprint works which depict the negative effect inflation within an endogenous growth model whereby inflation acts as a tax on the return to all forms of capital and ultimately economic growth. Furthermore, these endogenous models are responsible for the emergence of dynamic nonlinear effect of inflation on growth, with the study of Gillman ad Kejak (2004) being amongst the first to depict such a nonlinear relationship in which the Tobin effect (i.e. positive inflation-growth relationship) is found at low levels, whereas at higher levels the negative Stockman effect comes into play. The models main attribute is the ability for the representative agent to choose between two competitive mechanism, money and credit and an increased use of credit such that an initial increase in marginal cost of money (i.e. inflation) causes an initial increase in the return to capital which later

turns negative hence dictating the nonlinear inflation-growth relationship. Moreover, other theoretical studies presented by Huybens and Smith (1999) and Bose (2002). Low inflation does not distort information or interfere with resource allocation and economic activity up to certain inflation threshold of which crossed, inflation aggravates the credit market through distorted flow of information.

3.2. Empirical review of associated literature

To the say the least, there has been a prolific amount of empirical evidence on the inflation-growth nexus. For the sake of brevity and relevance, we restrict our review of the associated literature to the studies which include South African and Ghanaian data in their empirical analysis, which still represents an exhaustive portion of the available empirical literature. Moreover, these studies can be conveniently disintegrated into five strands of empirical works, namely; i) panel studies inclusive of both South African and Ghanaian data ii) Panel studies which only include South African data iii) Panel studies which only include Ghanaian data iv) Country-specific South African studies v) Country-specific Ghanaian studies. The first cluster of studies are inclusive of the panel works of Fischer (1993), Sarel (1996), Bruno and Easterly (1998), Khan and Senhadji (2001), Gylfason and Herbertsson (2001), Rousseau and Wachtel (2002), Burdekin et al. (2004), Drukker et al. (2005), Li (2006), Pollin and Zhu (2006), Vaona and Schiavo (2007), Espinoza et. al. (2010), Bick (2010), Jude (2010), Mignon and Villavicencio (2011), Eggoh (2012), Kremer et. al. (2013), Mahawiya (2015), Ibarra and Trupkin (2016) and Ndoricimpa (2017). Notably most of these studies discard the notion of a linear inflation-growth relationship for the countries under investigation implying that inflation has different effects on economic growth depending on the level of inflation. Closely associated with this idea is the concept of an inflation threshold which represents the optimal level of inflation which maximizes economic growth.

In further summarizing the results of this first group of studies we observe that Fischer (1993), Barro (1995) and Bruno and Easterly (1998) find that inflation only significantly and negatively affects economic growth at very high levels of inflation (i.e. above 40 percent); Sarel (1996) estimates a specific 8 percent threshold; Khan and Senhadji (2001) find an 11-12 percent inflation threshold; Gylfason and Herbertsson (2001) 20-30 establish a percent inflation threshold; Rousseau and Wachtel (2002) find a 13-25 percent threshold; Burdekin et al. (2004) estimate the inflation threshold to lie between 20 and 30 percent; Drukker et al. (2005) find a 19.16 percent threshold; Li (2006) establishes two inflation thresholds points at 14 and 38 percent in which inflation has an insignificant effect in the lower regime and turns significantly negative in the middle regime before exhibiting diminishing marginal negative effects in the third regime; Pollin and Zhu (2006) find a 5-18 percent threshold; Vaona and Schiavo (2007) estimate a 5-6 percent inflation threshold; Espinoza et. al. (2010) find a 10 percent threshold; Bick (2010) estimate an inflation threshold at 19.16 percent; Jude (2010) finds two inflation thresholds of 9.5 and 24 percent which the adverse effects of inflation on economic growth strengthens as one moves from the lowest regime to the highest regime; Mignon and Villavicencio (2011) find a 19.6 percent inflation threshold; Eggoh (2012) finds an inflation threshold of 10-20 percent; Kremer et. al. (2013) establish a 17 percent threshold; Mahawiya (2015) find a 17.9 percent for ECOWAS countries (including

Ghana) and 14.5 percent for SADC countries (including South Africa); Ibarra and Trupkin (2016) find a 19.1 percent inflation threshold whilst Ndoricimpa (2017) estimate a 6.7 percent inflation threshold

Under the second group of studies, those being panel studies which only include South Africa in the empirical analysis, the available studies can be narrowed down to the works of Seleteng et al. (2013), Bittencourt et al. (2015), Behera and Mishra (2016) and Manamperi (2014). Note that whilst the works of Manamperi (2014), Bittencourt et al. (2015) and Behera and Mishra (2016) all assume linear empirical frameworks, on the other hand, the study of Seleteng et al. (2013) applies a nonlinear empirical framework (smooth transition regression model). In particular, Manamperi (2014) find a negative inflation-growth relationship in the short-run and no significant relationship over the long-run; Bittencourt et al. (2015) establish a long-run negative inflation-growth relationship; Behera and Mishra (2016) find a positive relationship for South Africa in the short-run which turns positive in the long-run whereas Seleteng et al. (2013) estimate an inflation threshold of 18.9 percent. Conversely, for the third group of studies which are panel studies inclusive of Ghana, the studies of Ahortor et al. (2010), Danladi (2013) and Iyke and Odhiambo (2017) are prominent examples and notably all aforementioned studies are nonlinear studies. Ahortor et al. (2010) estimate a 10 percent inflation threshold; Danladi (2013) find a 9 percent inflation threshold and Iyke and Odhiambo (2017) find a double threshold of 10.73 and 29.83 percent for Ghana where there exists a positive in first regime and second regimes and negative in third regime.

The fourth and fifth cluster of studies reviewed represent country-specific or individual studies for South Africa and Ghana, respectively. The South African country-specific studies include the linear studies of Hodge (2006); Odhiambo (2013) and Munyeka (2014) as well as the nonlinear works of Nell (2000); Phiri (2010); Leshoro (2012); Adusei (2012) and Phiri (2013). Nell (2000) finds that inflation within the singe-digit region/zone is beneficial for economic growth; Hodge (2006) establish a negative long-run inflation-growth relationship; Phiri (2010) estimates a 8 percent threshold; Leshoro (2012) finds a 4 percent threshold; Adusei (2012) finds a 7 percent threshold; Odhiambo (2013) find a negative short run and long-run inflation-growth relationship with bi-variate causality between the two variables; Phiri (2013) estimates a 3.08 percent inflation thresholds whereas Munyeka (2014) find a negative inflation-growth relationship. On the other end of the spectrum, the country-specific Ghanaian studies include the studies of Frimpong and Oteng-Abayie (2010); Quartey (2010); Marbuah (2011); Mireku (2012); Ayisi et al. (2013) and Enu et al. (2013) and notably all reviewed studies are nonlinear studies with the exception of the works of Enu et al. (2013) and Ahiakpor and Akapare (2014). Specifically, Frimpong and Oteng-Abayie (2010) estimate an 11 percent threshold; Quartey (2010) find a 22.2 percent inflation threshold; Marbuah (2011) establishes a 10 percent inflation threshold for Ghana; Mireku (2012) estimates a 9 percent inflation threshold level; and Ayisi et al. (2013) finds a 21 percent inflation threshold. On the other hand, both Enu et al. (2013) and Ahiakpor and Akapare (2014) uncover a negative and linear relationship between inflation and growth in Ghana.

4. Methodology

Empirical studies assessing the impact of inflation on economic growth typically assumes the following econometric framework:

$$Y_t = \beta X_t + e_t \quad (1)$$

Where Y_t is the per capita GDP growth rate, X_t represents a vector of explanatory variables and e_t is a well-behaved error term. We particularly specify our vector of explanatory variables as:

$$X_t = \{inf_t, inv/gdp_t, gov/gdp_t, m3/gdp_t, pop_t\} \quad (2)$$

Where inf_t is the inflation rate, inv/gdp_t is a measure of domestic investment, gov/gdp_t is a measure of government size, $m3/gdp_t$ is a measure of monetary depth and pop_t is the population variable. In further elaborating on this explanatory variable, we note firstly note that the inflation represents our main/primary explanatory variable and according to economic theory can either exert a negative or positive effect on economic growth. The second conditioning variable is the investment variable and is according to conventional growth theory is expected to exert a positive effect on economic growth. In this regard, it is well known from the Neoclassical and endogenous growth theories, that investments are the engine of economic growth. The third conditioning variable, which is government size, is regarded as having a positive effect on economic growth as is a stylized feature of Wagner's law and it's rudiment theories. The fourth variable, the monetary depth variable is and this assumption comes courtesy of Schumpeter (1912) who was among the first to theoretical hypothesize on a positive effect of financial depth on economic growth. The last conditioning variable is population growth which according to traditional growth theory should exert a positive effect on economic growth. In estimating regression (1), traditional OLS estimates can be obtained by the finding the vector β_t which minimizes the sum squares residuals (SSR) i.e.

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} (y_i - x_i^r \beta)^2 \quad (3)$$

However, as previously mentioned our empirical analysis deviates from the traditional OLS methodology and opts to apply/rely on quantile regression estimators. The quantile regression methodology is basically a straightforward extension of the mean absolute deviator (M.A.D):

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} /y_i - x_i^r \beta/] \quad (4)$$

Of which the above M.A.D. estimator can be re-specified as:

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} \tau/y_i - x_i^r \beta/ + \sum_{i \in \{i: y_i \geq x_i \beta\}} (1 - \tau)/y_i - x_i^r \beta/] \quad (5)$$

Where τ is the τth quantile and set at ½ in order to obtain the MAD estimator. The main idea behind the quantile regression estimates is to use varying values of τ bound between 0 and 1 (i.e. $\tau \in 0,1$) hence producing a cluster of regressions which traces the entire distribution of the regressor conditional on the regressand. The quantile coefficients can be interpreted as the marginal change in the regressand variable due to a marginal change in the regressor variable conditional on being on the τth quantile. In our study, we particularly employ three quantiles with intervals of 0.25 between the quantile (i.e. = 0.25, 0.50 and 0.75) hence resulting the following empirical conditional mean functions:

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} 0.25/y_i - x_i^r \beta/ + \sum_{i \in \{i: y_i \geq x_i \beta\}} 0.75/y_i - x_i^r \beta/] \quad (6)$$

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} 0.5 |y_i - x_i' \beta| + \sum_{i \in \{i: y_i \geq x_i \beta\}} 0.5 |y_i - x_i' \beta|] \quad (7)$$

$$\min_{\beta \in \mathbb{R}^k} [\sum_{i \in \{i: y_i \geq x_i \beta\}} 0.75 |y_i - x_i' \beta| + \sum_{i \in \{i: y_i \geq x_i \beta\}} 0.25 |y_i - x_i' \beta|] \quad (8)$$

Equations (5) though (8) can be solved straightforward using traditional linear programming techniques.

5. Data and empirical results

5.1. Data description and preliminary analysis

Our empirical study employs annual time series data collected from the World Bank online statistical database spanning over a 46 year period of 1970 to 2016. For the sake of empirical rigorousness, we choose to interpolate the data into quarterly data hence yielding empirical data spanning over a period of 1970:q1 to 2016:q4. In particular, our dataset consists of the annual percentage change in gross domestic product (i.e. gdp), the percentage change in consumer inflation price (i.e. inf), broad money expressed as a percentage of GDP (i.e. M3/GDP), gross domestic fixed capital expressed as a percentage of GDP (i.e. inv/gdp), government expenditure expressed as a percentage of GDP (i.e. gov/gdp), the population growth (i.e. pop) and the percentage growth in terms of trade (i.e. trade). As a preliminary step in our empirical process, we begin by examining the basic descriptive statistics of the time series variables as well as their correlation matrix for both economies as reported in Tables 1 and 2, respectively. Moreover, the time series plot for all employed time series variables are reported in Figure 1 and 2 respectively.

From the descriptive statistics we note a number of interesting statistics such as the inflation averages 30.26 and 9.37 for Ghana and South Africa, respectively, with both averages exceeding their designated inflation targets assigned by monetary authorities in both countries. Nevertheless, the computed standard deviations indicate relatively high variation for Ghanaian data over the full sample time period, whereas South African inflation appears to not be as volatile as Ghanaian inflation. We also note the low economic growth averages of 3.71 and 2.53 for Ghanaian and South African data, respectively and the growth average for the latter country is well below the 6 percent long-term target. The corresponding standard deviation for economic growth is higher than the mean for Ghana yet lower than the mean for South Africa. This observation implies that Ghanaian growth rates are more susceptible to negative values compared to South African counterpart. Also note the reported Jarque-Bera statistics which indicate a case of non-normality for a number of the time series in both countries, an observation which strengthens the case in favour of the use of quantile regression methodology.

On the other end of the spectrum, the correlation matrices for both countries mutually display negative correlations between inflation and growth, an observation consistent with conventional growth theory. However, the correlation coefficients between growth and other determinants produce contradictory results for South Africa, noticeably for the negative coefficients between economic growth and investment, government size as well as population growth. On the other hand, concerning Ghanaian data, it appears that all signs produced by correlation coefficients

between economic growth and the growth determinants remains consistent with growth theory. We also note that all correlation coefficients are bound between the values of 0.01 to 0.82 for both countries hence providing strong preliminary evidence on the absence of heteroscedasticity between the variables. We therefore proceed to present the empirical results of the quantile regression estimates.

Table 1. Summary statistics and correlation matrix for Ghanaian data

	gdp	inf	inv/gdp	gov/gdp	m3/gdp	pop	trade
mean	3.71	30.26	16.68	12.02	36.10	2.58	57.69
std. dev.	4.50	27.95	7.89	3.19	14.14	0.38	30.14
jb	29.54	65.53	3.33	9.55	1.12	2.73	2.68
p-value	0.00	0.00	0.19	0.01	0.57	0.26	0.26
gdp	1						
inf	-0.16	1					
inv/gdp	0.43	-0.51	1				
gov/gdp	0.10	-0.36	0.61	1			
m3/gdp	0.02	0.42	-0.21	-0.28	1		
pop	0.05	-0.10	-0.22	-0.46	0.03	1	
trade	0.41	-0.51	0.82	0.50	-0.18	-0.24	1

Figure 1. Time series plot for Ghana

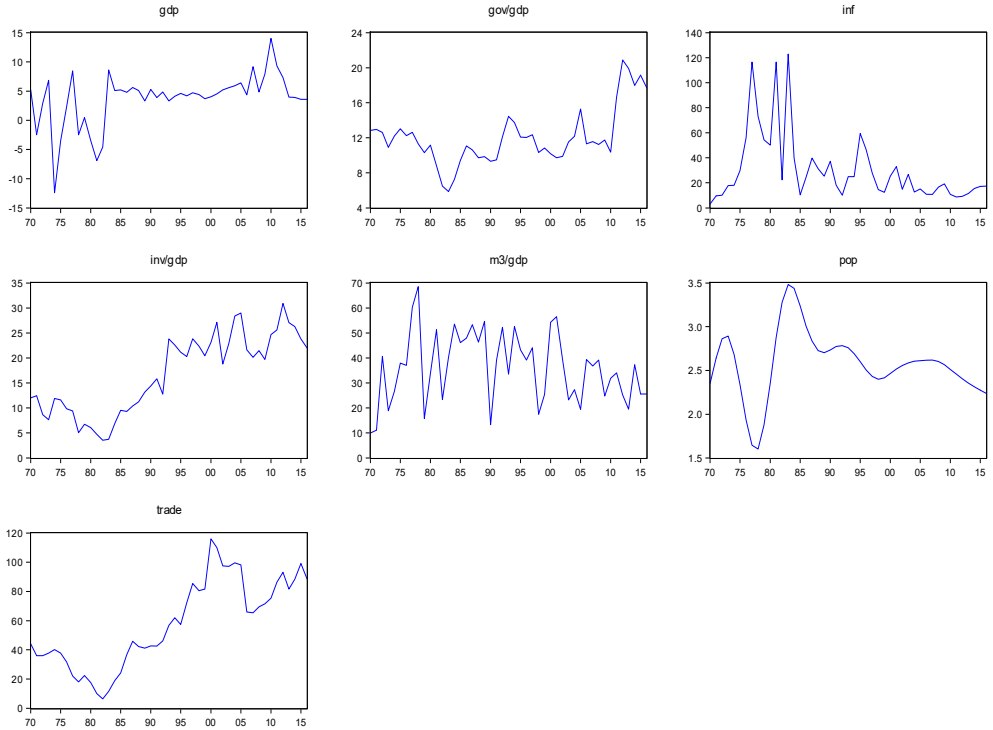
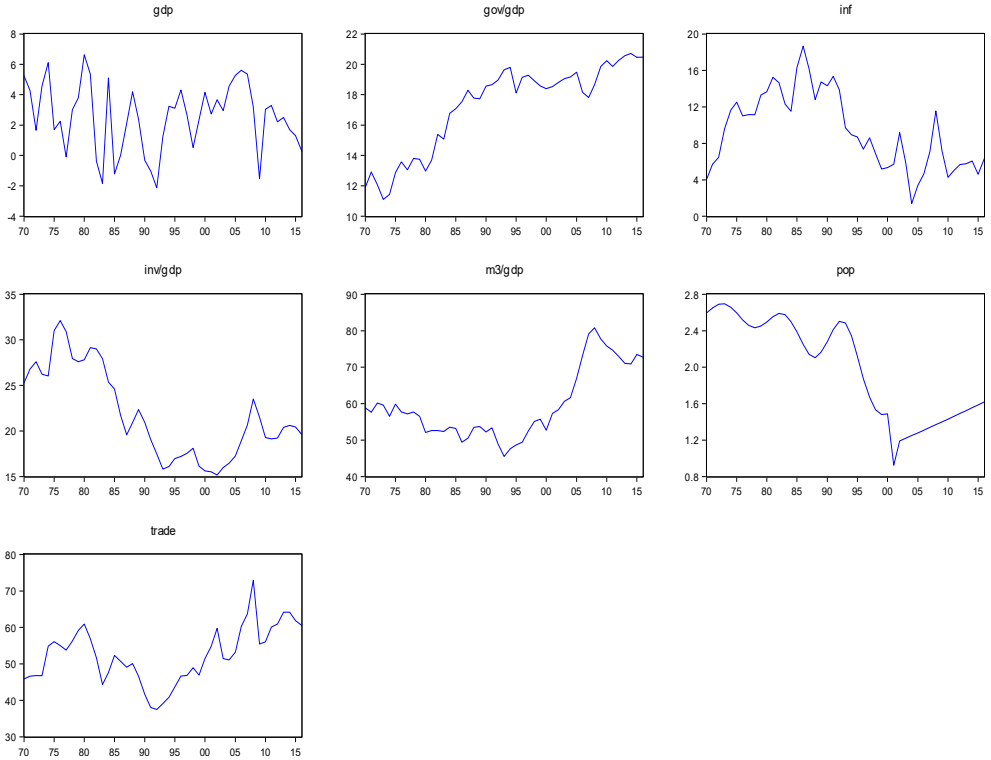


Table 2. Summary statistics and correlation matrix for South African data

	gdp	inf	inv/gdp	gov/gdp	m3/gdp	pop	trade
mean	2.53	9.37	21.79	17.21	59.43	1.99	52.40
std. dev.	2.24	4.19	4.91	2.91	9.54	0.55	7.74
jb	1.76	2.40	3.75	5.98	5.70	4.94	0.36
p-value	0.41	0.30	0.15	0.05	0.06	0.08	0.83
gdp	1						
inf	-0.33	1					
inv/gdp	-0.01	0.44	1				
gov/gdp	-0.25	-0.32	-0.82	1			
m3/gdp	0.11	-0.54	-0.05	0.30	1		
pop	-0.13	0.63	0.70	-0.73	-0.59	1	
Trade	0.29	-0.22	0.16	0.09	0.75	-0.47	1

Figure 2. Time series plot for South Africa



5.2. Regression estimates

Table 1 below reports the full sample empirical results for the quantile regressions for both Ghanaian and South African data. Starting with the results for Ghanaian data, we firstly observe that the inflation coefficient produces a negative and significant coefficient at low quantiles, insignificant at medial quantiles and

positive at high quantiles. We note a similar nonlinear finding in the study of Fisher (1993) Barro (1995) and Bruno and Easterly (1998), who all argue that inflation exerts its most adverse effect on growth at very high levels of inflation. At face value these results particularly insinuate that Ghanaian monetary authorities should consider allowing their inflation target to drift to higher levels in the interest of encouraging economic growth. However, for the investment variable, we note a positive and significant estimates at lower quantiles whereas the coefficient turns insignificant at other quantiles. We observe that this finding bridges two opposing findings that being the insignificant effect of investment on growth in Ghana as found in Ahortor et al. (2014) and Nketiah-Amponsah (2009) as well as the positive effect of investment of Ghanaian growth as reported in Frimpong and Oteng-Abayie (2010).

Concerning the monetary depth and government size variables, we find insignificant effects across all quantile distributions. This finding between the former variable and growth is quite surprising since a number of studies have theoretically and empirically advocated for a positive relationship between money supply and GDP (Khabo and Harmse, 2005). However, we are quick to note that such empirical evidence of an insignificant relationship between monetary depth and economic growth has been previously provided for in the study of Marbuah (2011) and Adu et al. (2013). However, the finding of an insignificant effect of government size on economic growth across different quantiles is puzzling finding and may plainly reflect the ineffectiveness of Ghanaian fiscal policy in stimulating domestic growth. Similar empirical evidence for Gahan has been found in the study of Adusei (2013). Finally, for the population variable, we only find a positive and statistically significant values at the 50^{th} and 75^{th} quantiles whilst for terms of trade we only obtain a positive and significant coefficient at the 50^{th} quantile. These last two findings are consistent with traditional economic theory which advocate for a positive effect of these variables on economic growth which has been previously empirical depicted for in the studies of Frimpong and Oteng-Abayie (2010) as well as Ahortor et al. (2014).

On the other end of the spectrum, from the results associated with the South African data, we first and foremost report a negative and statistically significant inflation coefficient across all quantiles with the least adverse effects of inflation being realized at moderate inflation levels (i.e. 50^{th} quantile). Note that this finding is consistent with that obtained in the work of Hodge (2006) and Adusei (2012) for similar South African data. Similarly, the domestic investment and government size variables produce negative coefficients which are significant at all critical levels across all quantile levels whilst the financial deepening variable also produces negative coefficients across all quantiles albeit being only statistically significant at high quantiles (i.e. 75^{th} quantile). We note that Phiri (2017) finds a similar negative investment-growth relationship, which is advocated to lack of Greenfiled investment and crowding out effects of public spending and budget deficits whilst the negative government spending-economic growth relationship has been previous found in Chipaumire (2014) for South African. Finally, the population and terms of trade variables produce positive coefficients and yet these are only statistically significant at a 5 percent critical level at the 25^{th} and 75^{th} quantiles for the former variable whereas the coefficients are statistically significant at all critical levels across all quantiles. For the later variable, we deem these results as being plausible since it adheres to conventional growth theory which hypothesizes that both human capital and trade openness are catalysts for economic growth.

Table 3. Full sample quantile estimates

	Ghana			South Africa		
	0.25	0.50	0.75	0.25	0.5	0.75
c	-1.27	-7.54	-4.38	14.03	16.56	16.21
	(0.81)	(0.00)***	(0.29)	(0.00)***	(0.00)***	(0.09)*
inf	-0.06	0.01	0.03	-0.21	-0.19	-0.24
	(0.00)***	(0.28)	(0.04)*	(0.00)***	(0.00)***	(0.00)***
inv/gdp	0.27	0.07	0.07	-0.65	-0.56	-0.44
	(0.03)**	(0.11)	(0.56)	(0.00)***	(0.00)***	(0.00)***
M3/gdp	0.03	-0.02	0.01	-0.04	-0.03	-0.10
	(0.33)	(0.24)	(0.93)	(0.21)	(0.40)	(0.00)***
gov/gdp	-0.17	-0.05	0.09	-0.90	-0.82	-0.65
	(0.13)	(0.31)	(0.55)	(0.00)***	(0.00)***	(0.00)***
pop	0.40	3.70	2.29	2.77	1.88	1.21
	(0.83)	(0.00)***	(0.09)*	(0.00)***	(0.06)*	(0.52)
trade	0.01	0.03	0.01	0.30	0.23	0.26
	(0.71)	(0.03)**	(0.68)	(0.00)***	(0.00)***	(0.00)***

Notes: "***", "**", "*" represent 1 percent, 5 percent and 10 percent significance levels, respectively. p-values reported in parentheses.

5.3. Sensitivity analysis

It is very possible that our empirical results obtained from our full sample estimates thus far exhibit a substantial degree of inaccuracy when primarily considering that the full sample period encompasses important structural breaks, most notably the global financial crisis of 2007 which stands out as the singular most catastrophic global financial downturn/meltdown since the great depressions. This event necessitates the need to test the sensitivity of our empirical estimates to structural breaks which is pragmatically performed by splitting the time series data for both countries into two sub-samples corresponding to the pre-crisis and post-crisis periods and provide quantile estimates for the sub-samples for both countries as reported in Tables 4 and 5, respectively below. We note that a vast majority of the estimated results obtained from the pre-crisis period are coherent with those previously obtained from the full sample estimates for both countries. However, with respect to the post-crisis period, the obtained results differ from those of the pre-crisis and full sample estimates for a number of key relationships.

For instance, during the post-crisis period in Ghana, inflation produces negative and statistically significant values across all quantiles with the least adverse effects of inflation being established at the upper quantile. We further note significant changes in the monetary depth and government size variables coefficients for Ghana as they are mutually insignificant across al quantiles in the pre-crisis and turning negative and statistically significant throughout all quantiles in the post-crisis period. Similarly the coefficients on the population growth variable for the same country are statistically significant and positive only at the 50^{th} and 75^{th} quantile in the pre-crisis whilst being significant and negative in the 25^{th} quantile in the post-crisis. Finally, we observe a slight change in the terms of trade coefficient as they become positive and statistically significant at all levels of significance across all quantile levels during the post-crisis period.

For the case of South Africa, there is not much change in the inflation-growth relationship between the pre and post crisis periods particularly concerning

the coefficient sign and statistical significance. However, we note changes in the magnitude of the relationship in which the least adverse effects of inflation on growth in the post crisis are now established at moderate levels. Similarly, for other coefficients like investment, monetary depth and government size, there is no change in the coefficient signs except the statistical significance differ between pre and post crisis periods. The only major change in coefficient sign occur with the population growth variable which turns from positive and statistically significant at all critical levels across all quantiles in the pre-crisis and turning positive and statistically significant across all quantiles in the post-crisis.

Table 4. Pre-and-post crisis quantile estimates: Ghana

	Pre-crisis			Post-crisis		
	0.25	0.50	0.75	0.25	0.50	0.75
c	2.18	-8.48	-7.75	36.96	3.47	4.88
	(0.76)	(0.00)***	(0.06)*	(0.00)***	(0.80)	(0.67)
inf	-0.06	0.02	0.04	-0.77	-0.50	-0.47
	(0.01)**	(0.20)	(0.00)***	(0.00)***	(0.00)***	(0.00)***
inv/gdp	0.39	0.04	-0.05	0.23	0.26	0.20
	(0.08)*	(0.54)	(0.45)	(0.06)*	(0.00)***	(0.10)
M3/gdp	0.03	-0.02	-0.02	-0.08	-0.10	-0.13
	(0.32)	(0.26)	(0.31)	(0.02)**	(0.00)***	(0.00)***
gov/gdp	-0.39	-0.01	0.20	-1.36	-1.21	-1.19
	(0.23)	(0.97)	(0.12)	(0.00)***	(0.00)***	(0.00)***
pop	-0.35	3.80	3.37	-7.46	4.47	4.44
	(0.88)	(0.00)***	(0.01)**	(0.05)*	(0.27)	(0.16)
trade	-0.02	0.03	0.04	0.20	0.18	0.19
	(0.62)	(0.02)**	(0.02)**	(0.00)***	(0.00)***	(0.00)***

Notes: "***", "**", "*" represent 1 percent, 5 percent and 10 percent significance levels, respectively. p-values reported in parentheses.

Table 5. Pre-and-post crisis quantile estimates: South Africa

	Pre-crisis			Post-crisis		
	0.25	0.50	0.75	0.25	0.50	0.75
c	-5.86	-7.17	-12.29	49.75	41.63	23.52
	(0.30)	(0.11)	(0.03)**	(0.00)***	(0.00)***	(0.06)*
inf	-0.37	-0.35	-0.34	-0.53	-0.52	-0.56
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
inv/gdp	-0.61	-0.54	-0.30	-0.65	-0.86	-1.48
	(0.00)***	(0.00)***	(0.20)	(0.00)***	(0.00)***	(0.00)***
M3/gdp	0.02	0.03	-0.04	-0.19	-0.10	0.10
	(0.71)	(0.36)	(0.17)	(0.00)***	(0.40)	(0.26)
gov/gdp	-0.38	-0.26	-0.01	-1.53	-1.08	-0.11
	(0.05)*	(0.04)*	(0.95)	(0.00)***	(0.05)*	(0.75)
pop	4.86	5.10	4.50	-7.85	-10.72	-16.84
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
trade	0.40	0.34	0.38	0.40	0.42	0.52
	(0.00)***	(0.00)****	(0.00)***	(0.00)***	(0.00)***	(0.00)***

Notes: "***", "**", "*" represent 1 percent, 5 percent and 10 percent significance levels, respectively. p-values reported in parentheses.

6. Conclusion

The inflation-growth relationship is one of the most studied topics within the macroeconomic paradigm and the most recent literature has deliberated for a nonlinear relationship between the two variables. In our study, we investigate this phenomenon for two SSA inflation targeting countries, Ghana and South Africa, using the quantile regression approach which essentially allows us to investigate the influence of inflation on economic growth at different quantile distributions. This aspect of our empirical analysis is of significant policy value since we are enabled to simultaneously and comparatively analyse the effects of low, moderate and high inflation distributions on economic growth for both countries. In particularly, considering that South Africa has a rather low inflation target of 3 to 6 percent whereas for Ghanaian the target is at a moderate rate of 8 percent, our empirical study, by design, is intended to shed much needed light on the suitability of these targets for both inflation targeting countries.

In essence, our empirical results point to nonlinear effects of inflation on growth in both countries although the degree and extent of nonlinearity varies between the two countries. For instance, for Ghanaian data, we observe a negative and significant effect at low inflation rates, an insignificant effect at moderate levels and significantly positive effects at high inflation rates. On the other hand, concerning South African data, we find negative and significant effects at all levels whereby this negative effect is more pronounced at moderate inflation rates and is least pronounced at low levels. The policy implications drawn from the estimates of the full sample point out to Ghanaian central Bank need to further relax their current target, whereas the South African Central Bank should stick to their current low inflation target.

However, in performing our sensitivity analysis which particularly accounts for the global financial crisis of 2007, we discover changing effects in the inflation-growth relationship more specifically for Ghanaian data in which the post-crisis analysis points to a negative relationship across all inflation distributions. However, we note that the least adverse effect of inflation on economic growth for Ghana in the post-crisis are still found to be at high levels. Therefore the policy implications still point to the Ghanaian monetary authorities benefiting from relaxing their 8 percent target to a higher range. On the other hand, we find that the negative inflation-growth relationship across all quantiles still exists for South Africa albeit the least adverse effects being found at moderate levels in the post-crisis period. Ultimately, our empirical results imply that the current inflation-target ranges pursued by both Ghanaian and South African Central Banks are impeding economic growth rates.

In drawing policy implications from our study, we find it advisable for monetary authorities in both countries having to relax their current inflation targets in the interest of improving economic growth rates especially during periods of negative economic conditions as experienced subsequent to global financial crisis. This could possibly involve widening of the lower and upper limits of the targeted inflation bands. Once these economies maintain strong productive and export sectors as well as stronger currencies, then can monetary authorities pursue much stricter inflation targets. Similar intuition can be extended to other African countries, many of which practice some ‘less stringent’ form of inflation targeting. Notwithstanding the important implications drawn herewith, one major limitation associated with our study concerns our econometric model, which does not permit us to pinpoint an exact optimal inflation level that is growth maximizing. Nevertheless, we reserve such empirical endeavours for future academic aspirations.

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